

CHAPTER 6: INFRASTRUCTURE ELEMENT

SANITARY SEWER SUB-ELEMENT

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 The City of Milton 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 City'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.

1. *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. This section describes the City's population and demographic characteristics, discusses potential funding sources and provides current and projected needs at the recommended level of service.

2. *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 City, 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 City'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 City 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 the environment located within the City of Milton.

The *Capital Improvements Element* will reflect the City'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 City and ensuring sufficient sanitary sewer services for the residents of the City of Milton.

A. 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.

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.

1. 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 Milton, 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.

2. 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.

3. 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 City have severe limitations for septic tank use. According to the Soil Conservation Service, nearly 99 percent of the soils within the City are considered to be “very limited” or “somewhat limited” 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 the City of Milton.

B. EXISTING REGULATORY FRAMEWORK

1. *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.

2. *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.

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 1972, 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 is applicable to the Sanitary Sewer Sub-Element. This goal affirms 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 city 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 implemented 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 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.

3. 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.
- 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.
- 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.

4. Local

The City's sanitary sewer service includes areas outside of the city limits including, NAS Whiting Field, East Milton, Bagdad, and Berryhill Road West. Approximately 20% of the sewer connections are located outside of the City of Milton. With an average daily flow of 1.51 MGD for the entire area and an estimated service population of 10,004, the system could support a service population of 16,442 under its maximum 2.5 MGD capacity. The population of the sewer service area is not expected to reach this number within the current planning timeframe.

C. EXISTING CONDITIONS

At the direction of the City of Milton Council, a long range plan was developed for the provision of sanitary sewer facilities in the Milton area by S/C Design Associates, Inc. and Baskerville-Donovan Engineers, Inc. The plan was developed pursuant with the requirements of Section 201 of the Federal Water Pollution control Act and is called the city of Milton, Santa Rosa County 201 Facilities Plan. The Plan was adopted by the city in April of 1978, and covered the time period to the year 2000. The plan addressed the provision of service throughout the City of Milton and nearby unincorporated areas.

For sanitary sewer planning purposes, the "201 Facilities Plan" considered four service sub-areas. These sub-areas included the City of Milton, Whiting Field N.A.S., Bagdad, and East Milton. The Navy has determined a regional facility un-advantageous for its purposes; therefore, consideration of the Whiting Field N.A.S. sub-area in a regional facility will not be necessary.

The City of Milton has provided basic sewage services to its citizens for many years, the first major program for collection and treatment of domestic sewage was undertaken in 1958. At that time the City expanded its sewage collection system to include many areas of the City not previously served. In conjunction with the expansion of the system, a sewage treatment plant was constructed and at the time it was considered to be modern and adequate. In 1965, a second major expansion into new service areas was undertaken. The trickling filter plant was also expanded in 1965 to a total capacity of 1.7 million gallons per day (MGD). Since this last major expansion, periodic extensions to the collection system and increases in the number of connections to the system have been incorporated in to the overall system. The present number of connections, which includes residential and commercial units, inside and outside the City limits, is approximately 4,900.

In 1985, the trickling filter plant was replaced. The 1985 treatment facility expansion included construction of a new treatment plant at the downtown location with a capacity of 2.5 MGD at the site of the old City of Milton Treatment facilities. The plant is designed to meet the secondary treatment standards of the Florida DEP which includes 90 percent removal of (5-day) Biological Oxygen Demand and total Suspended Solids (TSS). The plant is also capable of providing biological nitrogen reduction. The reclaimed water, which is of a higher quality than when initially received, is discharged to the Blackwater River.

Also in 1985, the Milton interceptors were constructed. The interceptors were installed to phase out obsolete sewage pumping stations located throughout the City. It also relieved overloaded sewers by diverting the sewer load from the North Milton service area directly to the plant's master lift station. In 2005, the treatment facility was upgraded to Advanced Wastewater Treatment

(AWT). The capacity remained at 2.5 MGD, but the permit limits were reduced to come in line with AWT standards. Additionally in 2005, over 3,200 linear feet of gravity sewer were lined and 500 manholes were rehabilitated to omit nearly 250,000 gallons per day of inflow and infiltration.

**Table 6.1.1:
City of Milton Wastewater Treatment Plant Effluent Permit Limitations**

Parameters	Limitations
Flow*	2.5 MGD (Max. Mo. Avg.)
pH	6.0 (Min.) 8.5 (Max)
Chlorine Residual	1.0 mg/1 (Min) 0.1 mg/1 (Max)
BOD	8.0 mg/1 (Max Annual Avg.)
Total Nonfilt.	
Residual (SS)	5.0 mg/1 (Max. Annual Avg.)
Fecal Coliform	14 ml (Max. Annual Avg.)

City of Milton, Public Works

An indication of the actual effluent performance is shown in Table A-2 which gives the water quality parameters for the sewage treatment plant effluent. The effluent has been well within all FDEP/EPA parameters for water quality. The system has no other significant impacts upon natural resources.

**Table 6.1.2:
Summary of Milton Wastewater Treatment Plant Operational Parameters**

	Effluent	Effluent	Effluent	Total
FLOW	CBOD 5	TSS	pH	KJELDAHL
(MGD)	(mg/l)	(mg/l)	(Std. Units)	Nit. (mg/l)
Mean Value (Avg.) of Operational Data, 2012				

1.094	4	5	6.7	5.2
1.51	1.36	1.11	6.8	.74
FDEP/EPA Limits: Maximum Average				
2.500	15	20	6.0-8.5	N/A
FDEP/EPA Limits: Maximum Weekly Average				
2.500	23	30	6.0-8.5	N/A

City of Milton, Public Works

1. *Capacity/Performance Assessment*

The collection system consists of over 700,000 linear feet (L.F.) of sewer lines from four-inch diameter to twenty-four inch diameter (excluding interceptor sewers). At present, more than 75 percent of the collection lines are eight inch diameter pipes installed at minimal slopes. The collection system also includes over 35 lift stations.

The design capacity of the Milton Sewage treatment Plant is 2.5 million gallons per day (MGD). Average daily flow data reported to the Florida Department of Environmental Protection indicated a demand of approximately 1.51 MGD for the period from February 2012-January 2013. This leaves the system with a surplus capacity of 0.99 MGD. Currently, the system is serving approximately 4850 connections. The number of persons per occupied household in Milton in the year 2011 was estimated at 2.31. This figure is utilized to reflect the commercial and industrial usage per person. This number was applied to the number of connections to obtain a residential equivalent Level of service (LOS) of 133.8 gallons per capita per day, which exceeds the City's adopted LOS standard of 100 g/c/d. Though the general condition of the system is good, especially the recently upgraded portions, the city is growing. The City's sewer service is growing; in the last two years alone over 750 new connections have been established. The recent annexations of a utility service in the Skyline district as well as an ever increasing population have applied additional stresses to the system.

Adequate capacity will be available to serve the existing and projected population of the City to the year 2025. However, when taking commercial growth and additional connections outside the city into consideration, the current treatment facility appears inadequate. There are a number of different connection projection methodologies available to investigate the demand verse capacity relationship. The worst case scenario suggests a system capacity deficiency sometime between 2015 and 2020. Other system deficiencies, including groundwater infiltration problems, will be addressed in the future. The City has been considering a new wastewater treatment facility for some time. Currently, a new facility location has been acquired, the planning and engineering is well on its way, and financing options are being sought after. The East Milton Waste Water Treatment Plant, scheduled to come on line in the not-so-distant-future, will address the current systems deficiencies.

**Table 6.1.3:
Approximate Connections**

Year	Total Connections	Residential Demand	Commercial Demand	Total Demand g/c/d
2015	6080	1,221,897	667,888	1,889,785
2020	8836	1,775,770	970,635	2,746,405
2025	12841	2,580,656	1,410,584	3,991,240

*Table A-3 data is based on an annual 8% connection increase similar to the recently observed connection increase rate.

2. Septic Tanks

In general, septic tanks have worked well where they have been adequately separated and in areas with sandy soils and low groundwater tables. The Soils Map shows the soil types within the City of Milton. The following soil types are represented according to the Soil Survey of Santa Rosa County (USDA, 1980):

**Table 6.1.4:
Santa Rosa County Soil Survey**

Soil type	Complex
Bibb-Kinston	Pactolus
Bonifay	Pits
Fuquay	Rutledge
Johns	Troup (0-5% slope)
Lakeland (0-5% slope)	Troup (5-8% slope)
Lakeland (5-12% slope)	Troup-Orangeburg-Cowarts

USDA Natural Resources Conservation Service, Soil Survey of Santa Rosa County, 1980

Of these types, the Soil Survey identified the Bibb-Kinston, Johns, Lakeland (5%-12% slope), Pactolus, Pits, Rutledge, and part of the Troup-Orangeburg-Cowarts complex as having severe limitations for use in septic tank absorption fields. As the map shows, these types occur mainly along the Blackwater River, and much of the developed portions of southeast and east-central Milton. However, the only areas within the City having severe septic tank limitations which are currently sewer-less are small areas of Bibb-Kinston and Rutledge soils along the southern

City boundary, from US 90 to the Blackwater River, a small area east of Broad Street, and Buzzard Island, as well as areas south of Munson Highway, fronting the river (see Unsuitable Soils for Septic Tanks Map).

The City of Milton plans to begin a testing program in these areas to determine if septic tanks are contributing to degradation of water quality. The program will be done in cooperation with the Santa Rosa County Health Department. Where problems are discovered, development using septic tanks will be required to be converted to the sanitary sewer system. Any required conversions and/or extensions of the sewer system will be prioritized by a study to be done after completion of the testing program.

More restrictive regulations are planned for sewer-less areas within 150 feet of the Blackwater River (An Outstanding Florida Water) and are discussed further in the Conservation Element.

D. SUMMARY AND RECOMMENDATIONS

As the preceding section shows, there is a demonstrated need to expand the treatment capacity of the sanitary sewer system. The current wastewater treatment plant, though historically sufficient and geographically acceptable, is now nearing a max capacity date as well as becoming aesthetically displeasing and a hindrance upon the desired future growth of the Blackwater River waterfront. The City of Milton will continue to pursue and plan for the relocation of the current wastewater treatment facility.

E. GOALS, OBJECTIVES & POLICIES

GOAL 1: TO PROVIDE SANITARY SEWER, SOLID WASTE, STORMWATER MANAGEMENT, POTABLE WATER, AND AQUIFER PROTECTION SERVICES TO MEET THE NEEDS OF CURRENT AND FUTURE RESIDENTS OF THE CITY OF MILTON IN ACCORDANCE WITH ADOPTED LEVEL OF SERVICE STANDARDS.

OBJECTIVE 1.1: THE CITY OF MILTON WILL CORRECT EXISTING FACILITY DEFICIENCIES BY IMPLEMENTING THE FIVE YEAR SCHEDULE OF CAPITAL IMPROVEMENTS, REVIEWING AND REVISING THE SCHEDULE ANNUALLY, AND BY IMPLEMENTING POLICIES 1.1.1 AND 1.1.2.

POLICY 1.1.1: Projects included in the Five Year Schedule of Capital Improvements will maximize the use of existing facilities by prioritizing improvement of existing infrastructure deficiencies through replacement or correction.

POLICY 1.1.2: The “Infrastructure” Element will be revised and updated as necessary to identify required improvements as part of the Comprehensive Plan.

OBJECTIVE 1.2: IN ORDER TO ASSURE THE AVAILABILITY OF PUBLIC FACILITIES CONSISTENT WITH THE FUTURE LAND USE MAP, THE CITY OF MILTON WILL COORDINATE THE EXTENSION OF OR THE INCREASE IN CAPACITY OF FACILITIES NECESSARY TO MEET FUTURE NEEDS THROUGH THE ADOPTION, IMPLEMENTATION, AND ANNUAL REVIEW OF THE CAPITAL IMPROVEMENTS ELEMENT OF THE COMPREHENSIVE PLAN, AND BY IMPLEMENTING POLICIES 1.2.1 AND 1.2.2.

POLICY 1.2.1: The following level of service standards are hereby adopted, and shall be used as the basis for determining the availability of facility capacity and the demand generated for all new development and redevelopment activity:

FACILITY	LEVEL OF SERVICE STANDARD
Potable Water Facilities	117 gallons/capita/day
Sanitary Sewer Facilities	100 gallons/capita/day
Solid Waste Facilities	4.4 lbs./capita/day
Stormwater Management Facilities	Treatment of the first inch of runoff is required for sites less than 100 acres in size and treatment of the first one and one-half inches of runoff is required for sites greater than 100 acres in size, given a 100-year frequency, 24-hour duration design storm event.

POLICY 1.2.2: The following projects are desirable to meet future infrastructure needs and may be included in the City’s Capital Improvements Program as City and other private, County, State or Federal funds become available:

- Further expansion of sanitary sewer service to East Milton and the Bagdad area;
- Upgrading of potable water distribution system through water main modifications, construction of an elevated water tank, and/or construction of an additional well.

OBJECTIVE 1.3: IN ORDER TO PROTECT THE QUALITY OF THE BLACKWATER RIVER AND ASSOCIATED CREEK SYSTEMS, AND TO PROVIDE FOR COMPACT URBAN DEVELOPMENT, THE CITY OF MILTON WILL MAXIMIZE THE USE OF EXISTING INFRASTRUCTURE SYSTEMS, AND WILL MINIMIZE THE POTENTIAL TO PROMOTE URBAN SPRAWL IN THE PLANNING OF FUTURE SYSTEMS OR EXPANSIONS.

POLICY 1.3.1: The Water Supply Facilities Work Plan will be consistent with the adopted level-of-service standards established in Policy 1.2.1 of this element.

OBJECTIVE 1.4: THE CITY OF MILTON SHALL FURTHER PROTECT THE QUALITY OF THE BLACKWATER RIVER, A DESIGNATED OUTSTANDING FLORIDA WATER, BY IMPLEMENTING POLICIES 1.4.1 THROUGH 1.4.3.

POLICY 1.4.1: The City of Milton shall continue to require conversions from existing septic tank use to sanitary sewer facilities within 150 feet of the Blackwater River.

POLICY 1.4.2: The City of Milton shall continue to research and utilize alternative methods of effluent disposal.

POLICY 1.4.3: The City of Milton shall continue to cooperate with other government agencies, as appropriate, to provide for additional property and techniques for the disposal of effluent from the Wastewater Treatment Plant.

SOLID WASTE SUB-ELEMENT

INTRODUCTION

The Solid Waste Element provides an understanding of both solid waste and hazardous wastes in the City. On average, each person within the City of Milton produces 3.9 pounds of solid waste per day. Although hazardous waste disposal is not a large component of the total waste generated, several large and small hazardous waste generators are located within the City.

The purpose of this sub-element is to determine the current and projected needs of the City of Milton in order to provide adequate solid waste facilities to meet those needs. Analysis and projected levels of service are based on an inventory of existing facilities and capacities.

1. *Organization of the Element*

This element is divided into four major sections, the Introduction, Terms and Concepts, Existing Regulatory Framework, and Data and Analysis. The Terms and Concepts define the terms applicable to solid waste, which are utilized throughout this document. The Existing Regulatory Framework describes the current federal, state, regional and county regulations. The Data and Analysis section identifies the conditions of the City's solid waste disposal facilities. The Needs and Assessments subsection describes the City's solid waste facility capacity, population projections, and provides current and projected needs assessment at the recommended level of service for both solid and hazardous waste.

2. *Relationship to Other Elements of the Comprehensive Plan*

There are several key linkages between the Solid Waste Element and other elements of the Comprehensive Plan.

The *Future Land Use Element*, as an overall blueprint for managing growth in the City, defines the direction and intensity of future growth and development, and will strongly influence the analysis of future solid waste disposal demand within the City of Milton.

The *Conservation/Element* identifies all of the City's natural resources and discusses various preservation and land management techniques, which will help to eliminate various land use conflicts.

The *Intergovernmental Coordination Element* provides opportunities to improve City collaboration and coordination with other agencies such as the Florida Department of Environmental Protection (FDEP) and the U.S. Environmental Protection Agency (EPA).

The *Capital Improvements Element* reflects the City'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 solid waste collection. In addition, the Capital Improvements Element reflects recommendations, which should support the Goals, Objectives, and Policies of this Element.

The *Infrastructure Element* consists of five Sub-Elements, including the Potable Water, Sanitary Sewer, Natural Groundwater Aquifer Recharge, Stormwater Management and Solid Waste.

Together, these Sub-Elements help shape the development trends within the City of Milton into the next planning horizon, thus directly impacting municipal solid waste management and hazardous waste management practices within the area.

A. TERMS AND CONCEPTS

Terms included in Appendix A 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

Commercial Waste: Waste generated by commercial and institutional entities. These wastes have physical characteristics similar to residential wastes, consisting largely of combustible materials such as paper and food waste.

Composting: The process by which biological decomposition of the organic constituents of solid waste under controlled conditions occurs.

Industrial Waste: Waste generated by industrial processes and manufacturing operations. These can include general industrial housekeeping and support activity wastes, but exclude hazardous wastes.

Landfill: The final disposal (burial) site of solid waste that has not been, or cannot be, recycled.

Large Quantity Generators (LQG): Generators that produce over 2,200 pounds of hazardous waste per month.

Leachate: A liquid that has emerged from solid waste and contains dissolved or suspended materials.

Recycling: Any process by which materials otherwise considered to be solid waste are collected, separated, processed and reused or changed into raw materials or new products.

Residential Waste: Mixed household solid wastes, including yard trash.

Resource Recovery: The process of recovering usable materials or energy from the municipal solid waste system.

Small Quantity Generators (SQG): Generators that produce between 200 and 2,200 pounds of hazardous waste per month.

Special Waste: Waste having special characteristics or requiring special handling. These wastes include tires, asbestos, liquids, sludge, containers, oversize bulky wastes, and process fuels.

Transfer Station: A facility established to receive and store solid waste, including recyclables, prior to transportation to a processing plant or disposal site.

Waste Generation Unit: A weight unit equivalent to 1 ton of solid waste.

Yard Wastes: Vegetative matter resulting from landscaping maintenance and land clearing operations. These wastes are generated in both the residential, commercial and industrial sectors.

Solid Waste: The materials in this sub-element fall under the definition of solid waste as adopted in Section 9J-5.003(125) (Florida Administrative Code, F.A.C.). Rule 9J-5 defines solid

waste as sludge from waste treatment plants and air pollution control facilities. Garbage, rubbish, refuse and other discharged materials are also considered solid waste. Any solids, liquids, semi-solids and controlled gaseous materials resulting from domestic, industrial, commercial, mining, agricultural or governmental operations are also defined as solid waste. Solid waste facilities are structures designed for the collection, processing or disposal of solid wastes. Such facilities include transfer stations, processing plants, recycling plants, landfills and other disposal systems.

Solid waste is further defined by the generation source and characteristics of materials composing the waste. Residential wastes are mixed household wastes including yard clippings. Commercial wastes are generated by commercial sources and are similar to residential wastes in composition. These wastes consist of paper and foods from offices, restaurants, retail stores and centers, schools and churches. Industrial wastes are generated by industrial sources and manufacturing processes. Hazardous wastes produced by these sources are not included in solid waste management and need to be treated and disposed of by different methods. Special wastes include wastes that have special characteristics or require special handling or disposal, again excluding hazardous waste. These wastes include oversized bulky wastes, materials generated in demolition and construction activities, abandoned automobiles, batteries, tires, waste oil, sludge, dead animals and septic tank pumpings.

Hazardous Waste: This sub-element also addresses hazardous wastes as defined in Section 9J-5.003 (56) (F.A.C). Hazardous waste is defined as solid waste or a combination of solid wastes, which, because of the composition, may cause or contribute to an increase in mortality or an increase in serious irreversible illness. These wastes include anything that may pose a threat or hazard to human health or the environment when transported, stored or disposed of improperly. Hazardous waste requires treatment or processing in handling and disposal.

B. EXISTING REGULATORY FRAMEWORK

The focus on solid waste and hazardous waste management has been a major concern nationwide, as well as throughout the state of Florida. In Florida, over 90% of the population is dependent on groundwater from aquifers for its water supply. Once pollution reaches a groundwater resource, the aquifer may hold the contaminants for thousands of years, continually polluting the groundwater that flows through the area. As a result, the protection of land from contamination is an essential aspect in the preservation of the extensive network of aquifers that provide the residents of the City of Milton, and Florida, with water supplies for the future.

The potential environmental impacts of solid waste facilities have led to the development of an extensive network of permitting requirements at the federal, state, regional and local level. An overall discussion of the regulatory framework that has been developed will help put in perspective the issues that must be addressed in waste management, and to describe what agencies are mandated to help manage waste.

1. Federal

Federal regulations for solid waste management have primarily focused on adequate disposal of waste, with little emphasis placed on controlling solid waste generation or mandating recycling practices on a nationwide level. Therefore, federal regulations have centered around the

potential environmental impacts of solid waste facilities, developing an extensive network of permitting requirements at the federal and state levels. The U.S. Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (DEP) review facilities with impacts on air and water quality. In contrast, in areas where dredging and filling may occur, the U.S. Army Corps of Engineers (USACE) must also review the facilities.

In relation to hazardous waste regulation on the federal level, the United States established the "Resource and Recovery Act" (RCRA)(US Public Law 94-580) in 1976. The Act established a means of monitoring hazardous waste by directing the EPA to develop a national program to regulate and manage the production and disposal of hazardous waste and provide incentives for states to adopt consistent programs. The RCRA further required the EPA to establish standards necessary to protect the human health and the environment from hazardous and toxic waste. The RCRA gives States with approved programs primary responsibility for hazardous waste management. Under this Act, the EPA is responsible for developing regulations in four major areas, which include:

- 1) The establishment of a manifest system to track the movement of hazardous waste from "cradle to grave;"
- 2) Development of criteria to identify what constitutes a hazardous waste, and a listing of hazardous wastes;
- 3) Promulgation of standards for generators, transporters, owners and operators of treatment, storage and disposal facilities for hazardous waste with permit requirements for all such facilities;
- 4) The establishment of state-based waste management programs.

In addition, the RCRA sets guidelines for the development of solid waste management plans, prohibits open dumping (while requiring the closure or upgrading of existing dumps), and regulates underground storage tanks. The Act also encourages public participation in the regulatory process. Regulations are enforced through civil penalties, civil actions for injunctive relief and judicial penalties. RCRA specifies that generator standards include specific requirements for the record keeping, reporting, use of appropriate containers, container labeling, providing information on the chemical composition of the waste and compliance with the manifest system. Similarly, transporter standards also include record keeping requirements, labeling requirements, and requirements for compliance with the manifest system. These standards also restrict the transportation of hazardous waste to permitted facilities only. The Hazardous and Solid Waste Amendments of 1984 serve to expand and strengthen these provisions and broaden those subject to federal hazardous waste regulations to include small quantity generators (SQGs).

In 1998, the U.S. EPA established the National Comprehensive Emergency Response and Compensation Liability Act (CERCLA), also known as the EPA "Superfund Program." This act gave the EPA the authority to respond to incidents requiring hazardous waste site cleanup and emergency mitigation and provided funding for site cleanup. The Act also defined the liability of a business engaged in hazardous waste generation, transport and disposal, provided for enforcement measures, and establishes priority of the sites and selects sites for clean-up and mitigation when needed.

2. State

To parallel the legislative efforts of the EPA, Florida has taken sound steps in managing solid and hazardous waste generation and disposal within the state boundaries. Chapter 403.700, F.S.,

has delegated regulatory responsibility on the state level to the Department of Environmental Protection (DEP). The applicable DEP regulations governing solid and hazardous waste facilities are contained respectively in Chapter 62-700 and 62-730, F.A.C. In addition, surface water facilities require permit review by the regional water management district (Northwest Florida), which are also responsible for state level review for water quality and quantity impacts.

In 1980, the Florida Legislature passed the Florida Resource Recovery and Management Act (FRRMA). This act adopted the federal guidelines and directed the Florida Department of Environmental Protection (FDEP) to develop and implement a hazardous waste management program. Amendments to the FRMMA in 1983 provided directions and funds to establish a cooperative hazardous waste management program between local, regional and state levels of government. Regulation of hazardous wastes by the Department of Environmental Protection is performed under Chapter 62-730, F.A.C. This section contains requirements for Treatment, Storage and Disposal (TSD) Facilities, Large Quantity Generator (LQG) facilities, Small Quantity Generator (SQG) facilities, and Conditionally-Exempt Small Quantity Generator (CESQG) facilities.

In 1988, the legislature passed the Solid Waste Management Act titled "An Act Relating to Waste Management" (Chapter 88-130, F.S.) pertaining to a wide variety of solid waste issues. The Act was designed to reduce the amount of waste being generated by the public and encouraged recycling, composting and other methods of solid waste management and resource recovery. The basic goal was to reduce the amount of solid waste by 30% before it is incinerated or land-filled. It provided for grants to assist local governments in achieving this goal and stipulated that governments that fail to implement recycling programs will be ineligible for such grants.

In addition, impacts on air and water quality are reviewed by FDEP, along with the U.S. EPA. Similarly, actual construction and operation of solid waste facilities require further permits and review by the State Department of Environmental Protection (FDEP).

3. *Regional*

The Northwest Florida Water Management District (NFWFMD) implements regional regulations relevant to the Solid Waste Sub-Element. These regulations include the issuance of consumptive use permits (CUPs) and state level review for water quality and quantity impacts, as discussed in the previous section (State level regulations).

4. *Local*

Solid Waste from the City of Milton is disposed of at the Central Landfill. The landfill is owned and operated by Santa Rosa County. A proportional capacity has not been assigned to the City of Milton. Since the time of plan adoption, the County has increased the size of the landfill to 593± acres. The current facility is expected to accommodate the needs of the projected

population well beyond the planning horizon. Mandatory collection of solid waste continues to be provided by the City. According to the County, the landfill currently has enough remaining capacity to meet the needs of its consumers, be they residential, commercial, institutional, or industrial until the year 2065. Thus, based on estimated population projections of the landfill service area, the remaining life of the landfill is approximately 55 years.

C. GOALS, OBJECTIVES, AND POLICIES

The Goals, Objectives, and Policies for this sub-element are addressed in other sub-elements of this Infrastructure Element. See Objective 1.2 Sanitary Sewer Sub-element.

STORMWATER MANAGEMENT SUB-ELEMENT

INTRODUCTION

The purpose of the City of Milton Stormwater Management Element is to describe the existing stormwater systems and drainage problems and to set forth the basic policies to ensure that the City will be able to meet the existing and anticipated stormwater management needs. The analysis of the existing conditions and future needs serves as a basis for formulating suitable recommendations concerning the Stormwater Management needs in addition to formulating the Goals, Objectives, and Policies (GOP's).

In evaluating this sub-element, it became apparent that the information found in previous renditions of this document was lacking. In light of that fact, the basis for this sub-element is the Foundation Document for the Santa Rosa County Comprehensive Plan 2008-2025.

1. *Organization of the Element*

This element is divided into four main headings, the Introduction, Terms and Concepts, Existing Regulatory Framework, and Data and Analysis. The Terms and Concepts 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 current stormwater management conditions of the City. This section describes several factors that influence the stormwater management practices employed within the City. The Implementation subsection discusses funding sources and future actions to assist in the planning, design and implementation of actions required to meet the future Stormwater Management needs of the City of Milton.

2. *Relationship to Other Elements of the Comprehensive Plan*

There are several key linkages between the Stormwater Management Sub-Element and other Elements of the Comprehensive Plan which include the following:

The *Future Land Use Element* is an overall blueprint for managing growth in the City, it defines the direction and intensity of future growth and development. The future land use types and intensities will have a direct impact on the Stormwater Management quantity and quality in different areas of the City.

The *Conservation Element* identifies all of the City'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 discussing 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 City collaboration and coordination with other agencies and units of government, such as, Santa

Rosa County, the Florida Department of Environmental Protection and the U.S. Environmental Protection Agency (EPA) to develop the best Stormwater Management tools to meet the needs of the City of Milton.

The *Capital Improvements Element* will reflect the City's strategy for delivery of infrastructure and other public services, and will serve a primary role in growth management and help shape future stormwater management. 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 Element.

The *Infrastructure Element* consists of five sub-elements, which include Potable Water, Sanitary Sewer, Stormwater Management, Solid Waste and Natural Aquifer Groundwater Recharge. Together, these sub-elements will impact the development patterns within the City of Milton into the next planning horizon. This in turn will influence the Stormwater Management practices within this area.

A. TERMS AND CONCEPTS

Best Management Practices (BMPs): Practices used to achieve satisfactory water quality at a minimum cost. Structural BMPs emphasize preservation and/or simulation of natural drainage features to promote infiltration, filtration, and reduced peak discharges. Examples include: retention/detention ponds, infiltration trenches/basins and grassed swales. Examples of non-structural BMPs include: watershed management, facilities maintenance, land use planning and public education.

Capacity Analysis: A determination of a stormwater management facility's ability to provide a given level of service.

Capital Improvement Plan: A projected schedule of capital projects based on estimated costs and expected funding.

Conveyance: Transport of stormwater via pipe and/or open channel system(s).

Design Capacity: The amount of flow a storm sewer system is designed to manage, usually expressed in cubic feet per second for flow and cubic feet or acre feet for storage.

Design Storm Event: A measure of capacity for which drainage facilities are designed. The design storm event is calculated by the intensity, duration, and frequency of the storm.

Flood Zones: Areas that have been designated as "special flood hazard areas" have been delineated by the FEMA's National Flood Insurance (NFIP) as "A" zones or "V" zones on Flood Insurance Rate maps (FIRMs). Designated flood zones as defined by the FEMA are listed below:

Zone "A"	Base flood elevations have not been determined.
Zone "AE"	Base flood elevations determined.
Zone "AH"	Base flood elevations determined; flood depths of 1 to 3 feet (usually areas of ponding).
Zone "AO"	Average depths determined; flood depths of 1 to 3 feet.
Zone "D"	Areas in which flood hazards are undetermined.
Zone "V"	Coastal flood area with velocity hazard (wave action); no base flood elevations determined.

Zone "VE"	Coastal flood area with velocity hazard (wave action); base flood elevations determined.
Zone "X"	1) Areas outside of 500 year flood;
Zone "C"	2) Areas of 500 year flood (outside 100 year flood); or

Areas of 100 year flood with average depths less than 1 foot, with drainage areas less than 1 square mile, or areas protected by levees from a 100-year flood.

COBRA Zone: Flood insurance not available for new or substantially improved structures after a specific deadline on designated coastal barrier islands.

Flow Rate: Area X Velocity = Quantity per unit of time, or discharge rate. $A \times V = Q$ is the formula for determining the capacity of drainage facilities. "A" represents the area of the cross section of the drainage facility and is expressed in square feet. "V" represents the velocity speed and duration of the water and is expressed as a rate in feet per second (ft/s). The product "A" and "V" equals "Q" the quantity of water per unit of time. "Q" is expressed in cubic feet per second (CFS).

Impervious Surface: A substance or surface, such as roads, parking lots, buildings, which will not allow percolation of water or other liquids (impermeability) into the ground.

Models: Approximations of the hydraulics and hydrology or a drainage basin based upon mathematical derivations of quantifiable relationships between various factors. These factors usually include, but are not limited to, area, slope, drainage system characteristics, rainfall and land use.

Outfall: The location where stormwater flows out of a given system. The ultimate outfall of a system is usually a "receiving water".

Percolation: The ability of water to pass through a porous medium. In most cases, this medium is the underlying soil.

One Hundred (100) Year Storm Event: The eschewed probability of a storm capable of producing a specific amount of rainfall in a specific period of time which has a one (1) percent chance of being equaled or exceeded in a given year.

Pre-development Conditions: The conditions (relief, land cover, and the rate, volume and direction of stormwater runoff) which are present at a site prior to the commencement of land disturbing activities.

Post-development Conditions: The conditions (relief, land cover, and the rate, volume and direction of stormwater runoff) which are present at a site following the completion of land disturbing activities.

Stormwater Treatment Facility: A structural "best management practice" (BMP) designed to reduce pollutant loading on a receiving water by either reducing the volume of flow; biological uptake of pollutants, the limiting the loading of pollutants or by allowing pollutants to settle out of stormwater flow. Structural BMPs include but are not limited to detention basins, retention basins, open bottom inlets, undercut ditches, exfiltration trenches and swales.

Swale: A stabilized and/or grassed trench with side slopes less than three (3) feet horizontal to one (1) foot vertical. A properly functioning swale should convey stormwater runoff while providing some water quality treatment, and requiring minimal maintenance.

Ten (10) Year Storm Event: The eschewed probability of a storm capable of producing a specific amount of rainfall in a specific period of time which has a ten (10) percent chance of equaled or exceeded in a given year.

Twenty-five (25) Year Storm Event: The eschewed probability of a storm capable of producing a specific amount of rainfall in a specific period of time which has a four (4) percent chance of being equaled or exceeded in a given year.

Stormwater Management:

Stormwater management is a term used to describe all aspects used to control stormwater runoff in areas affected by development. Typical measures of management include storm sewers, culverts, swales, and retention and detention basins. Storm sewers and culverts help convey stormwater from one point to another. In addition, detention and retention basins reduce and eliminate the peak rate of flow respectively. These facilities, in turn, affect both the quantity and quality of stormwater runoff. Therefore, these facilities have become the central point of focus of stormwater management.

Detention Facilities:

The primary task of detention facilities is to temporarily store water during a storm and to slowly release it so that the net effect is the reduction of the rate of flow of the runoff. This reduction is known as attenuation of the flow. In these facilities, water is stored in a pond or reservoir, which is typically an open cut in the ground or a series of underground pipes or chambers. An outlet structure or spillway employing an orifice, weir or a combination of flow controlling devices then accomplishes the slow release of water.

Water quality improvement of stormwater runoff is an important consideration in the selection of a detention basin design. However, to be effective, the basin must provide a permanent pool with sufficient storage time to allow for the physical, chemical and biological removal of pollutants. The Department of Environmental Protection has strict requirements for the design and implementation of these types of stormwater management facilities. These criteria will vary depending on individual site characteristics.

Retention Facilities:

Similar to detention facilities, the primary task of retention-type stormwater management facilities is to capture the runoff during a storm event. However, retention facilities do not have an outlet structure. The runoff is simply routed into these basins, where the water will be stored. The runoff leaves this type of facility through either evaporation or percolation. Therefore, primary consideration must be given to the underlying soil type and depth to water table before it is determined that this type of facility is to be used. Although these facilities, if used correctly, can play an important role in providing areas of recharge to the underlying groundwater sources, if they are not used in the proper circumstances, they can cause more problems than benefits.

In cases where the underlying soil types have adequate permeability, retention ponds are a very effective method of improving the quality of the stormwater runoff entering the groundwater aquifer. Recent research indicates that most of the pollutants carried by stormwater runoff are contained in the first one inch or so. Diverting this first flush of runoff into a retention basin allows for their elimination. However, in a similar fashion to the practices that must be employed with detention-type systems, the gradual accumulation of these sediments and pollutants must be removed in order to maintain the performance of this type of basin.

Basins can, and in many cases do, employ detention and retention components. Runoff that is routed to these facilities will be retained until the retention volume is exceeded. At that point, excess runoff will be detained with the use of outflow structures as previously described.

B. EXISTING REGULATORY FRAMEWORK

1. Federal

The three primary agencies responsible for regulation of stormwater management in the United States are the U.S. Environmental Protection Agency (EPA), the Federal Emergency Management Agency (FEMA) and the U.S. Army Corps of Engineers (USACE). EPA regulatory framework includes the implementation of the Clean Water Act of 1987 and Section 208 of the Federal Water Pollution Control Act.

U.S. Environmental Protection Agency

The Federal Water Pollution Control Act and The Clean Water Act of 1987 are the primary regulations governing stormwater management on the federal level. In relation to the Federal Water Pollution Control Act, the U.S. Environmental Protection Agency (EPA) has identified several pollutants carried in stormwater runoff as a major source of water contamination. To achieve the goals set forth by this Act, the EPA has provided assistance to state and local agencies for the development of area wide Water Quality Management Plans, or “208” Plans. These plans are intended to study a broad range of potential water pollution sources, including stormwater, and focus on identifying pollutant and abatement needs as well as to develop regulatory programs to ensure implementation.

In relation to the regulation of stormwater discharge quality, the Clean Water Act, and its respective amendments in 1987 required the EPA to develop a permit system for this area. The intent of this system was to reduce the pollutant loadings of the subsequent runoff for these areas. Under this Act, the National Pollutant Discharge Elimination System (NPDES) was implemented, requiring all facilities with conveyances in place to direct wastewater or stormwater to waters of the United States to submit an application for municipal separate storm sewer system (MS4) discharges. In addition, under the Clean Water Act, EPA is responsible for issuing and reviewing all dredge and fill permits with the assistance of the U.S. Army Corps of Engineers (USACE), the Department of Environmental Protection (DEP) and the Northwest Florida Water Management District (NFWMD). The pertinent regulations and the department responsible for the jurisdiction of these activities vary with the type and quantity of the dredge and fill activities performed. In 1995, a combination of the dredge and fill permit issued by DEP and the former Storage and Management of Surface Waters (MSSW) permit issued by the Water Management Districts were used to form what became known as Environmental Resource Permits (ERPs). This Program was initiated to ensure that any new type of development will not cause flooding by adversely affecting the natural flow and/or the storage of water while preventing stormwater pollution in nearby lakes and streams and to protect the wetland environments. The Northwest Florida Water Management District does not implement Florida's Environmental Resource Permit (ERP) program. Section 373.4145, Florida Statutes, exempts the District from the implementation of this program due to its limited financial resources. The Florida Department of Environmental Protection is responsible for all non-agricultural wetland related permits.

Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) is indirectly responsible for the regulation of stormwater management and flood protection in Santa Rosa County. These practices are carried out through the Agency's establishment of regulations for the National Flood Insurance

Program (NFIP). FEMA completed the Flood Insurance Study (FIS) for the incorporated areas of the City of Milton (Community Number 120276), on November 1, 1985. Since that time, the FEMA maps for the southern portion of the County were revised in December 2006 to take into account changes caused by Hurricane Ivan in 2004, and Hurricane Dennis in 2005. The study includes peak discharges, floodway, and base flood elevations for the applicable floodplain areas within the County. The study also includes elevations for the 10-year, 100-year, and 500-year return frequency floods. These elevations are used to carry out the floodplain management objectives of the NFIP that will be used to determine the appropriate flood insurance premium rates for buildings and their contents.

U.S. Army Corps of Engineers

The primary responsibilities of the Corps of Engineers are to regulate the wetlands and regulate major dredge and fill activities within the United States. Under Section 9 of the Rivers and Harbors Act and Section 404 of the Clean Water Act, the USACE works in cooperation with the EPA in the regulation of activities within jurisdictional wetlands. Also, as previously discussed the Corps works in cooperation with the Environmental Protection Agency in the issuance of dredge and fill permits within Santa Rosa County.

2. State

At the state level, there are two primary agencies responsible for Stormwater Management within the City of Milton. These agencies include the Florida Department of Environmental Protection (DEP) and the Florida Department of Transportation (FDOT).

Florida Department of Environmental Protection

The Florida Department of Environmental Protection (DEP) is responsible for the implementation of appropriate rules for the design and construction of stormwater management facilities under Chapter 62-25, F.A.C. This section of regulation provides the Department with design standards and permitting requirements for new stormwater facilities within the City of Milton, as well as throughout the state of Florida.

In addition, DEP is responsible for the review and permitting of stormwater discharges into waters of the State under Chapter 62-3 of the F.A.C to ensure that state water quality standards are not compromised. Chapter 62-302.530 contains a table for the acceptable standards for the water quality permitted for stormwater discharges.

Florida Department of Transportation

The Florida Department of Transportation (FDOT), under the authority of Chapter 353-02, F.S. owns and maintains several drainage facilities, which serve major arterial roads within the City of Milton. Many outfall ditches, canals and stormwater structures, for example, drain the I-10, U.S. Highway 90 and U.S. Highway 98 corridors. In addition, the FDOT permits connections to stormwater management facilities (SWMF) within FDOT right-of-ways.

3. Regional

There are two agencies responsible for establishing the regional Stormwater Management policies within the City of Milton. However, only one of these regional agencies is responsible for regulating Stormwater Management criteria. These agencies include the Northwest Florida Water Management District (NFWWMD) and the West Florida Regional Planning Council (WFRPC).

Northwest Florida Water Management District

The Northwest Florida Water Management District (NFWWMD) encompasses an area of approximately 11,305 square miles, which includes all of Santa Rosa County and the City of Milton. Other duties of the NFWWMD include regulation of the management and storage of surface waters within the district boundary under the authority of Chapter 40C-42, F.A.C. In addition, the 1987 Surface Water Improvement Management (SWIM) Act directed the NFWWMD to develop a SWIM Plan for the Pensacola Bay System. The SWIM Plan for the Pensacola Bay System Watershed, which encompasses the area of Santa Rosa County including the City of Milton, was originally developed in 1997. Within this Plan, four principal issues were addressed. These issues include:

- Water and sediment quality;
- Habitat quality;
- Administration, planning and coordination; and,
- Public education and awareness

The SWIM Plan further addressed these issues by identifying respective goals, sub-programs, objectives, strategies and projects directing the organization of the watershed's surface water resource restoration and protection. Throughout this sub-element the SWIM Plan will be discussed further.

West Florida Regional Planning Council

Stormwater management regulation on the regional level also falls under the responsibility of the WFRPC. The WFRPC encompasses approximately 6,026 square miles, which include seven counties and thirty-five incorporated municipalities. In 1996, the Council adopted the West Florida Strategic Regional Policy Plan (SRPP). Several key components of this Plan are applicable to the Stormwater Management Sub-Element, including the Emergency Preparedness and Natural Resources of Regional Significance Elements.

4. Local

Three natural drainage systems have been identified: Blackwater River, Collins Mill Creek, and Pond Creek. The City continues to implement its adopted Comprehensive Stormwater

Development Plan. The extent to which the natural drainage systems have been modified by diverting and retaining water in various areas is documented.

An inventory of existing major drainage facilities and structures by location, size and conditions was completed shortly after the City adopted its comprehensive plan, but not soon enough to be included in that Comprehensive Plan. This inventory is now available. Data on rainfall intensity

and duration have been summarized for various regions of the state by the Florida Department of Transportation (FDOT) in graphs such as the one shown in Figure C-1. The curved lines on the graph represent the frequency of occurrence of rainfall events of various intensities and durations (at intervals of 2, 3, 5, 10, 25, 50, and 100 years) for this region. These graphs are used to specify design storm events. The conventional method is to indicate the required frequency and duration of the event, which allows the intensity and total rainfall amount to be interpreted from the appropriate hydrograph for the region. Thus, for the region to which Figure C-1 applies, a 10-year frequency/5-hour duration storm event would produce rainfall at an intensity of one inch per hour. Over a one acre parcel of land, this would produce a total storm flow of five acre-inches of 136 GPD. Ideally, the selection of a standard design storm must also be consistent with facility design for pollution abatement goals. Local regulations which affect land use and development of drainage features include: Erosion, Sedimentation, and Runoff Control Ordinance, which requires a drainage plan indicating all drainage improvements to be submitted prior to any clearing of land and encourages the use of porous materials, the preservation of ground cover, and the staging of land clearing; Flood Damage Control Ordinance, which requires the provision of easements for drainage improvements, and states that the City will not assume maintenance for subdivided areas with improper drainage.

These local ordinances, in addition to the state and federal regulations, provide for excellent control and maintenance of the functions of natural drainage features.

The City has enacted a Stormwater Utility in 2008 to maintain its stormwater management facilities and has developed a priority list for drainage problems to repair. The City has completed fifteen projects on this priority list to improve drainage issues. The Capital Improvements Program will be included as projects as part of the EAR-based amendments.

Local regulations which affect land use and development of drainage features include: Erosion, Sedimentation, and Runoff Control Ordinance, which requires a drainage plan indicating all drainage improvements to be submitted prior to any clearing of land and encourages the use of porous materials, the preservation of ground cover, and the staging of land clearing; Flood Damage Control Ordinance, which requires the provision of easements for drainage improvements, and states that the City will not assume maintenance for subdivided areas with improper drainage. These local ordinances, in addition to the state and federal regulations, provide for excellent control and maintenance of the functions of natural drainage features.

C. EXISTING CONDITIONS

1. Regional Drainage Basin Features

Three major drainage basins effect regional drainage patterns in Santa Rosa County: the Escambia River Basin, the Blackwater River Basin and the Yellow River Basin.

Principal urban areas of these basins are Pensacola, Milton, Century, Jay, and Crestview. A major portion of all land in this region is forested and consists of over 60 percent of the region's total 11,200 square miles. Agricultural lands comprise another 16 percent, followed by forested wetlands, which cover approximately 10 percent of the region. Water bodies, including lakes, rivers, bays, and estuaries cover approximately 6 percent of the total land area. Urban and developed areas account for an additional 6 percent of total land use in the region. The remaining 2 percent is divided between non-forested wetlands and barrier lands (such as mines, quarries, and beaches).

Existing Drainage Features

Surface Water:

Surface water features in the Milton area includes Locklin Lake, the Blackwater River, Big Coldwater Creek, and associated riverine areas, as well as a number of ponds and drainage facilities. The Blackwater River originates in southeastern Alabama as part of the Pea River Basin area. Locklin Lake is centrally located in Milton and is surrounded by low to medium density residential areas.

It should be noted that groundwater contribution is an important factor in determining the flow of the Blackwater River and Big Coldwater Creek. These streams receive large and fairly uniform discharges of ground water from the Sand and Gravel Aquifer that then to moderate their annual variations in stream flow. Average maximum, mean, and average minimum flows are presented in Table C-1.

**Table 6.3.1:
Daily Discharge**

Discharge	Blackwater River (Near Baker)	Big Coldwater Creek (Near Milton)
Maximum	810 ft ³ /sec	1620 ft ³ /sec
Mean (2012)	221.5 ft ³ /sec	327.3 ft ³ /sec
Minimum	61 ft ³ /sec	203 ft ³ /sec

<http://waterdata.usgs.gov>; Station Numbers: 02370000 and 02370500

Flood hazard areas, defined as areas with a one in one hundred chance of being inundated in any one year period, have been mapped by the U.S. Army Corps of Engineers. These maps indicate that significant portions of the City adjacent to the Blackwater River are at risk for flood hazard.

2. Needs Assessment

Capacity and Performance Assessment:

The central section of Milton is served by a storm water system composed of a network of underground pipes, concrete spillways, and drainage ditches. In outlying parts of the City, stormwater is drained through the natural process of percolation. Some areas where urban growth has occurred without specific attention to proper stormwater planning and installation have experienced problems of standing water and minor flooding following periods of heavy rainfall. As an example, the area near W.H. Rhodes Elementary School has historically not drained well.

Other drainage problems arise in areas where the storm sewer system is inadequate in size or design. Traditionally this type of problem involves new construction and urbanization in areas surrounding the problem area. The City's drainage system is not a unified system; however, performance and design standards have been adopted to consider a critical storm of up to 100 years and 24 hour duration, and treatment of the first one-inch (1") of run-off for sites less than 100 acres.

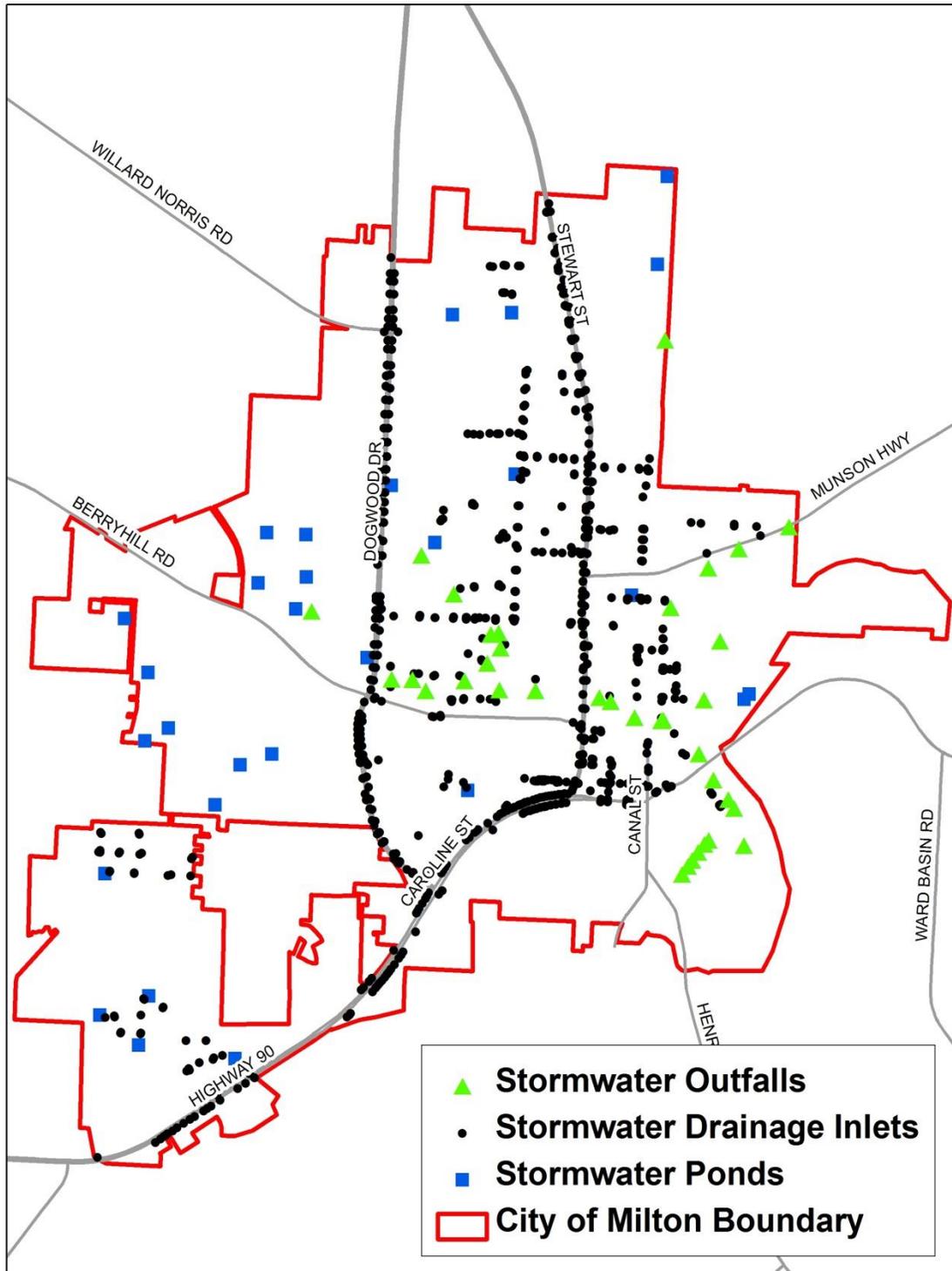
D. SUMMARY AND RECOMMENDATIONS

As stated in Milton's Land Development Regulations, all future development is required to meet level of service standards for infrastructure facilities, including stormwater management. A stormwater system must be able to carry any increased run-off caused by the development for a particular storm event, the design storm. This design storm is typically described as the stormwater management level of service standard.

The City of Milton meets the above recommendations. The City uses a 100-year frequency, 24-hour duration design storm, meaning that detention facilities are required to provide storage for all critical storm events, up to and including the 100 year, 24-hour storm. A one-foot minimum freeboard above the maximum calculated high-water elevation must also be provided for all detention facilities.

Onsite detention with filtration is required for the first inch of runoff for sites less than 100 acres in size and for the first 1-1/2 inches of runoff for sites greater than 100 acres in size. As required by Chapter 62-25 of the Florida Administrative Code, these requirements are fifty percent greater than standard requirements, due to the fact that stormwater in Milton discharges directly into a designated Outstanding Florida Water, the Blackwater River. The following figure shows the City of Milton's Stormwater system:

Figure 6.3.2:
City of Milton Stormwater System, 2012



City of Milton, Department of Planning and Development, 2012,
* Stormwater Drainage Inlet data is incomplete

In order to assure the availability of public facilities consistent with the Future Land Use Map, the City of Milton will coordinate the extension of or the increase in capacity of facilities necessary to meet future needs through the adoption, implementation, and annual review of the Capital Improvements Element of the Comprehensive Plan. The City has recently completed a number of stormwater projects and is nearly finished with a sewer project in the east Bagdad area.

The City's adopted Stormwater Management Ordinance # 1178-05 specifies procedures whereby those developments that protect, enhance, or utilize natural drainage features will be given preference when issuing building permits. The alteration of natural drainage features will be prohibited unless no economically feasible development alternatives exist, adequate man-made drainage facilities are designed and installed in accordance with the adopted Stormwater Management Ordinance, and the required permits are obtained from the Florida Department of Environmental Protection, Army Corps of Engineers and Northwest Florida Water Management District. The City of Milton Comprehensive Plan includes a policy which addresses water quality standards for stormwater discharge. This policy will be reviewed and amended if necessary. Florida Administrative Code 9J-5.011(2) requires that the infrastructure element contain a policy establishing water quality standards for stormwater discharge. The City of Milton in keeping with the established standard of Santa Rosa County requires and enforces a finished floor elevation of 12" above the designated flood zone. Finally the City of Milton reviews changes to the county's local hazard mitigation strategy for incorporation into the City's Comprehensive Plan continually.

E. GOALS, OBJECTIVES, AND POLICIES

GOAL 1: THE PROVISION OF AN ENVIRONMENTALLY SAFE AND EFFICIENT STORMWATER MANAGEMENT SYSTEM THAT SERVES TO PROTECT THE PROPERTY OF THE CITIZENS OF THE CITY OF MILTON WHILE PRESERVING WATER QUALITY.

OBJECTIVE 1.1: CORRECT EXISTING FACILITIES DEFICIENCIES, IF ANY, BY IMPLEMENTING POLICIES 1.1.1 THROUGH 1.1.3, AMONG OTHERS.

POLICY 1.1.1: The City shall continue its practice of not issuing development permits for projects not meeting the design criteria for correcting existing deficiencies or meeting future drainage requirements.

POLICY 1.1.2: The City shall continue its practice of correcting localized drainage problems so that LOS standards are maintained.

POLICY 1.1.3: The City shall continue its periodic inspection program of stormwater control structures to ensure the proper functioning of such structures.

OBJECTIVE 1.2: TO COORDINATE THE INCREASE IN CAPACITY OF STORMWATER FACILITIES WITH MEETING FUTURE NEEDS.

POLICY 1.2.1: Installation of stormwater management facilities made necessary by new development shall be the responsibility of the developer.

POLICY 1.2.2: The City shall continue to enforce regulations in the LDR containing LOS standards for drainage stormwater management and water quality.

POLICY 1.2.3: The LOS standards for drainage and water quality shall be:

Retain the first inch of run-off; and

Post development run-off shall not exceed the pre-development run-off rate for all storm events, up to and including an event with a 24-hour duration, 100 year return frequency.

Post development run-off in constrained basins shall not exceed the pre-development run-off rate for a 10-year storm even during all storm events, up to and including an event with a 24-hour duration, 100 year return frequency.

POLICY 1.2.4: There shall be no reduction in the flood storage capacity or the other natural functions and values of the floodplain in the City of Milton in areas designated as regulatory floodway by FEMA Flood Insurance studies in the City of Milton. Encroachments shall be prohibited within designated regulatory floodway including, but not limited to, fill and new construction and development improvements that would result in any increase in flood levels.

POLICY 1.2.5: The City shall regulate development within the flood prone areas to minimize flood storage capacity reduction so that post development equals pre-development standards, which will afford protection to life and property within the floodplain.

POLICY 1.2.6: The City shall require that stormwater management facilities meet or exceed the adopted LOS, and that capacity is available concurrent with the impacts of the development.

POLICY 1.2.7: Where soil conditions and land use permit, the City may require the use of swale drainage on all new roadways or drainage easements.

OBJECTIVE 1.3: EXISTING DRAINAGE FEATURES (FACILITIES) SHALL BE UTILIZED WHENEVER SUFFICIENT CAPACITY IS AVAILABLE WITHIN SUCH FEATURES AND TO DISCOURAGE URBAN SPRAWL. UTILIZATION OF NATURAL DRAINAGE FEATURES SHALL BE REQUIRED WHEN SUCH USE DOES NOT IMPACT SENSITIVE NATURAL RESOURCES.

POLICY 1.3.1: Site specific development plans will be required to protect natural drainage features and incorporate such features into the site planning and development process.

POLICY 1.3.2: The use, storage, transmission or generation of hazardous substances, or substances which may artificially accelerate the eutrophication of wetlands and/or water bodies, shall be prohibited within wetland systems and shall be reported.

POTABLE WATER SUB-ELEMENT

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 the City of Milton, the average daily usage of potable water is 93.6 gallons per person per day (GPCD). With the rapid growth rate of Santa Rosa County and the City of Milton, 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 City of Milton Potable Water Sub-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.

1. *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, county, and city regulations. The Data and Analysis section identifies the condition of the City's existing utility systems, both public and private.

The Potable Water Needs and Assessments section describes the City'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.

2. *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 as follows:

The *Future Land Use Element*, as an overall blueprint for managing growth in the City, 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 City'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 City 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 City'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.

A. TERMS AND CONCEPTS

Terms included in this element 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 the City of Milton is 2.31 persons (2.31 persons per household based on 2007-2011 American Community Survey). 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 the City of Milton.

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 (NFWFMD) 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.

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.

1. 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 the City of Milton, 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.

2. 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 mode 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 2.31 persons per household, an equivalent way of expressing the LOS standard is:

LOS = 231 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 3.98 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 future capacity needs for a facility can therefore be projected.

B. EXISTING REGULATORY FRAMEWORK

1. *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.

2. 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 62-560 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 Health, 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. The City of Milton 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 includes:

- 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 the City of Milton 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 City.

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 revitalization, 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.

3. 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.

The City of Milton falls within the Northwest Florida Water Management District (NFWWMD). The NFWWMD 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 Milton 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 District's 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.

C. GOALS, OBJECTIVES, AND POLICIES

The Goals, Objectives, and Policies associated with this sub-element are clearly stated in the following Water Supply Facilities Plan.

NATURAL GROUNDWATER AQUIFER RECHARGE SUB-ELEMENT

INTRODUCTION

The purpose of the City of Milton Natural Groundwater Aquifer Recharge Sub-Element is to describe the existing groundwater conditions, issues, and concerns and to provide the background necessary to understanding the goals, objectives, and policies related to groundwater and aquifer recharge. The analysis of the existing conditions and future needs serves as a basis for formulating suitable recommendations concerning the management of natural groundwater aquifer recharge areas.

1. Relationship to Other Elements of the Comprehensive Plan

There are several key linkages between the Natural Groundwater Aquifer Recharge Sub-Element and other Elements of the Comprehensive Plan which include the following:

The *Future Land Use Element* is an overall blueprint for managing growth in the City; it defines the direction and intensity of future growth and development. The future land use types and intensities will have a direct impact on runoff and infiltration rates and in turn Groundwater quality

The *Conservation Element* identifies all of the City'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 discussing 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 City collaboration and coordination with other agencies and units of government, such as, the Northwest Florida Water Management District, Santa Rosa County, the Florida Department of Environmental Protection and the U.S. Environmental Protection Agency (EPA) to protect our groundwater resources and to meet the needs of the City of Milton.

The *Capital Improvements Element* will reflect the City's strategy for delivery of infrastructure and other public services, and will serve a primary role in growth management and help shape future aquifer recharge area management strategies.

The *Infrastructure Element* consists of five sub-elements, which include Potable Water, Sanitary Sewer, Stormwater Management, Solid Waste and this Natural Aquifer Groundwater Recharge. Together, these sub-elements will impact the development patterns within the City of Milton into the planning horizon.

A. TERMS AND CONCEPTS

Aquifers are water-bearing layers of porous rock, sand, and/or gravel. Aquifer recharge is a hydrologic process whereby rainwater and/or surface water moves downward from the surface to these water-bearing layers. A recharge area or zone is an expanse of land in which water can infiltrate into an aquifer with relative ease. This infiltration acts to replenish the aquifer. An aquifer's potentiometric surface is the potential height of the aquifer otherwise known as the water table.

The areas of highest recharge potential are called prime recharge areas. The presence of overlying confining beds also determines which surface areas will be effective recharge areas for a given aquifer, and is another factor in identifying prime recharge areas for the aquifer. Since aquifer recharge areas are surface features, they are subject to alteration by development. Covering recharge areas with impervious surfaces, such as roads, parking lots and buildings reduces the area available for rainfall percolation, altering the total rate and volume of recharge in that area. Increasing the rate at which stormwater drains from recharge area surfaces also decreases recharge potential.

A second concern related to development within aquifer recharge areas is the potential for contamination of groundwater within the aquifer. Just as with stormwater runoff to surface water, pollutants picked up by runoff which enters an aquifer can degrade the quality of the groundwater. Since water flows within an aquifer in a manner similar to surface water flow, downstream portions of the groundwater may be polluted over time. This becomes particularly significant when the aquifer is tapped as a potable water supply downstream.

B. REGULATORY FRAMEWORK

1. Federal

In 1986, the Federal Safe Drinking Water Act (PL 93-523) was amended to strengthen protection of public water system well-fields and aquifers that are the sole source of drinking water for a community. The amendments for wellfield protection require states to work with local governments to map wellhead areas and develop land use controls that will provide long-term protection from contamination for these areas. The aquifer protection amendments require EPA to develop criteria for selecting critical aquifer protection areas. Once a plan is approved, EPA may enter in to an agreement with the local government to implement the plan.

2. State

In implementing the Florida Safe Drinking Water Act (Chapter 403, F.S.), the FDEP has developed rules classifying aquifers and regulating their use (Chapter 62, F.A.C.). These rules have been amended to strengthen the protection of sole source aquifers and wellfields. The FDEP has also established regulatory requirements for facilities which discharge to groundwater (Chapter 62, F.A.C.) and which inject materials directly underground (Chapter 62, F.A.C.).

The task of identifying the nature and extent of groundwater resources available within the State has been delegated to the Regional Water Management Districts. Each district must prepare and make available to local governments a comprehensive water management plan which the local governments are to use to plan for future development in a manner which reflects the limits of available resources. The criteria for the management plan and legislative intent for their use, are found in Chapter 373, Florida Statutes and Chapter 62 F.A.C. Each Water Management District shall develop a comprehensive water management plan covering those areas deemed appropriate by the governing board. District Plans shall address, at minimum, the following subjects:

(A) District overview;

(B) Water management goals;

(C) Water management responsibilities, including:

1. Water supply protection and management, to include source protection and regional water supply planning;

2. Flood protection and floodplain management. This shall include the District's strategies and priorities for managing facilities and floodplains, and a schedule for District mapping of floodplains;

3. Water quality protection and management for both surface water and ground water. This shall include the District's strategies, priorities, and schedules to develop pollutant load reduction goals and any basin-specific rules as needed to assure that a TMDL is met; and

4. Natural systems protection and management. This shall reflect the schedule for establishing minimum flows and levels required by Section 373.0421, F.S.

(D) For each water management responsibility, the following shall be included:

1. Resource assessments, including identification of regionally significant water resource issues and problems within the District;

2. Water management policies for identified issues and problems; and

3. Implementation strategies for each issue and problem, including tasks, schedules, responsible entities, and measurable benchmarks.

(E) Integrated plan, describing how the water problems of each county in the District are identified and addressed;

(F) Intergovernmental coordination, including measures to implement the plan through coordination with the plans and programs of local, regional, state and federal agencies and governments; and

(G) Procedures for plan development, including definitions and public participation.

It is the intent of the Legislature that future growth and development planning reflect the limitations of the available groundwater or other available water supplies (Sec. 373.0395, F.S.). The Florida Legislature has also directed local governments to include topographic maps of areas designated by the Water Management Districts as prime recharge areas for the Floridian or Biscayne aquifers in local comprehensive plans, and to give special consideration to these areas in zoning and land use decisions (Section 163.3177 (6)(c), F.S.).

3. Northwest Florida Water Management District

The Northwest Florida Water Management District comprehensive water management plan includes the following strategic priorities:

- (A) Alternative Water Supply Development (AWSD)
- (B) Coastal Utilities Interconnections
- (C) Consumptive Use Permitting
- (D) Cumulative Impacts Analysis
- (E) Environmental Resource Permitting (ERP)
- (F) No Net Loss of Wetland Function
- (G) Flood Hazard Mapping
- (H) Reuse of Reclaimed Water
- (I) Restoration
- (J) Lands Management

4. Santa Rosa County

In 2010, Santa Rosa County established a Wellfield Protection Zone and Ordinance encompassing approximately 27,000 acres just east of the City limits for the purpose of protecting aquifer recharge areas and in turn groundwater quality.

5. City of Milton

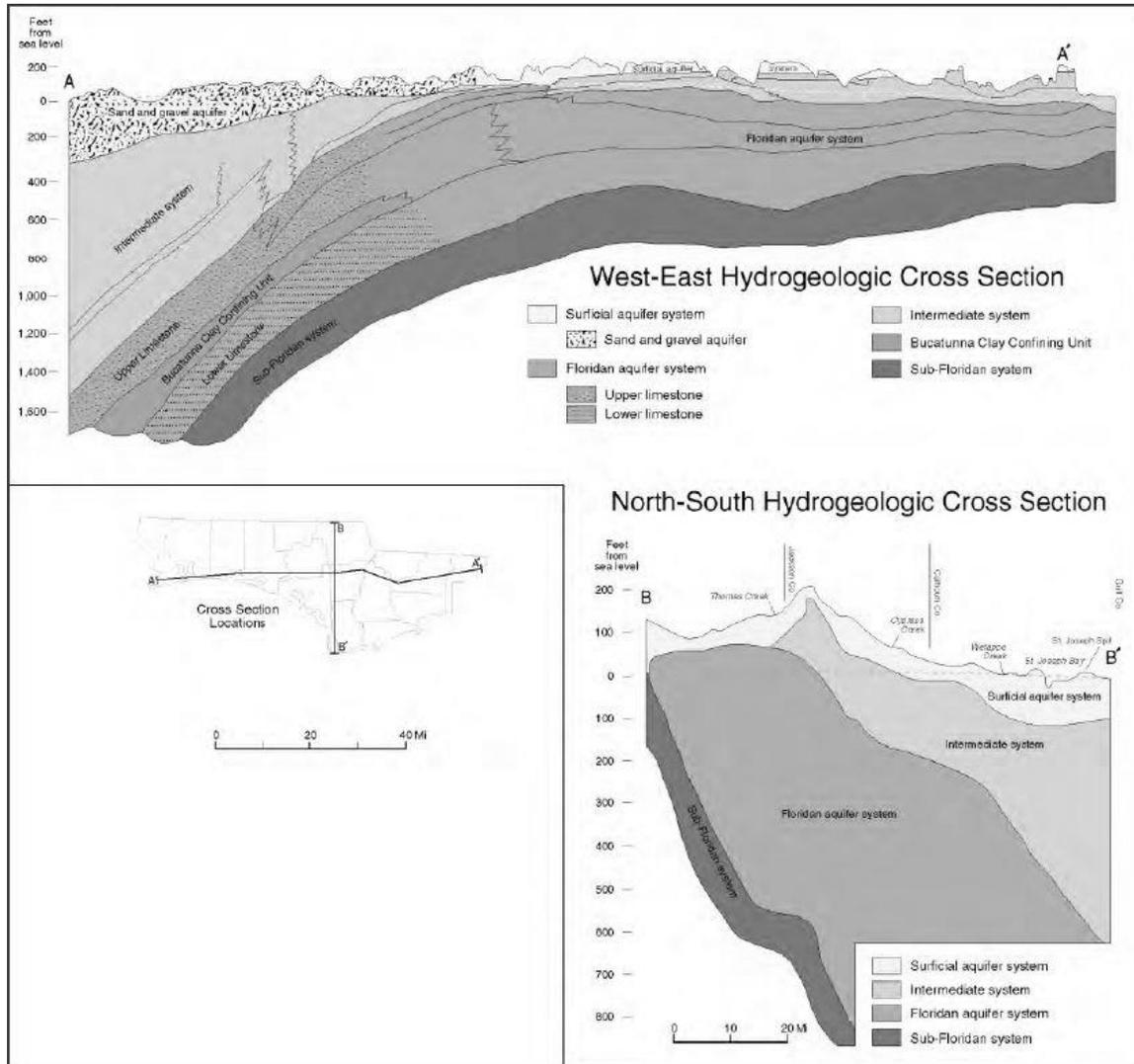
The City of Milton regulates the land use, as per Florida Department of Environmental Protection and Northwest Florida Water Management District specifications, of all land within a five-hundred (500) foot radius of existing and proposed well heads. As mentioned in previous sections the City also employs the use of vegetative buffer zones around environmentally sensitive lands including aquifer recharge zones. The city has also implemented a number of stormwater regulations that serve to protect sensitive areas and water resources

C. EXISTING CONDITIONS

The groundwater system underlying Santa Rosa County generally consists of two aquifers:

- (1) The Sand and Gravel Aquifer, and
- (2) The Upper Floridian Aquifer.

Figure 6.5.1: Regional Aquifer Cross Section



Strategic Water Management Plan, 2011, NFWMD

1. *The Sand and Gravel Aquifer System:*

The Sand and Gravel Aquifer exists throughout portions of Northwest Florida and Southern Alabama. It plays a vital role in meeting the potable water needs of the region, supplying upwards of 100 million gallons per day. The aquifer is what's known as an unconfined surficial aquifer, and it consists of varying and complex stratified silts, clays, sands, and gravels. The water table, which sits just below the land surface, can be easily found throughout most parts of the County. It is open to infiltration from rainfall in varying degrees and depending on the percolation characteristics of surface soils and the extent of impervious surfaces can be easily contaminated. The majority of rainfall infiltrating the water table travels in a southeasterly direction from higher elevations to natural discharge areas such as lakes, streams, and wetlands

2. *The Upper Floridian Aquifer:*

The upper Floridian Aquifer lies below the Sand and Gravel Aquifer and is separated by confining layers with relatively low permeability. Depth to the base of the Floridian aquifer in the Milton area is approximately between 1000 and 1500 feet below the land surface.

D. ISSUES AND ANALYSIS

Current groundwater issues in the Northwest Florida region include:

- long term depression of the potentiometric surface;
- Groundwater aquifer quality alteration;
- Reduction in available recharge area;
- Reduced groundwater discharge to surface water bodies

The sandy composition of most parts of the aquifer tends to limit mineralization. Chloride concentrations are highest in the coastal areas where salt water mixes to varying degrees with the fresh water of the aquifer (eg. south Santa Rosa and Okaloosa Counties). Water throughout the Sand and Gravel Aquifer contains carbon dioxide obtained from the atmosphere and from decomposition of organic matter in the sediments. The weak carbonic acid produced through the breakdown processes of carbon dioxide gives the water a low pH (from 4.0 to 6.9) that can cause slight corrosion of metals unless it is buffered before use. Individual on-site household wastewater disposal units can also contribute to aquifer degradation. This is an important source for potential contamination of groundwater pumped by private wells.

Considerable discharge from the Sand and Gravel Aquifer occurs where streams, such as the Blackwater River, Big Coldwater Creek, and other surface waters in and around Milton, cut into the aquifer. Groundwater is continuously discharged into the beds of most of the major streams in northwest Florida.

Development patterns within the City are expected to remain relatively constant and stable into the foreseeable planning future. The major impacts to groundwater aquifer recharge areas will occur in the urbanized and urbanizing areas of the City. Increases in impervious surfaces will

reduce the available aquifer recharge areas. Groundwater quality will also be impacted. To offset this impact, the City's stormwater drainage regulations emphasize the preservation of natural drainage features and the use of drainage retention structures to maximize aquifer recharge. As stated earlier in this element and in previous elements, the city regulates land use around wellheads and protects recharge areas through buffer zones. The City also encourages the re-use of treated effluent for irrigation in urban areas to increase recharge of the aquifer. The City incorporates provisions in its land development regulations requiring conservation of areas with the greatest recharge potential.

The City will work in cooperation with the Northwest Florida Water Management District, Santa Rosa County, and the FDEP to ensure proper aquifer recharge area protection and management.

E. GOALS, OBJECTIVES, AND POLICIES

The Goals, Objectives, and Policies associated with the Natural Groundwater Aquifer Recharge Element are clearly stated in previous sections. See Conservation Element, Objective 1.2 and Infrastructure Element, Sanitary Sewer Sub-Element, Goal 1.