PUBLIC FACILITIES – APALACHICOLA
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CONTENTS

Tables and Figures

A. SANITARY SEWER SUB-ELEMENT

Terms and Concepts

Local Facilities

Local facilities are medium sized sanitary sewer systems which generally provide service to small communities. These facilities are comprised of three components which perform the basic functions of collection, .treatment and disposal of sewage.

The collection system is composed of a network of pipes which collect sewage (also called wastewater) from individual establishments and convey it to a central location for treatment. The collection network is generally laid out in a pattern roughly analogous to the branching pattern of a tree. Figure A-l illustrates this pattern and the terminology applied to sewers within the system. This classification scheme identifies sewers according to their location within the network and not according to their size. Since sewage flow within the network is from the periphery toward the treatment plant, this scheme allows for easy identification of downstream components which will be affected by sewage flows from a peripheral area.

The major components of the collection network are the trunk mains and interceptors. Interceptors are defined as sewers which connect directly to and convey sewage to the treatment plant. Trunk mains are defined as sewers which connect directly to and convey sewage to an interceptor.

Due to the relatively level terrain of Franklin County, a pumping system is used in conjunction with the major components of the regional collection systems. This allows sewage to be conveyed under pressure against the force of gravity and for long distances at minimal slopes. The pump stations of these systems will be addressed as necessary in the element. In conjunction with this type of system, the term "force main" is often applied to pressurized sewers without regard to their location within the network (see figure A-l).

The treatment plant is the component of the local sanitary sewer facility which functions to remove soluble and insoluble materials from the sewage. There are a large number of processes which can accomplish this, but they are generally grouped into one of the following three categories depending on the proportion of materials removed:

1) Primary Treatment - This refers to the removal of between 30 and 35 percent of the organic materials and up to 50 percent of the solids from the sewage. This is also commonly referred to

as physical treatment because screens and settling tanks are the most common methods used to remove the solids.

2) Secondary Treatment - Secondary treatment processes remove between 80 and 90 percent of total organic materials and suspended solids from sewage. This level of treatment generally requires multiple steps involving one biological process and one or more processes for removal of suspended 'solids.

3) Tertiary Treatment - Sewage may also contain large quantities of synthetic organic compounds or inorganic chemicals which may create pollution problems if not removed. Tertiary (or advanced) treatment adds steps to primary and secondary processes to remove these pollutants. The most common tertiary process removes dissolved forms of phosphorus and nitrogen. The effluent of advanced treatment processes is of very high quality and often approaches potable water purity.

Septic Tanks

Septic tank systems are usually used to serve single housing units/ although relatively large-scale systems have proven successful. The system consists of two components, the septic tank and the drainfield. The tank receives wastewater from the home and provides a period of settling, during which time a significant portion of the suspended solids settle out. The settled solids are gradually decomposed by bacteria in the tank. The remaining liquid is discharged through underground drainage pipes into the drainfield and percolates into the soil where microorganisms and filtration processes purify the liquids. Septic tanks generally require cleaning every three to five years to remove accumulated solids. These solids, called septage, are generally transported to regional sanitary sewer facilities for treatment prior to disposal.

Regulatory Framework

Federal

The Federal Water Pollution Control Act Amendments (PL 92-500} is the controlling national legislation relating to the provision of sanitary sewer service. The goal of this act is the restoration and/or maintenance of the chemical, physical and biological integrity of the nation's waters. The act established the national policy of implementing area-wide waste treatment and management programs to ensure adequate control of sources of pollutants. Under Section 201 of PL 92-500, grants are made available to local governments to construct facilities to treat "point sources" of pollution, which include effluent from sewage treatment processes. The U.S. Environmental Protection Agency is responsible for implementing the act.

State

The Florida Department of Environmental Regulation (DER) is responsible for ensuring that the State carries out responsibilities assigned to it under PL 92--500. DER has adopted rules for the regulation of wastewater facilities in Chapter 17-6, F.A.C. These rules apply to facilities which treat flows exceeding 5,000 gallons per day for domestic establishment, 3,000 gallons per day for food service establishments, and where the sewage contains industrial or toxic or hazardous chemical wastes.

The Florida Department of Health and Rehabilitative Services (HRS) regulates septic tank and drainfield installations within the State. These requirements have been adopted by rule in Chapter 10D-6, F.A.C.

Local

In addition to the requirements imposed by HRS, Apalachicola Land Development Code regulates the installation of septic tanks. Septic tank installation is permitted by the Franklin County Public Health Unit which also is responsible for inspection and approval after installation.

Apalachicola Land Development Regulations address the on-site sewage disposal systems (OSDS) identified by the Franklin County Public Health Unit that do not comply with Chapter 10D-6 F.A.C. The ordinance requires the repair of malfunctioning OSDS's and provides for notification and penalties for non-compliance.

The projected total septic tank population and loading for the County are relatively small. For these reasons, and in the interests of conservative design, the Apalachicola plant design provides capacity for all projected septic tank wastes from the county to the Year 2000.

A review of U.S. Soil Conservation Service (SCS) maps indicates that most of the soils in Franklin County place severe limitations on the use of septic tanks. Wet soils and tidal flooding are the most common limiting factors. Only in the coastal fringes (0 to 6 miles from the coast) are marginal soils conditions found. Even in these areas, high groundwater tables and rapidly perking soils limit the treatment effectiveness of septic tank drainfields. Since the SCS map generalizes the type and extent of soils and their limitations, and variability does exist within each soil association, the suitability of a site for a septic tank is subject to individual review.

In April, 1988, the Florida Department of Health and Rehabilitative Services reported on its survey of septic tank soil absorption systems in the Apalachicola Bay area to determine their suitability as on-site sevage treatment systems. A house-to-house, property-to-property survey was conducted of all non-sewer areas of the County to determine the type and conditions of on-site disposal systems being used (see Figure A-2).

Each on-site sevage disposal system was rated based on Chapter 1OD-6, F.A.C., Standards for On-site Sewage Treatment Systems. A number rating was assigned for each of three categories: setback from surface waters, setback from private wells, and condition/installation.

The Apalachicola survey area consists of approximately ten square miles, including the City of Apalachicola, area to the north along State Road 384, Bluff Road (Southland Subdivision, Highland Parks, Bay City Road, Waddell Road, and Gibson Road), and west along U.S. 98 (Gulf Colony Subdivision, Pine Street, Oyster Road, Brownsville Road, and the area along U. S. 98 known as Two Mile).

Of the 751 systems surveyed, 292, representing 39%, were rated unsatisfactory. Areas of primary concern are:

Pine Street and Oyster Road - large number of failures and illegal systems

Two Mile (U.S. 98 West) - Critical Shoreline District

Highland Park, Bluff Road (S.R. 384) - large number of failures and illegal systems

Most of this area has a high water table (0-1.5 feet), soils with poor drainage and severe limitations for standard subsurface on-site sewage disposal systems. This is a generalization of the soil types and water table; some sections have a lower water table and are rated only slightly limited for septic tanks. Funds have been appropriated to assist low income families in making repairs. Most of these problems are outside the City limits, with only 9 being identified within Apalachicola City Limits. (See Map A, Page 4A)

1.) BACKGROUND

The City of Apalachicola is situated on the coast of the Gulf of Mexico, at the mouth of the Apalachicola River, in Franklin County, Florida. The land surface elevations are low and the terrain is flat to gently sloping. Dominant soils are loose quartz sands. The area has numerous densely wooded swamps, poorly defined creeks and extremely shallow water tables. Surface soils are underlain by a shallow, non-artesian aquifer. At greater depths, the artesian Florida aquifer provides water to public water supply wells. The ground water in the Apalachicola area is highly mineralized (more than 700 mg/1 total dissolved solids) and quite hard (more than 400 mg/1 total hardness), with significant chloride concentrations (120 mg/1, more or less).

The outstanding natural feature of the region is the Apalachicola Fiver and Bay. The river, largest in Florida, provides freshwater, organic and nutrients in adequate quantities and proper balance which ideally suit conditions for oyster growth. The Apalachicola Bay produces more than ninety percent (90%) of Florida's commercially harvested oysters.

Once a thriving seaport, where cotton from Georgia and Alabama plantations was warehoused and shipped, the City presently is oriented strongly toward a fishing and seafood processing economy. Interior portions of Franklin County, north of Apalachicola, are utilized primarily for commercial timberland and secondarily for national forests and wildlife preserves.

The City is under enforcement action by the U.S. Environmental Protection Agency (EPA) and the Florida Department of Environmental Regulation (DER) regarding the City's sewerage facilities. Excessive infiltration and inflow (I/I) entering the wastewater collection system hydraulically overloads the treatment plant. Also, the wastewater is diluted to the extent that the plant cannot achieve the percentage reduction of total suspended solids required by the federal discharge permit. The FPA issued an Administrative Order in 1988 which established an interim limit. The City has received funding to rehabilitate the collection system and to construct a new treatment facility. The new plant was necessary to replace the failing plant which could no longer be allowed to discharge effluent to Scipio Creek.

The FDER issued an experimental exemption for the City's new plant to discharge to a wetland area The City violated the exemption by failing to monitor wetlands as required. In August, 1987, the FDER issued a Consent Order which placed a moratorium on connections to the sewerage system due to the hydraulic overloading at the plant, overflows from the polishing pond, and the structural failure of the new oxidation ditch which was built as part of the new treatment facility. The State Legislature appropriated money in 1987 to correct these problems.

The outfall has been modified, but high bids on the oxidation ditch replacement have delayed construction. The City's engineers anticipate completion of the sewer system evaluation, design, and rehabilitation by May, 1991. The remaining design of the collection system extensions could take place during this time. Construction of the new lines would require one year.

In 1984, Apalachicola requested State grant funds to extend its collection system. The area to be served included all incorporated areas not currently having sewer connections (Greater Apalachicola), the U.S. 98/Brownsville Road area, and the Bluff Road area. However, due to the connection moratorium, the Department's District Office required further sewer rehabilitation prior to permitting the new collection system which is outside the City limits. No written agreement exists with the County for providing services within their jurisdiction This is discussed in the Intergovernmental Coordination Element.

Construction was completed July 28, 1988 and consisted of Pump Stations 1 and 2, the Scipio Creek lift station, 55 service connections, approximately 6,900 linear feet of gravity collection line, and approximately 10,200 linear feet of force main.

The Department of Environmental Regulation evaluated the treatment plant flow records following substantial completion of the rehabilitation work. On July 22, 1989 the Department responded to the City's request to connect new users by allowing up to 70,OOO gallons per day new flow in the collection system. The City must comply with the Department's Consent Order and continue to document proper treatment at the plant before additional connections will be considered.

Construction began in July 1989 on two pump stations, 179 service connection, approximately 24,000 feet of gravity line, and approximately 1100 feet of force main. Completion is scheduled for December 1989. Future construction of collection lines beyond this phase cannot take place until the consent order is resolved, particularly the reduction of infiltration and inflow. The City recently passed an ordinance increasing user fees to reflect actual operating costs.

2). EXISTING CONDITIONS

The City of Apalachicola owns and operates the largest municipal wastewater treatment facilities in Franklin County and provides sewer service to 988 connections. The franchise area includes some areas outside the corporate limits (see Figures A-3, A-4, & A-5).

The Apalachicola Wastewater Treatment Plant includes a 1.0 mgd oxidation ditch facility placed into operation during May, 1985. The secondary treated effluent from this facility is discharged through an artificial wetlands to the Whortleberry Creek. The treatment plant receives primarily domestic wastewater with only a minimal contribution from commercial establishments. Industrial contributors of wastewater are

National Pollutant Discharge Elimination Permit No. FL0038857. At present/ the facility is operating without a valid FDER Operating Permit. Wastewater is collected by approximately 12.8 miles of gravity sewer and is transported to the treatment plant through pump stations and force main.

Under current wastewater technologies, however, effluent disposal is the limiting factor. The wetlands disposal in current operation was permitted under a variance to the discharge rules and permitting of additional discharge or construction to increase the discharge would now fall under the Wetland Protection Act of 1984 and the resultant regulations in Chapter 17-6, F.A.C. Paragraph 17-6.055(2) states:

(2) The discharge of domestic wastewater effluent shall not be permitted where the :

(a) wetlands are within Outstanding Florida Waters as listed in Section 17-3.041, F.A.C.;
(b) wetlands are within Class I or Class II waters;
(c) wetlands are within areas designated as areas of critical state concern as of October 1, 1985
(d) herbaceous ground cover constitutes more than 30% of the uppermost stratum of the proposed treatment wetland, unless this herbaceous ground cover is composed of 75% Typha sp. (cattail). This prohibition shall not apply in hydrologically altered wetlands;
(e) discharge from the proposed treatment wetland is within an upstream annual average travel time of 24 hours of a lake, estuary, lagoon, Outstanding Florida Water or an area designated as an area of critical state concern as of October 1, 1985, unless effluent limitations pursuant to paragraph 1 7-6.060(2)(a), F.A.C., have been established and can be met.

Monitoring of the level of treated effluent is now taking place. Significant damage has not yet occurred to the natural resources (the titi swamp). Long term discharge to the wetlands will eventually over nutrify the swamp and it will become a cattail marsh.
Discharge of the effluent to the titi swamp is the only cost effective method of effluent disposal available to the City due to the high water table. The Department of Environmental Regulation is working with the City to monitor water quality and to insure that no suspended solids reach Apalachicola Bay.

An evaluation of the sewer system was conducted to locate and quantify the infiltration and inflow and to recommend cost-effective rehabilitation methods.
Three hundred twenty (320) sources of infiltration/inflow were located, of which 234 are cost-effective to rehabilitate at an estimated cost of $228/234. The cost to rehabilitate all leaks is estimated to be $355,818.

Tentative rehabilitation selections and estimated removal rates indicate that approximately 36% of infiltration and 80% of inflow con be removed from the Apalachicola system.

Numerous problems such as root intrusion, build-up, broken steps, surcharge, etc., wore noted throughout this system. These problems reduce the efficiency and safety of the system.

A cleaning and televising program should be conducted on a]! segments determined to be cost-effective. This will cost approximately $50,000 depending on the amount of heavy cleaning encountered. This will confirm main line sources of I/I as well as specific rehabilitation methods to correct the problems.

A thorough maintenance program should be developed to improve the safety and efficiency of the system and to prevent reoccurrence of the problems.

When the new oxidation ditch is completed, the old ditch could be converted to act as a flow equalizer ditch to divert flow through the plant for additional treatment. This would assist in reaching the desired treatment level as rehabilitation work occurs.

TABLE A-l
FLOW SUMMARY
APALACHICOLA, FLORIDA

	Total
Length (Feet)	88,982
Theo. Flow (MGD)	.485
Dry ADF	0.957
Infiltration	
Dry Weather (MGD)	0.572
Comp. HGW (MGD)	0.119
Total Infil. (MGD)	0.591
Infil. Rate (GPD/In-Mi)	4,196
Inflow	
Comp. Inflow (MGD)	0.182
Inflow Rate (GPD/LF)	2.05

The system evaluation revealed that the majority of infiltration and inflow is occurring in the main lines and from manholes in need of rehabilitation. A summary of the sewer flow developed during the evaluation of the system is shown in Table A-2

TABLE A-2
TOTAL REHABILITATION COST
TOTAL BY MINI-SYSTEM

MINI-SYSTEM	TOTAL REHABILITATION COST ($)	TOTAL MANHOLE AND MAINLINE REHABILITATION COST ($)	TOTAL MUNICIPAL SERVICE LINE REHABILITATION COST ($)	TOTAL PRIVATE SERVICE LINE REHABILITATION COST ($)
1	48,583	45,683	0	2,900
2	42,298	41,098	0	1,200
3	50,809	47,109	0	3,700
4	144,923	132,536	1,050	11,336
5	69,205	64,705	900	3,600
TOTAL	355,818	331,121	1,950	22,737
Source: Broward Davis and Associates, Inc. Tallahassee, FL 10/09/89.				

Treatment Facilities

The treatment facilities are designed for projected loading in the year 2000. Average daily flow rate and peak raw wastewater flow rate of 1.00 mgd and 2.80 mgd, respectively, are the bases for hydraulic design considerations. Process design is based on raw wastewater BOD 5 and TSS concentrations of 160 mg/l, each parameter, with corresponding daily loading of 1,334 pounds BOD5 and TSS.

The plant is designed to achieve secondary wastewater treatment, as defined by rule of the Department of Environmental Regulation, and effluent disinfection by chlorination. Reliability of treatment is enhanced by conservative design loading, operational simplicity, dualization of major treatment process units, on-site installation of standby power generation capabilities, and provision of an effluent polishing/holding pond and gravity flow.

Effluent Disposal Facilities

Design period is 20 years nominal, with 2000 being taken as design year for the effluent disposal facilities. Design flow is l00 mgd. The facilities are designed to accomplish secondary effluent polishing (increase removal of BOD 5, TSS and bacteria) and nutrient removals. Process mechanisms include filtration and chemical complexing of phosphorus during passage of the effluent through an aerobic, unsaturated soil zone; denitrification by biological activity in a fresh water marsh, precipitation of solids, bio-oxidation of organic and natural die off of fecal bacteria during sheet flow passage of effluent through a natural swamp system.

The plant and related effluent disposal system was constructed north of U.S. Highway 98 and west of Apalachicola Airport.

Existing Wastewater Flows and Characteristics

The existing wastewater treatment plant is now provided with a Parshall fulume and metering device. The design concept utilizes the following:

(1) Raw Watewater Screening
(2) Aerated Grit Chamber
(3) Oxidation Ditch
(4) Secondary Clarifiers
(5) Return/Waste Sludge Pumping
(6) Waste Sludge Thickener
(7) Drying Beds
(8) Chlorination
(9) Effluent Flow Measurement and Monitoring
(10) Chlorine Contact Chamber
(11) Effluent-Polishing/Holding Pond
(12) Plant Operations and Control Building
(13) Yard Pumping Station

MAP A SEPTIC TANK SUITABILITY

CITY LIMITS
LIMIT OF AREA SERVED BY SEPTIC TANKS

(14) Summary; Normal operation of the treatment facilities provide better than minimum secondary treatment. Average removals of BOD and TSS exceeds 9O5C, each parameter. Plant effluent is well nitrified and effectively disinfected. Chlorine contact chamber effluent entering the polishing/storage pond has a chlorine residual of O.5 to 1.0 mg/1.

3). NEEDS ASSESSMENT

This section examines the need for facility improvements during the planning period (199Q-2000). Improvement needs are based on demand for capacity to serve existing and projected population and land uses, and on the adequacy of facility performance in meeting health and safety objectives. Capacity needs are assessed for both centralized facilities and septic tank systems since these are the primary means of dealing with sewage in the City. The performance of all facility types is reviewed.

This assessment identifies facility improvement needs by estimating demands, assigning demand to the facilities and quantifying facility deficiencies.

Demand was estimated by applying the level of service standards for each facility to the projected population and land use within the service area in order to estimate average flows for the planning period. The average flows were then converted to peak flows by applying a peak flow coefficient derived from the maximum daily flow divided by the current average daily flow. Resident population estimates were based on the most current data provided by the University of Florida's Bureau of Economic and Business Research. Seasonal population estimates were based on site specific information gathered from the Future Land Use Element and development information provided by developers.

Demand assignments for each facility were based on current flow data and future demand was assigned assuming the same proportional distribution.

Facility capacity deficiencies were derived for years 1995 and 2OOO as the difference between the facility design capacity and assigned demand and are called residual capacity. Negative residual capacity indicates a capacity deficit (see Table A-3 for the population and capacity projections).

While no specific projected growth data for the Franklin County area provided sanitary sewer to be serviced by the Apalachicola sewerage facility, it is expected the current facility will continue to meet all needs through the year 2OOO. Currently there are no customers served outside the city. There are plans to provide sanitary sever to a prison work camp and to 5 to 10 commercial activities in Franklin County. This should occur during 1990-91. This will have minimal impact on the facility and further expansion in the county is not anticipated.

TABLE A-3
POPULATION & CAPACITY PROJECTIONS CITY OF APALACHICOLA

Planning Period	1986	1990	1995	2000
Population Projections	2, 613	2, 700	2, 923	2, 986
Design Capacity	1,000,000	1, 000, 000	1, 000, 000	1, 000, I

Gallons per day	843, 000	904,000	944,000	964,000
Residual capacity	157,000	96, 000	56,000	36,000

SOURCE: 1986 BEBR Bulletin No. 80 and DCA Planning Projections 1989.

Population

The population of Apalachicola has remained relatively stable for the last twenty-eight years. In fact, the population has experienced a 15 percent decline since 1960. While the majority of other coastal communities in Florida have experienced strong growth.

Methodology

These population figures were calculated by multiplying a constant 31.1% (the percentage during 1986) to the County BEBR Projections. Apalachicola future population figures are predicated on the assumption that the historical proportions of the County population is a trend which will continue for the forecast period (1990, 1995 and 2OOO).

Developmental Density

Typical, blocks in Apalachicola are 47O feet by 27O feet (center to center of the bounding streets). Avenues have 60-foot right-of-way and streets 50-foot rights-of-way so that usable area is 420 feet by 210 feet, each block. Deducting street rights-of-way (but not the alleys) and computing areas, it is determined that 60. 57. of total land area is developable as building lots. If residential lots are assumed to average 6,OOO square feet in net area (60' x 100' lots), at full development there will be 5 dwelling units per acre. At an average household size of 3.7 persons and at 5 dwelling units per acre, ultimate density is computed to be 15 persons per acre. Significant portions of total land area may be undevelopable because of low elevation, soil wetness, or commitment of area to such usages as transportation and communication system rights-of-way, institutional campuses, recreational areas, parks, cemeteries, and the like.

Apalachicola's seafood handling and processing establishments might be considered industries, rather than commercial establishments. In the present water billing and accounting system, however, they are included as either "retail stores" or "wholesale businesses". Consequently, their water use is included in the volume from which the "commercial" flow allowance was derived. No separate industrial flow allowance is considered necessary.

Future average day and maximum day sewage demands were estimated by the following method:

Average Day Demand = Customers X Level of Service Standard
Maximum Day Demand = Average Day Demand X Maximum Day to Average Day Demand Ratio

The level of service standards and maximum day-to-average day demand ratios for are shown on Table D-3. The projected customers for the service areas are shown in Table D-4. Table D-5 shows the projected sewage demand for the planning period.

TABLE D-3

LEVEL OF SERVICE STANDARDS AND MAXIMUM/AVERAGE DAY DEMAND RATIOS		
SERVICE AREA	LEVEL OF SERVICE STANDARD	MAXIMUM/AVERAGE DAY DEMAND RATIO
Apalachicola	400 gpd	1.33

TABLE D-4

PROJECTED SEWAGE SYSTEM POPULATION AND CUSTOMERS 1990 – 2000			
	Population		
SERVICE AREA	1990	1995	2000
Apalachicola	2700	2923	2986
	988	1032	1078

TABLE D-5
PROJECTED AVERAGE AND MAXIMUM DAY
SEWAGE DEMAND BY SERVICE AREA
1990-200O

	1990		1995		2000	
Service Area	Avg.	Max.	Avg.	Max.	Avg.	Max.
Apalachicola	395,200	525,616	412,800	549,024	431,200	573,496

There will be sewage treatment capacity of approximately 1,000,000 gallons per day available through the year 2000.

INFILTRATION AND INFLOW (I & I)

I & I has been a problem since the new sewage treatment facility became operational. This problem accounts for the difference between the "gallons per day" shown in Table A-3 and the LOS and projected sewage demand shown -in Tables D-3 and D-4. I & I is estimated to be in excess of 50/i of the effluent handles by the treatment facility. Correction of this problem is addressed in the capital improvement element.

MAPS

B. SOLID WASTE SUB-ELEMENT

1). BACKGROUND

Terms and Concepts

The purpose of this element is to examine the amount and type of solid waste and hazardous waste generated in Franklin County and the methods employed to dispose of it. Projections of the amount of solid waste that will be generated in 1995 and 2000 will be calculated based on the current amount of waste produced, the projected future population of the county, the future land uses, and other relevant data. These projections will be used to determine what facilities the county will need to provide and when the county will need to provide them to manage its solid waste in the future.

The materials dealt with in this element fall under the definition of "solid waste" adopted in Section 9J-5.003 (88), FAC, which reads:

"Solid waste" means sludge from a waste treatment works, water supply treatment plant, or air pollution control facility or garbage, rubbish, refuse, or other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from domestic, industrial, commercial, mining, agricultural, or governmental operations.

In addition, this element will also address "hazardous wastes" as defined in Section 9J-5.003 (34), FAC, which reads:

"Hazardous waste" means solid waste, or a combination of solid wastes, which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or may pose a substantial present or potential hazard to human health or the environment when improperly transported, disposed of, stored, treated or otherwise managed.

The State of Florida has adopted the U.S. Environmental Protection Agency's definition of hazardous waste. According to EPA a hazardous waste is a waste that has any of the following characteristics:

Ignitability; Waste which has a flash point less than 140 F and/or an aqueous solution with an alcohol content greater than or equal to 24 percent. Examples are solvents and paint thinners. Corrosivity; A liquid material which has a pH less than 2.0 or greater than 12.5. Examples are acids and caustics.

Reactivity; Waste materials which are reactive to water, shock, heat, and pressure fall into this category. Examples are peroxides and cyanides.

Toxicity; Various types of pesticides and heavy metals ' make up this category. Examples ate toxaphene and lead.

For the purposes of this element, the term "solid waste: excludes hazardous waste, which will be dealt with separately in this section. Solid waste includes the following classifications which indicate general characteristics of the materials and their sources of generation.
Residential wastes are mixed household wastes, including yard wastes, generated by the general population.

Commercial wastes are generated by the commercial and institutional sectors. Physical characteristics of these wastes are similar to those of residential wastes, in that they consist largely of combustible materials in the form of paper and food waste from offices, restaurants, retail establishments, schools, hospitals, motels, and churches.

Industrial wastes include wastes generated by industrial processes and manufacturing operations, excluding hazardous wastes, These wastes also include general industrial housekeeping and support activity wastes.

Special wastes include wastes having special characteristics or requiring special handling. These wastes include oversize bulky wastes and materials generated in demolition and construction projects.

Regulatory Framework Federal

The potential environmental impacts of solid waste facilities have led to the development of an extensive network of permitting requirements at the federal and state levels. Impacts on air and water quality are reviewed by the U.S. Environmental Protection Agency (EPA) and the Florida Department of Environmental Regulation (DER)/ and where dredging and filling might occur, by the U.S. Army Corps of Engineers (COE). The Regional Water Management Districts also provides state level review for water quality and quantity impacts. Actual construction and operation of solid waste -facilities requires further permits and review by DER. These federal and state regulatory responsibilities are summarized in Table B-l.

For hazardous waste, the national Resource Conservation and Recovery Act (RCPA) of 1976 directed EPA to develop a national program to regulate and manage hazardous waste and provide incentives for states to adopt consistent programs. The national Comprehensive Emergency Response and Compensation Liability Act (CERCLA), passed in 1980 provided EPA with authority and funds to respond to incidents requiring site clean-up and emergency mitigation (the EPA "Superfund" Program). This act also defined the liability of business engaged in hazardous waste generation, transport and disposal and provided enforcement processes.

State

In December, 1985, the Florida Department of Environmental Regulation implemented Rule 17-1, FAC, a stringent landfill closure rule and a revised landfill construction rule that includes specific criteria for the location, design/performance and operation/maintenance of sanitary landfills.

At the state level, the Florida Resource Recovery and Management Act (Sec. 403.7, F.S.), passed 1980, adopted federal guidelines and directed DER to develop and implement a hazardous waste management program. This act provided for: (1) adoption of federal hazardous waste definitions; (2) a system to monitor hazardous waste from generation to disposal; (3) annual inventory of large hazardous waste generators; (4) permit requirements regulating treatment, storage and disposal of hazardous waste; (5) funds for hazardous waste spill and site clean-up; (6) hazardous waste management facility site selection procedures; ands, (7) fines and penalties for violators.

Amendments to the Florida Act in 1983 provided directions and funds to establish a cooperative hazardous waste management program between local, regional, and state levels of government. These changes included provisions for county-level hazardous waste management assessments, regional and statewide facility needs assessments, and site selection for hazardous waste management facilities at the county, region, and state levels.

Local

A solid waste management plan v/as adopted by the Franklin County Board of County Commissioners in 1975. In July, 1987, a feasibility study on solid waste management funded by the Governor's Energy Office was completed. This study includes exploration of energy recovery through incineration of solid wastes as an alternative to conventional landfilling practices.

A hazardous waste management assessment was prepared for the county in November, 1986, by the Apalachee Regional Planning Council.

TABLE B-l: Federal and Solid Waste Applicable to Solid Waste Facilities

Description		Activity Where
Air Quality	Review Agency	Review is Applicable
New and Modified Source Review Requirements	DER, EPA	
1. Prevention of Significant Deterioration (PSD)	DER	Air emissions in attainment areas
2. New Source Review for Non-attainment	DER	Air emissions in non-attainment areas
Permit to Construct Air Pollution Sources	DER	Construction of air
Permit to Operate Air Pollution Sources	Review Agency	Operation of air pollution source (subsequent to testing)
Water Quality		Activity Where Review Is. Applicable
Permit to Dredge and Fill	DER, COE	Dredging and filling

		where possible effect on water quality
Permit to Construct Wastewater Discharge	DER	Discharge into state waters (construction of point source)
Permit to Construct Wastewater Discharge	DER	Discharge into state waters (operation)
Consumptive Use Permit	NWFWMD	Consumptive use of surface and ground-water and drilling of wells
Permit to Construct a Solid Waste Facility facilities	DER	Construction of Solid waste
Solid Waste		
Permit to Operate a Solid Waste Facility	DER	Activity Where Review Is Applicable Operation of solid waste facilities
Other		Activity Where Review Is Applicable
Certification of Proposed Electrical Power Generating Plant Site	DER	Any power plant over 50 MW. Optional for smaller facilities
Notice of Proposed Construction	FAA	Construction of a tall emissions stack
Environmental Impact Statement Provisions	EPS, COE OR OTHER	EIS requirements dependent upon federal involvement

The Franklin County landfill, located on State Road 65 approximately 2.5 miles north of U.S. Highway 98 is operated by the Franklin County Board of County Commissioners and serves all of Franklin County, including the cities of Apalachicola and Carabelle. The land uses in the service area are shown on Figures B-1A through B-1B. The land use element has predicted that there will be no change in the land uses within the county over the next decade.

Originally permitted by the Florida Department of Environmental Regulation (FDER) in March, 1980, as a Class I Solid Waste Resource Recovery and Management Facility, the present landfill has been operating without a permit since March 1, 1985. Now classified as a Class II facility, the landfill is currently operating under a consent order between Franklin County and FDER as a result of noncompliance with present solid waste regulations. One of the requirements of the consent order is that the present landfill cease operation by September 30, 1989.

Another requirement of the consent order was that the county examine alternative future methods of solid waste disposal. A Solid Waste Feasibility Study for Franklin County, Florida was completed by Baskerville-Donovan Engineers, Inc. in July 1987. This study examined the cost and feasibility of a landfill versus incineration. Based on this study the county chose to construct a new Class I landfill and an air curtain incinerator to reduce the volume of waste going into the Class III landfill. The air curtain incinerator will be used to burn wood waste, leaves, yard trash, and clean dry lumber only.

A forty acre site adjacent to the present landfill will be the location of the new county Class I landfill with a design capacity of 174,472 cubic yards. The Class III landfill and the air curtain incinerator will also be located on this site. There has been no proportional capacity allocated in the new landfill between Franklin County and the cities of Apalachicola and Carrabelle. The county is building and operating the landfill without any funds from the cities. Apalachicola and Carrabelle are allowed to use the landfill on the same basis as the rest of the citizens of Franklin County.

The county currently operates the landfill without charge to all county residents. The county has agreed to set up an escrow account for the new landfill and charge tipping fees. No fee schedule has been set.

The collection services in Franklin County are confined to the cities of Apalachicola and Carrabelle and the area of . Eastpoint and St. George Island. The rest of the county is served by a number of containers for collection of local waste.

These containers are transported to the landfill and emptied when they are full. Figure B-2 shows the location of each collection container and the existing and future landfill sites.

According to the Solid Waste Feasibility Study for Franklin County, Florida, prepared by Baskerville-Donovan Engineers, Inc. in July, 1987, the historic quantity of waste received at the landfill during the period 1980 through 1985 averaged 16 cubic yards per day. Population figures for Franklin County for 1980 and 1985 were 7661 and 8406, respectively, with a median population for the five year period of 8034. This indicates a solid waste generation rate of .054 cubic feet per capita per day. Using the figure of 900 pounds per cubic yard (compacted in place) stated in the Baskerville-Donovan plan, this converts into 1.8 pounds per capita per day. Baskerville-Donovan chose however to use the national average of 5 pounds per capita per day in computing the requirements for a future landfill.. The county has adopted this level of service of 5 pounds per capita per day as the local standard for solid waste.

The City of Apalachicola contracts with an independent firm to pick up all waste within the city limits. The contractor is paid by the City and the City bills each customer for collection. The contractor disposes of the waste at the Franklin County Solid Waste Facility. The County does not currently charge a fee for disposal of solid waste with the exception of construction debris. No allocation formula exists between the County and City and no written inter-local agreement has been signed between the City and County.

The Franklin County landfill is located near State Road 65, approximately 2.5 miles north of U.S. Highway 98. Originally permitted by the Florida Department of Environmental Regulation in March, 1980, as a Class I Solid Waste Resource Recovery and Management Facility. It currently serves a population of 8,498 and is classified as a Class II Landfill, in 1987, FDER agreed to allow interim operation of the facility by the County with certain conditions, one of which was that the present facility must close on or before September 1989. A forty acre site adjacent to the present landfill will be the location of the new County landfill with a design capacity of 174,472 cubic yards. Phase I has 4 cells approximately 520 feet long by 90 feet wide. The depth of each cell is approximately 8 feet deep. The landfill will be lined with a non-reinforced synthetic geomembrane liner to prevent leachate from downward or lateral movement into the surrounding soils or groundwater.

Any leachate produced will be collected through perforated laterals (pipes) located at the bottom of the landfill (just above the liner). The leachate will be transported via a leachate pump station to the Eastpoint Wastewater Treatment Plant.

Interior control of stormwater will be provided with a series of low stormwater control berms. Stormwater will be transported to the stormwater pond located along the perimeter of the landfill via a stormwater pump station. .

Cells will be filled with one lift of an average depth of 8 feet in thickness. The waste will be spread and is covered daily with soils to minimize odor, rodents, flies and other insects.

The amount and types of wastes will be controlled by the scale operator at the scalehouse located at the entrance of the landfill site. The scale operator will visually screen the incoming wastes to make sure hazardous wastes and other unapproved wastes are not disposed of in the landfill. All incoming waste will be weighed prior to disposal by a dual scale system. Each scale measures sixty (60) feet long by ten (10) feet wide and each has a capacity of 80,000 pounds.

The scalehouse operation will control future traffic patterns at the site. Landfill personnel will aid the general public at the manual unloading (public) ramp where sway cars are located to direct traffic, and when required, assist with maneuvering of trailers. Vehicles allowed to proceed to the active face of the landfill will be directed by County personnel. Manually discharging vehicles will be directed to the public ramp in order to avoid congesting the working face. Mechanically discharging vehicles will be routed directly to the working face.

Topographic Features

The average ground elevation of the site is 20-25 feet above sea level. General features are nearly level with slow surface run-off under natural conditions.

There are several cost categories involved in bringing the landfill operation into compliance with FDER regulations. These cost items include construction, equipment, and personnel. Construction operations would be contracted through the competitive bid process. Daily landfill operations of waste filling, compacting and applying cover (initial, final) material would be accomplished by County landfill personnel.

Additional equipment required at the landfill would include a crawler (tract) bulldozer with landfill blade for spreading and compacting both wastes and cover materials. This item would supplement the existing tract loader and dragline available on site. Additional personnel would include an equipment operator and an attendant/spotter to control and monitor incoming wastes to the landfill.

The equipment and personnel estimates are proposed minimum requirements and should be re-evaluated periodically.
Table B-2 contains a summary of the projected solid waste volume for the proposed landfill. Also included in the table is an estimate for population projections. This portion of the table is based on the landfill's expected life "Without Incineration".

The current county landfill is operating without a Florida Department of Environmental Regulation permit. A new county landfill is currently under construction and will be in operation by the time the current landfill is required to close on September 30, 1989. The new landfill will have a capacity of 174,472 cubic yards.

Table B-2 shows the amount of solid waste that is expected to be generated in Franklin County over the next ten years based on the projected populations. According to Table B-2 by the end of the first planning period in 1995 there will still remain 69,389 cubic yards of capacity in the landfill. By the end of the 2nd planning period in 2000 the capacity remaining in the landfill will have shrunk to 1,821 cubic yards. There will be sufficient capacity to handle all of the solid waste that will be generated during the first and second planning periods, but there will not be enough excess capacity left for the year after the second planning period. Therefore during the second planning period (1996-2000) the county should begin reviewing options on how solid waste will be handled in the years beyond 2000.

The 1988 Solid Waste Management Act mandated that by 1994 local governments reduce the volume of waste being placed in their landfills by 30%. Counties are also required to initiate a recycling program. Franklin County received a $61,296 Recycling and Education grant on June 12, 1989. Baskerville-Donovan Engineers, Inc. has been contracted to plan and implement a recycling and education program by October 1, 1989.

TABLE B-3 PROJECTED SOLID WASTE VOLUMES
Residual Capacity

Year	Population	Generation Rate	Annual Demand	Cumulative Demand	Residual Capacity
1989*	8875	5	4, 537	4, 537	169, 935
1990	9000	5	18, 250	22, 787	151,685
1991	9080	5	18, 412	41, 199	133, 273
1992	9160	5	18,574	59, 773	114,699
1993	9240	5	18,737	78,510	95, 962
1994	9320	5	13, 230	91, 74O	82, 732
1995	9400	5	13, 343	1O5, O83	69, 389
1996	944O	5	13, 400	118, 483	55, 989
1997	9480	5	13,457	131,940	42, 532
1998	9520	5	13, 513	145,453	29,019
1999	9560	5	13, 571	159,023	15, 448
20OO	9600	5	13, 627	172,651	1, 821

* 1989 annual demand is based on the three months (October, November, and December) the new landfill will be open that year. (Population projections are county-wide and include incorporated cities.)

Column Descriptions
Year - End of the year
Population - Extrapolated from Table 2, Land Use Element

Generation Rate - Pounds per capita per day Annual Demand - Cubic yards; the population times the generation rate times 365 days per year divided by 900 pounds per cubic yard; beginning in 1994 the annual demand is reduced by 3Q'/. as required by the 1988 Solid Waste Management Act Cumulative Demand - Cubic yards; the sum of all the previous annual demands Residual Capacity - Cubic yards; the amount of capacity remaining in the landfill based on a design capacity of 174,472 cubic yards. Source: Franklin County Planning Department, 1989.

The proposed landfill construction includes provisions contained in Chapter 17-7 F.A.C. except for the treatment and disposal of the collected leachate. A treatment and disposal leachate system located on the landfill site is not a feasible alternative. Therefore, a verbal agreement has been reached with the Eastpoint utility district to accept the leachate.

The County landfill will not accept items recognized as hazardous waste.
Hazardous Waste

In 1986, the Apalachee Regional Planning Council conducted an assessment of hazardous waste generation and management needs for Franklin County. It is estimated that 24.3 tons of hazardous wastes are generated annually in the county and that 11.1 tons (45.6%) are being reused/ recycled/ treated by private business, or otherwise managed properly. That leaves 13.2 tons (54.4%) of hazardous waste that is not being managed properly. Most of improper handling is due to waste picked up from the generating site by private/ city, or county hauler. Presumably this improperly handled waste ends up in the county landfill. Table B-3 summarizes the types of hazardous waste produced in the county and the disposal methods.

As part of the assessment, and in compliance with the requirements of Section 403.7225(4), F.S., Franklin County identified two areas within the county where hazardous waste transfer/temporary storage facilities could be located. The county landfill site in Section 22, Township 8 South, Range 6 West, and the County Road Department work camp in Section 15, Township 8 South, Range 6 West, were identified as the two potential hazardous waste storage sites in Franklin County. Both of these sites are located on State Road 65.

TABLE B-3 HAZARDOUS WASTE

Waste Type	Amount of Waste Properly Handled	Amount of Waste Improperly Handled	Total
Empty Pesticide Containers	0	72	72
Spent Solvent	224	2,090	2,314
Acids or Caustic	441	0	441
Photographic Waste	0	957	957
Lead-Acid Batteries	13,078	5,852	18,930
Waste Oils and Greases	8,436	17/541	25,977
TOTALS	22,179	26,512	.48,691

*A11 figures are given in pounds per year. Source: Franklin County Hazardous Waste Management Assessment, Apalachee Regional Planning Council, November, 1986.

3). NEEDS ASSESSMENT

Current Surpluses and Deficiencies Solid Waste

When it is necessary to build a new landfill it is probable that a new location will have to be found. A large residential development/ the Green Point Golf Resort Community, located on 540 acres at the intersection of U.S. Highway 98 and State Road 65 is currently undergoing a development of regional impact review by the state. This development is located adjacent to the current and future county landfills. When it is time to build a new landfill in the late 1990s it will probably be politically unfeasible to locate it in the same area.

The area between Eastpoint and Carrabelle is the most reasonable place for any landfill to be located.. This area is centrally located between the major population concentrations of the county. The area is only sparsely developed now. The limiting factor/ as throughout Franklin County/ will be the suitability of the soils.

Hazardous Waste

According to the November, 1986, Hazardous Waste Management Assessment, 22,179 pounds of hazardous waste are properly disposed of out of a total 48,691 tons produced in Franklin County. If the presumption is made that the ratio of hazardous waste produced to solid waste produced will remain constant, projections can be made about the amount of hazardous waste produced over the next ten years. Table B-4 shows the amount of hazardous waste that can be expected to be generated in Franklin County.

The table reveals that during the next decade 589/014 pounds of hazardous waste will be produced in the county. If current disposal practices continue only 45.6% of that waste will be properly managed. That leaves 320,424 pounds of hazardous waste that will not be properly managed. This amount will probably be disposed of in small quantities in the public sewers or at the county landfill. These disposal methods are not acceptable. All of the hazardous waste should be disposed of by approved, environmentally sound methods. Steps need to be taken to ensure that this occurs in the future. Possible steps that can be taken include public education of the dangers of improper disposal of hazardous waste and proper methods of disposal, locating stations where people can take their hazardous waste at convenient locations throughout the county, and imposing penalties for improper disposal of hazardous waste.

TABLE B-4 PROJECTED HAZARDOUS WASTE 1990-2000

Hazardous Waste Generated (in pounds)			
Year	Properly Managed	Improperly Managed	Total
1990	23, 515	28, 053	51, 568
1991	23, 723	28, 302	52, 025

1992	23, 932	28, 551	52, 483
1993	24, 142	28, 802	52, 944
1994	24, 351	29, 050	53, 401
1995	24, 56O	29, 299	53, 859
1996	24, 664	29, 424	54, 088
1997	24, 769	29, 548	54,317
1998	24, 873	29, 673	54, 546
1999	24, 978	29, 799	54, 777
2OOO	25, 083	29, 923	55, 006

Source: Franklin County Planning Department, 1989.

Performance Assessment Solid Waste

The current level of service for solid waste of 5 pounds per capita per day is adequate. The Solid Waste Feasibility Study for Franklin County, Florida, including the two cities, prepared by Baskerville-Donovan Engineers, Inc. in July, 1987, estimated that the operating level of service from 198O to 1985 was 1.8 pounds per capita per day based on average of 16 cubic yards of garbage per day received at the landfill, 900 pounds per cubic yard, and a mean population during those years of 8033.

The current county landfill, placed in operation in 1989 meets all DER requirements for a Class I landfill. With all of the environmental safeguards that are being incorporated into the new landfill the impact of the landfill on the adjacent natural resources will be minimal. The monitoring wells that are checking the quality of the groundwater around the landfill have shown no problems.

The new county landfill has a capacity of 174,472 cubic yards. This will be sufficient capacity to meet the county's (including city's) needs through the year 2000. In order to meet solid waste disposal needs beyond that time the County will need to develop additional landfill capacity or alternative disposal methods. Consideration of the site and method of future solid waste disposal should begin no later than 1996.

The land adjacent to the landfill is now zoned R-2 Single Family Mobile Homes and A-2 Forestry/Agriculture. The county's Future Land Use Maps do not predict any change in this designation.

Summary and Recommendations

Several recommendations for future solid waste management in Franklin County include the following:

1. Enact tipping fees at all solid waste facilities.
2. Enact an ordinance for fines for unauthorized dumping within the County.

Hazardous Waste Management

In 1985, the Legislature amended Section 403.7225, F.S., to require counties to update their hazardous waste management assessment every five years. The first such update is due in 1991 and will require the county to notify all small quantity generators of their management responsibilities. The county must forward waste generation and management information from this procedure to DER. Annual site verification of 20% of the generation will continue to be required. The Apalachee Regional Planning Council will continue to be contracted by Franklin County to handle these items.

Summary and Recommendations

The current county landfill will close by September 30, 1989, at which time the new county landfill will be open with a capacity of 174,472 cubic yards. This will be sufficient capacity to meet the county's needs through the year 2000. In order to meet solid waste disposal needs beyond that time the County will need to develop additional landfill capacity or alternative disposal methods. Consideration of the site and method of future solid waste disposal should begin no later than 1996.

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MAPS

C. DRAINAGE SUB-ELEMENT

Terms and Concepts Drainage Systems

Water flowing overland during and immediately following a storm event is called stormwater drainage or stormwater run-off. Under the effect of gravity, the drainage flows toward sea level through depressions and channels which comprise the drainage system of an area. The drainage system may consist of natural features, manmade features, or a combination of both.

Natural drainage systems are defined by the topography of an area. The largest feature of a natural drainage system is the drainage basin, or watershed. The boundary of the basin is called the basin divide. This is a line where the natural land elevation directs run-off from the basin toward a common major drainage feature, such as a river, lake or bay. The major drainage feature is often called the receiving body and the smaller features are its tributaries.

Manmade drainage facilities are artificial constructs designed to store or convey stormwater run-off. Swales, ditches, canals and storm sewers are typical conveyance structures, collecting stormwater run-off and directing it toward downstream receiving waters. Stormwater storage structures are generally classified as either detention or retention facilities. Detention facilities are designed to temporarily impound run-off and release it gradually to downstream portions of the drainage system through an outlet structure. Retention facilities are impoundment which release stormwater by evaporation and by percolation into the ground, with no direct discharge to surface waters.

Drainage and Stormwater Management

The occurrence of stormwater run-off is highly variable, dependent on the amount of rain falling during each storm event and on conditions within the drainage basin. Since most storm events are relatively moderate, natural drainage features typically evolve to accommodate moderate quantities of stormwater run-off. Occasionally, severe storm events create run-off volumes in excess of what these features can handle, resulting in temporary flooding of adjacent land. This periodic flooding is part of the natural cycle of events and often has beneficial effects on the basin ecosystem. Flooding is generally not perceived as a problem until development occurs in floodprone areas.

Historically, the typical strategy adopted in response to stormwater flooding of developed areas was to modify the drainage system to convey run-off away from developed sites more rapidly. Initially, this response may result in limited success in reducing nuisance effects and property damage. However, as urbanization of a drainage basin increases, storm events produce proportionately more and faster run-off, primarily due to the increase in impervious surfaces in the basin. As a result, the capacities of natural drainage features and previously constructed drainage facilities are exceeded more frequently and stormwater flooding problems increase, as do expenditures for further drainage improvements.

In addition to exacerbating flood problems, this strategy for coping with stormwater run-off has detrimental effects on water quality. Soil eroding from development sites, and materials such as oil, grease, pesticides and fertilizers from urban land uses are washed off by run-off, increasing pollutant loading on receiving waters. The increased velocity of run-off also disrupts natural drainage features by destabilizing channels, leading to further sediment loading and debris accumulation.

The term "stormwater management" refers to comprehensive strategies for dealing with stormwater quantity and quality issues. The central tenet of these strategies is to ensure that the volume, rate, timing and pollutant load of run-off after development is similar to that which occurred prior to development. To accomplish this, a combination of structural and non-structural techniques are utilized. Structural techniques emphasize detention and retention of stormwater to reduce run-off rates and provide settling and filtration of pollutants. Non-structural techniques emphasize preservation or simulation of natural drainage features to promote infiltration, filtering and slowing of run-off. The objective of stormwater management is to utilize the combination of techniques which provides adequate pollutant removal and flood protection in the most economical manner.

One of the key principles of current stormwater management techniques is recognition of the need for basin-wide planning. The stormwater management system must be designed beginning with the final outlet point to ensure adequate capacity to handle all discharges from the upstream portion of the basin under conditions that subsequent development upstream utilizes stormwater management techniques and systems which maintain predevelopment-development run-off conditions so that the downstream system is not overloaded. By ensuring that all development within the basin is based on and supportive of a plan for the entire basin, the functions and useful life of both natural and manmade components of the system will be protected and extended.

There are two basic factors involved in establishing a successful stormwater management program among these principles: (1) establishing and applying uniform design standards and procedures; and, (2) ensuring adequate maintenance of system components once they are constructed. The design standard which is of primary importance is the design storm event. This standard specifies the intensity (rate of rainfall) and duration of the rainfall event to be used in the design of facilities.

Data on rainfall intensity and duration have been summarized for various regions of the state by the Florida Department of Transportation (DOT) in graphs such as the one shown in Figure C-l. 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, 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-l applies, a 10-year frequency/3hour duration storm event would produce rainfall at an intensity of 1 inch per hour, a total of 5 inches for the event. Ideally, the selection of a standard design storm balances the cost of structures needed to avoid flooding against savings from reduced flood damage and disruption of community activities. The design storm must also be consistent with facility design for pollution abatement goals.

Standard procedures for sizing and designing facilities should also be part of the stormwater management program. This will ensure that systems are structurally and functionally compatible. The program should also provide for routine inspection and maintenance of facilities to ensure proper performance during facility life.

Regulatory Framework

Federal

Section 208 of the Federal Water Pollution Control Act (PL92-500, 1972) is the directing federal law with respect to water pollution abatement. In implementing the Act, the Environmental Protection Agency (EPA) identified pollutants carried in stormwater run-off as major source of water contamination. To achieve the pollution abatement goals of the act, EPA provided assistance to state and local governments to develop Area-wide Water Quality Management Plans, or "208 Plans" as they are commonly known. These 208 Plans studied a broad range of potential water pollution sources, including stormwater, and focused on identifying pollutant sources and abatement needs as well as development of regulatory programs to ensure implementation. At present, there are no federal regulations for stormwater management concerning the quantity of stormwater run-off.

State

The Florida Department of Environmental Regulation (DER) has adopted a Stormwater Rule (Ch. 17-25, F.A.C.) to fulfill part of the state's responsibilities under Section 208 of the Federal Water Pollution control Act. The rule's basic objective is to achieve 80-95 percent removal of stormwater pollutants before discharge to receiving waters. This rule requires treatment of the first inch of run-off for sites less than 100 acres in size and the first one-half inch of run-off for sites 100 acres or greater in size.

Treatment is generally accomplished through retention or through detention with filtration. Retention requires the diversion of the required volume of run-off to an impoundment are with no subsequent direct discharge to surface waters. Pollutant removal by settling and by percolation of the stormwater through the soil is almost total. Detention facilities are typically within the line of flow of the drainage system. Stormwater from a site passes through the detention facility and is filtered prior to discharge to remove pollutants.

Implementation of the stormwater rule is achieved through a permitting process. Exemptions to the permit requirements are provided for : 1) facilities serving individual sites for single-family, duplex, triplex or quadruplex units; 2) facilities serving dwelling unit sites which are less than ten acres in total land area, have less than two acres of impervious area, and which comply with local stormwater management regulations or discharge to a permitted regional facility; and 3) facilities for agricultural or silvicultural lands which have approved management plans.

Local

Apalachicola has adopted stormwater management regulations as part of the city's comprehensive land development code The Apalachicola Building official and Planning and Zoning Commission are responsible for implementing these provisions of the code.

2). EXISTING CONDITIONS

There is little information available concerning the . existing man-made stormwater drainage system installed in the City at this time. The existing pipes along 12th Street and 17th Street are 36 inches in diameter. Some pipes exist along Water Street and Bay Avenue and they are 18 inches in diameter. Most of the pipes out-fall into the river and bay. A grant has been secured to study this problem and make recommendations for corrective action but the results have not been published. The study area includes the drainage areas for Scipio, Huckleberry/ and Little Huckleberry Creeks. The drainage area of Scipio Creek is approximately 5 square miles of which 2.9 miles are main channel, with 2.7 miles of tributaries. The drainage area of Huckleberry Creek is approximately 15 square miles. There are 3.5 miles of main channel Whortleberry Creek on its upstream part and 2.4 miles of a tributary called Pine Log Creek. The drainage area of Little Huckleberry Creek is approximately 3 square miles. There are 2.6 miles of main channel. Much of the area is swampy with little opportunity for development of agricultural activities; however, the City of Apalachicola is directly affected by flooding from the three creeks being. studied.

The Soil Conservation Service is in the process of completing the following tasks:
1. Review all existing studies of the area and obtain rainfall and stream-flow records.
2. Run hydrologic and hydraulic models, survey bridges, culverts, and channel cross sections at Scipio Creek, Little Huckleberry Creek, and Huckleberry Creek: collect National Geodetic Vertical Datum. Inventory bridges and culverts; measure, invert elevations and record direction of water flow.
3. Determine the hydrologic boundaries of the watershed and sub-watersheds using aerial photo-maps. Determine the size, slope, soil type and land use for each sub-watershed.
4. Compute flood discharge and water surface profiles.
Analyze the 10-, 50-, 100- and 50-year frequency flood events.
5. Delineate and plot the water surface elevations on aerial photo-maps. Develop profiles at specific locations showing the elevations of the 10-, 50-, 100-, and 500-year frequency storms.
6. Prepare a final report describing the watershed including topographic and stream characteristics, flooding from past floods, potential flooding in -the future natural values and profiles showing stream stage tables with discharges and management options.

The final report by the Soil Conservation Service is scheduled for completion in January 1991. This study will be used to develop a flood plain management plan for the city. Funding for developing the drainage plan will be provided by DER and has been in the Capital Improvements Element of this comprehensive plan.

During the interim, drainage needs will be dealt with by permitting action utilizing the current stormwater management requirements which are a part of the Land Development Code for the city. Modifications to the code will be made when problem areas develop that are not properly covered. Current stormwater management requirements are considered adequate for the situation until the comprehensive SCS study is available.

Three major drainage basins divide Franklin County almost evenly into three portions: the Apalachicola River Basin, the Ochlockonee River Basin, and the New River watershed.. Surface drainage occurs through slow moving, meandering rivers and streams originating from the flat swamp areas (see figure C-2).

The rivers may be divided into two general classification; alluvial and blackwater. Alluvial rivers (the Apalachicola and Ochlockonee Rivers) are characterized by carrying heavy loads of sediment from upstream erosion. Hence, their waters are usually turbid and brown.

The Apalachicola River Basin spans from the Alabama-Florida state line to Apalachicola Bay and ranges in width from four miles to six miles. The drainage area encompasses 2, 29O square miles, all of which directly empties into the Gulf of Mexico via Apalachicola Bay.
The Apalachicola River drains into the Apalachicola Bay estuary. The Apalachicola Bay System is bounded on the south by a series of barrier Islands. It has a total area of about 212 square miles and is composed of East Bay, St. George Sound, Apalachicola Bay, and St. Vincent Sound. Approximately 20 square miles of marsh are associated with the estuary. The bay averages nine feet in depth at mean low water. Connections with the open Gulf consist of one dredged pass (Sike's Cut) and two natural channels (Indian Pass and West Pass) and the St. George Sound.

Elevations vary from mean sea level (M.S.L.) along the shoreline of Apalachicola River and Bay upward to approximately 2O feet, M.S.L. in the northwestern corner of the City. Generally, terrain is flat to very gently sloping.

A major portion all land in the basin is forested, with approximately open water areas accounting for 2.6% of the basin, followed by urban and developed areas with 1.9%. All other uses constitute 1.4% of the total.

The major river in the area, the Apalachicola River, empties into the Apalachicola Bay, which in turn empties into the Gulf of Mexico. The Apalachicola Delta is a good example of an arcuate arched type delta; the delta area of Franklin County also is very swampy and marshy.

Apalachicola is situated on the western bank of the Apalachicola River where the river enters the Apalachicola Bay. The Intercoastal Waterway is located in St. George Sound and Apalachicola Bay, south and east of the City' in the Apalachicola River northeast of the City ;' and in Jackson River and Lake Wimico northwest of the City. In actuality, the City is located at the eastern extremely of a peninsula bounded by the Intercoastal Waterway and the Apalachicola River on the north and east and by Apalachicola Bay and St. Vincent Sound on the south.

Topography and Drainage

Apalachicola's western city limit is a north-south line just west of 25th Avenue. The subdivided and platted portion of the City lies generally south of Bluff Road.

The incorporated area generally north of Bluff Road comprises wetlands along such waterways as Turtle Harbor, Scipio Creek and the Apalachicola River. Northwestern portions of Apalachicola drain northward through small local tributary streams to Apalachicola Bay. Older, more established, and eastern portions of the City are drained overland or through storm drainage systems, more or less directly to Apalachicola River and Bay.

Stormwater management will become increasingly more-important as the City develops and increases the amount of impervious surfaces. All development proposed within the Riverfront District must include a Stormwater Management Plan.

A recent survey of the Scipio Creek Area Watershed produced a map showing the location of Stormwater outlets and manholes that are located throughout the City (see figure C-l). Most of the outlets were completely or partially stopped up with trash or dirt. Some of the outlets could only be located by looking in the manholes and chasing out the pipe to said outlets. There were a number of manholes that could not be located because of the streets had been paved over them.

There are drainage ditches throughout the Scipio Creek Area Watershed that have grown up with bushes, trees, and water plants that stop the flow of water to their respective outlets. Most ditches have been cleaned out by the use of backhoes or excavators to the point that the bottom of ditches are well below the flow line of culverts under the roads and driveways which leaves standing water. This standing water creates places for stagnation of the water, that breeds mosquitoes and provides a place for alligators, snakes, fish, turtles, frogs, etc. to live and breed.

The ditches would serve a more useful purpose if pipe were placed in them with suitable outlets, and the ditches covered. This would keep out the trash, prevent the problems of snakes, alligators, and mosquitoes and stop the soil erosion.

Natural Drainage Features

Physiographically, Franklin County is situated in the Gulf Coastal lowlands. Southern, low-lying and coastal areas of Franklin County are located in the Apalachicola Coastal Lowlands.

Surface soils are generally light gray to buff colored loose quartz sands. Characteristically, the areas are essentially flat, sandy surfaces with numerous densely wooded swamps and few shallow, poorly-defined creeks. The area is underlain by sand and clay deposits nearly 80 feet thick. The ground water table is quite close to the ground surface, resulting in vast swampy expanses during wet weather periods.

The stratigraphy of the area is outlined below, with strata being listed in increasing order of age and depth. The shallowest and youngest stratum is the Choctawhatchee Stage of Miocene rock, a sedimentary formation of fine to coarse grain argillaceious sand and sandy shell marl. In the Apalachicola area, this stratum is underlain by the Chipola facies, Alum Bluff Stage, a blue-gray to yellowish-brown, highly fossiliferous marl. The next deeper stage in Franklin County is the Tampa Stage, comprising a calcareous St. Marks facies and a silty Chattahoochee facies. The Tampa Stage is comprised of sand, silts, marls, subordinate limestone, and fullers earth downdip. The Miocene strata, as enumerated above, are underlain by Oligocene limestones.

Factors Affecting Suitability for Development

In 1988, the USDA-Soil Conservation Service completed Soil Survey field work in Franklin County and Apalachicola. A published soil survey is scheduled for distribution in 1992, however a preliminary report will likely be available in the fall of 1989.

Soil Survey mapping involves delineation of segments of the landscape. Each item on the soil survey legend consists of a soil type (series) or group of soil types called a map unit. The map unit occurs on a particular landscape position, has a specified range of physical and chemical soil characteristics, and has specified range of physical and chemical soil characteristics, run-off and drainage potential, and natural vegetation. Certain map units are considered hydric, and delineations of these map units can be used to define the boundaries of wetlands. The soil survey is therefore a natural resource inventory that provides a considerable amount of natural resource data useful in land use planning.

The published soil survey provides interpretations and suitabilities for a wide variety of land uses. These interpretations are developed using the SCS National Soils Handbook, soils data from Florida and the S.E. United States, local data, and input from experts in variety of fields. Many soil limitations can be overcome by using appropriate site -modification. A soil that is poorly suited for septic tank absorption fields, for example, might accommodate a fully functioning drain-field using a mound of suitable thickness. Only those, soils rated as "unsuitable" for a particular land use, have limitations that should not be considered for modification.

Modification practices may involve expensive financial commitment/ creative engineering, and/or intensive labor. These practices however should have minimum impact on adjacent lands surface waters, and ground water.

In Apalachicola, the dominant restrictive soil features is the depth to the seasonal high water table (SHWT). About 29% of the soils in the City have a SHWT above the surface during the wettest time of the year. Development in these areas may lead to structural failure, unsanitary conditions, and redirected stormwater flow. About two thirds of these very poorly drained (VPD) soils are unsuitable for most land uses because of daily tidal flooding or seasonal river flooding. About one third of these very poorly drained soils are poorly suited for commercial and residential land uses. Low bearing strength is a limitation associated with VPD soils where organic soil materials have accumulated. VPD soils also have high corrosion potential for concrete and steel.

Poorly drained soils make up about 28 percent of the soils in Apalachicola. These soils have a SHWT from 0 to 18 inches below the ground surface. These areas are poorly soiled for commercial and residential development. Unaltered areas cannot support drain-fields and are corrosive to concrete and steel. In their natural condition, these poorly drained soils have a high run-off potential, despite moderate to rapid permeability rates. Run-off potential is high because of the low sub-surface storage area from a thin unsaturated zone between the soil surface and the water table.

About 8% of the soils in Apalachicola were mapped as highly altered soils. These areas consist primarily of marshes and swamps that were filled to accommodate industry along the Apalachicola River. The type of fill is extremely variable, but may include clean sand, oyster shells, garbage, bricks, cypress and pine mill by-products, and dredge spoil. Based on the average range of fill thickness, and the observed buried natural soil characteristics, these soils may be somewhat poorly drained (SPD) or poorly drained (PD). They have a SHWT from slightly above the surface to 20 inches below the surface. Permeability rates probably due to being compacted by heavy equipment traffic, routine vehicle traffic, and building or material weight placed on these areas. Thus, during periods of intense rainfall, surface ponding may occur in some areas. The unpredictable components and characteristics of these soils require careful site inspection during planning and construction phases of most projects.

About 32% of the soils in Apalachicola are moderately to well suited for most commercial projects. These deep sandy soils are slightly poor draining (SPD) to moderately well drained (MWD) with the SHWT ranging from 20 to 40 inches' and 40 to 72 inches respectively. The

SPD soils may present some problems due to water table depth during construction. They may also require mounding for septic tank absorption fields. Both soils have rapid permeability ratios/ and therefore use of these areas for development should consider any application or disposal of substances that might seep into adjacent waters. This concern should be addressed for all soils, however the moderately well drained (MWD) Resta soils are often located on areas of relatively greater relief in Apalachicola, and water table "draw down" may increase probability of seepage into coastal waters.

Because most of the soils in Apalachicola are sandy throughout, permeability rates are rapid. Also/ sandy soils have low catcon exchange capacity (CEE), that is the ability to absorb or chemically hold substances that are carried in solution by soil water. When used for residential/ a fertilization and pest management plan should be considered carefully.

Sulfur coated fertilizers, though expensive, are one type of "time released" fertilizer that is economical in the long term and reduces transport of fertilizers components. An integrated pest management (IPM) strategy should be considered for all development. IPM reduces the risk of water pollution through use of resistant plant varieties, use of less harmful pesticides, natural vegetation and other strategy that help limit the need for highly toxic pesticides.

Soil erosion is not a major problem in Apalachicola/ but should always be considered in the planning process.

Some areas along natural or man-made bluffs, may require stabilization. Two such prominent areas in the City have already been stabilized with vegetation. The old city dump site was stabilized during the Botanical Gardens project, and the Lafayette Park bluff was stabilized using SCS coastal plant material research plots. In any eroding areas stabilized by vegetation/ foot and recreational traffic should be limited in order to reduce plant mortality. Any development/ especially large projects, should attempt to leave as much natural vegetation intact, quickly stabilize cleared sites/ and limit sediment transport downslope from the site. Since even poorly drained sandy soils can become drought during periods of low rainfall, irrigation is recommended to quickly establish soil stabilizing vegetation. A variety of other erosion prevention and control practices can also be considered. Erosion control assistance should be obtained from a nearby field office of the Soil Conservation Service or a qualified engineer.

There are no prime farmland soils or highly credible soils in Apalachicola.

Soils of southwestern Franklin County in the Apalachicola area have been characterized as those of the Leon-Scranton-Ona Association and the Salt Water Marsh-Coastal Beach Association. The latter association occurs generally along and south of U.S. Highway 98 west of Apalachicola and in the wetland areas along Turtle Harbor, Scipio Creek and the Apalachicola River north of the City's developed area. Central and developed portions of the City are generally situated on soils of the Leon-Scranton-Ona Association. Briefly and generally, the three series which comprise this association are all poorly drained or somewhat poorly drained sandy soils. Surfaces are level to gently sloping. Depths to ground water table in the Leon and Ona series are 10-40 inches for about 6 months of the year, shallower than 20 inches for 1 to 4 months of the year and deeper than 40 inches in dry weather periods. Depressed areas in the Leon series may be ponded. In the Scranton series, drainage is poor, being impeded by slow surface run-off and seasonally high water table (0-1 feet for 1-2 months annually).

TABLE C-l
SOIL SUITABILITY FOR DEVELOPMENT IN APALACHICOLA

Map Unit #	Percent of Land Area	Drainage Class	Suitability for Development
4	5.3	VPD – tidal	unsuitable
5	8.3	PD – SPD	variable
7	11.4	VPD – tidal	unsuitable
11	0.6	VPD	unsuitable
15	0.6	MWD	well
20	0.5	PD	poor
22	21.8	PD	poor
23	1.2	VPD	unsuitable
24	25.9	SPD	moderate
25	1.2	VPD – Floodplain	unsuitable
29	5.8	MWD	well
30	0.1	VPD	poor
31	5.0	VPD	poor
33	5.3	PD	poor
36	4.2	VPD	unsuitable

VPD = Very poorly drained = +6 to 0
PD = Poorly drained = 0 to 18" SPD = Somewhat poorly drained = 18" to 36" MWD = Moderately well drained = 36" to 72" SHWT = Seasonal high water table
Source: Franklin County Soil Survey Office USDA - Soil Conservation Service

Salt Water Marsh-Coastal Beach Association
This association is composed of level, vety poorly drained soils subject to frequent flooding by tidal waters (salt water marsh) and deep droughty sands (coastal beach). These soils are unsuitable for anything but water related recreational use.

Wetland Resources

Wetlands in Apalachicola correlate highly with mapped areas of VPD soils. Approximately 29% of the land area in Apalachicola way be classified as wetland based on the occurrence of hydric soils. Some older areas of the City contain hydric soils which no longer support wetland vegetation. The surface hydrology of these areas has been altered by development, lawns, gardens, parking lots and buildings. Many of these areas are still prone to flooding or surface water ponding during periods of heavy rainfall . Most wetlands in Apalachicola do not have defined stream, channels, and surface water flow is intermittent.

Wetlands are located on the lowest landscape position in Apalachicola, and before development, most were connected to each other and the Bay arid River. They provided natural drainage for the area and many still function in this way. As o conduit for Stormwater, they allow a slower release to coastal waters. Natural vegetation plays an important role in trapping sediment and slowing water velocity. Vegetation also helps remove water through transpiration. Preservation and restoration of wetlands may assist in buffer stormwater release to the coastal waters.

Wetlands provide many aesthetic benefits and can be used for low impact recreational and educational activities. Interpretive boardwalks and bird watching structures in the coastal river marshes and swamps are examples. Increased public awareness and appreciation for the aesthetic/ environmental, and economic benefits of wetlands can lead to increased public support, .for natural resource planning and strategies.

NEEDS ASSESSMENT

Problems and Options

Effective Stormwater management plans need to incorporate a wide variety of data including, but not limited to : spatial distribution and occurrence of wetlands, wetland stormwater capacities, hydrologic characteristics of rivers, streams and coastal waters, soils characteristics such as permeability rates and run-off potential, vegetation, existing and planned development. Existing storm water structures, distribution and percentage of impermeable surfaces, and rainfall patterns. Some of this data has been presented in the Natural Resource Section of the Comprehensive plan; and in the published soils survey and soils conservation service flood plan management study to be published in the future.

The City's physiographic features contribute to the problem of managing surface Water - low elevation, damp soils, river floodplains and swamps.

The stormwater run-off from streets and highways of the City represents one of the most serious of pollutants which enter the natural surface waters. Preventing the direct run-off of these pollutants into Apalachicola Bay offers the most practical means of handling this problem Drainage facilities which retain run-off and filter out the pollutants should be provided as new streets are opened up and highways are improved.

All of the drainage facilities in the City consist of swales, ditches and culverts constructed in connection with roads.

Summary and Recommendations

In order to implement a program the city will need to 1) conclude master stormwater drainage studies currently being conducted under a NOAA Grant. 2) continue to regulate development to ensure that post-development stormwater run-off rates, volumes, and pollutant loads do not exceed pre-development conditions; 3) preserve natural drainage systems and, 4) provide adequate maintenance for the major drainage system and for on-site systems of individual developments.

By regulating future development to require that pre-development and post-development run-off characteristics are equivalent under equivalent rainfall conditions, the City can minimize future changes in the stormwater flow within the basin. Regular maintenance of man-made drainpipes, also extends the useful life of drainage facilities, reducing long-term repair and replacement costs. Once the NOA study is concluded, the City will take steps toward implementation of recommendations.

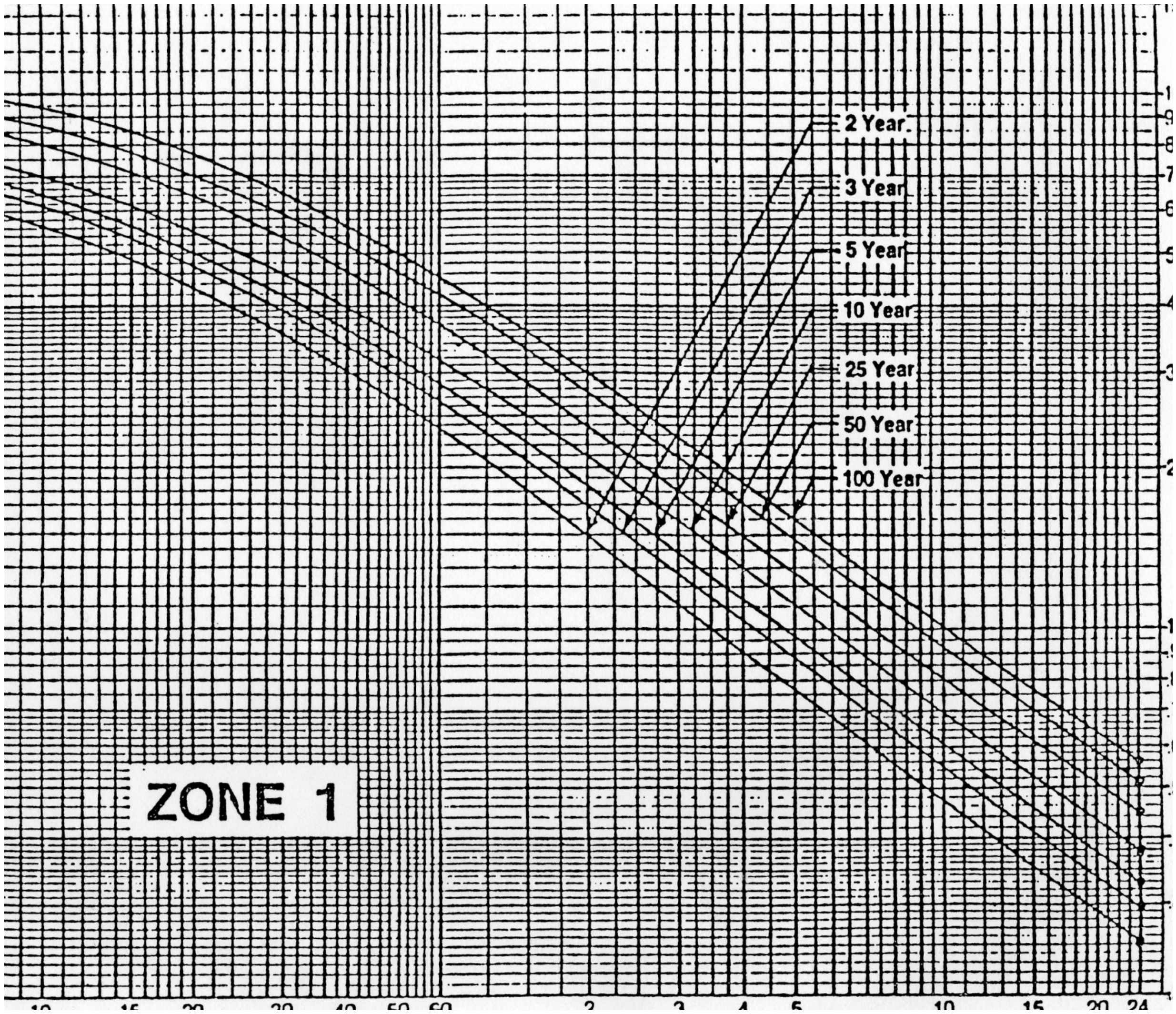
The provision for adequate drainage for future residential subdivision development shall be mandated in Stormwater Management Regulations. These regulations will require that all preliminary plats have the following information:

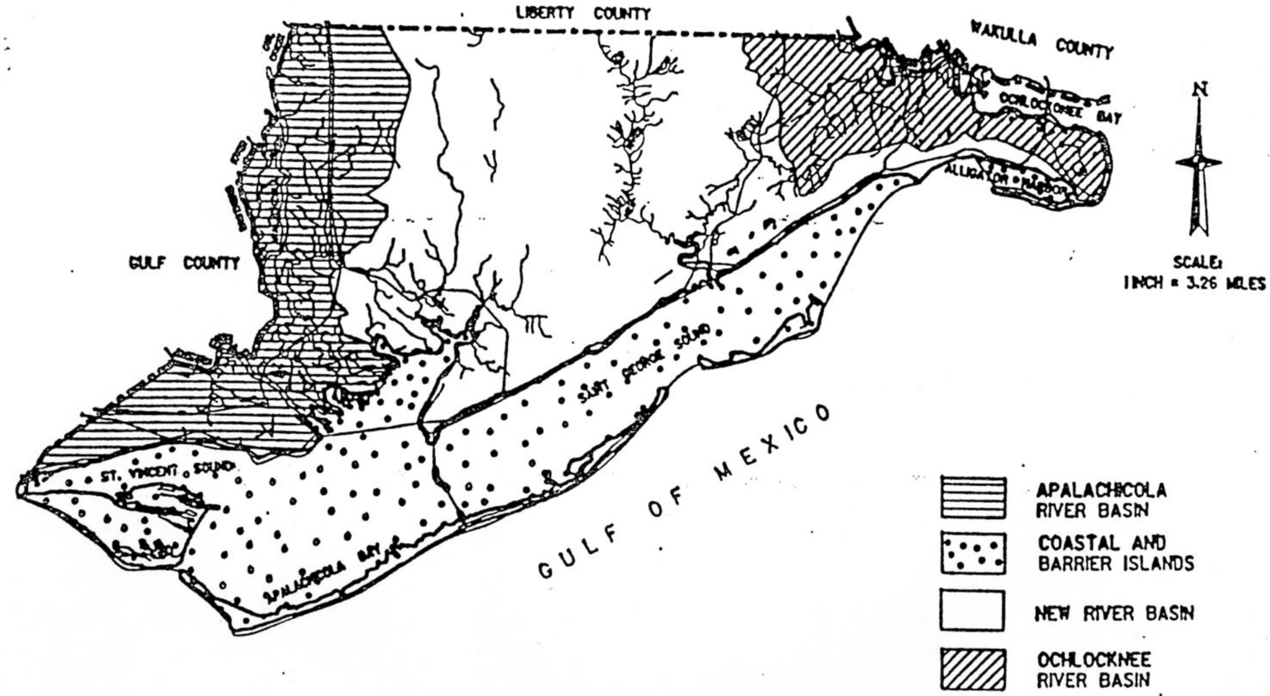
Topography of the entire plat showing contour lines at not more than two-feet intervals to show the relief to the land to be subdivided, except for areas whose slope is .so minimal that the commission may require one-foot intervals.

Proposed drainage plan, including ultimate destination of flow and storm drainage systems and retention area.

The ordinance will provide the general framework for planning of adequate stormwater drainage for major future developments.

The existing pipes which outfall to the bay need to be redirected or at a minimum, filtering devices should be added until rerouting can occur. The Department of Environmental Regulation has promised to assist the City in securing Federal grants to construct a stormwater management system.


2 Year
3 Year
5 Year
10 Year
25 Year
50 Year
100 Year
ZONE 1

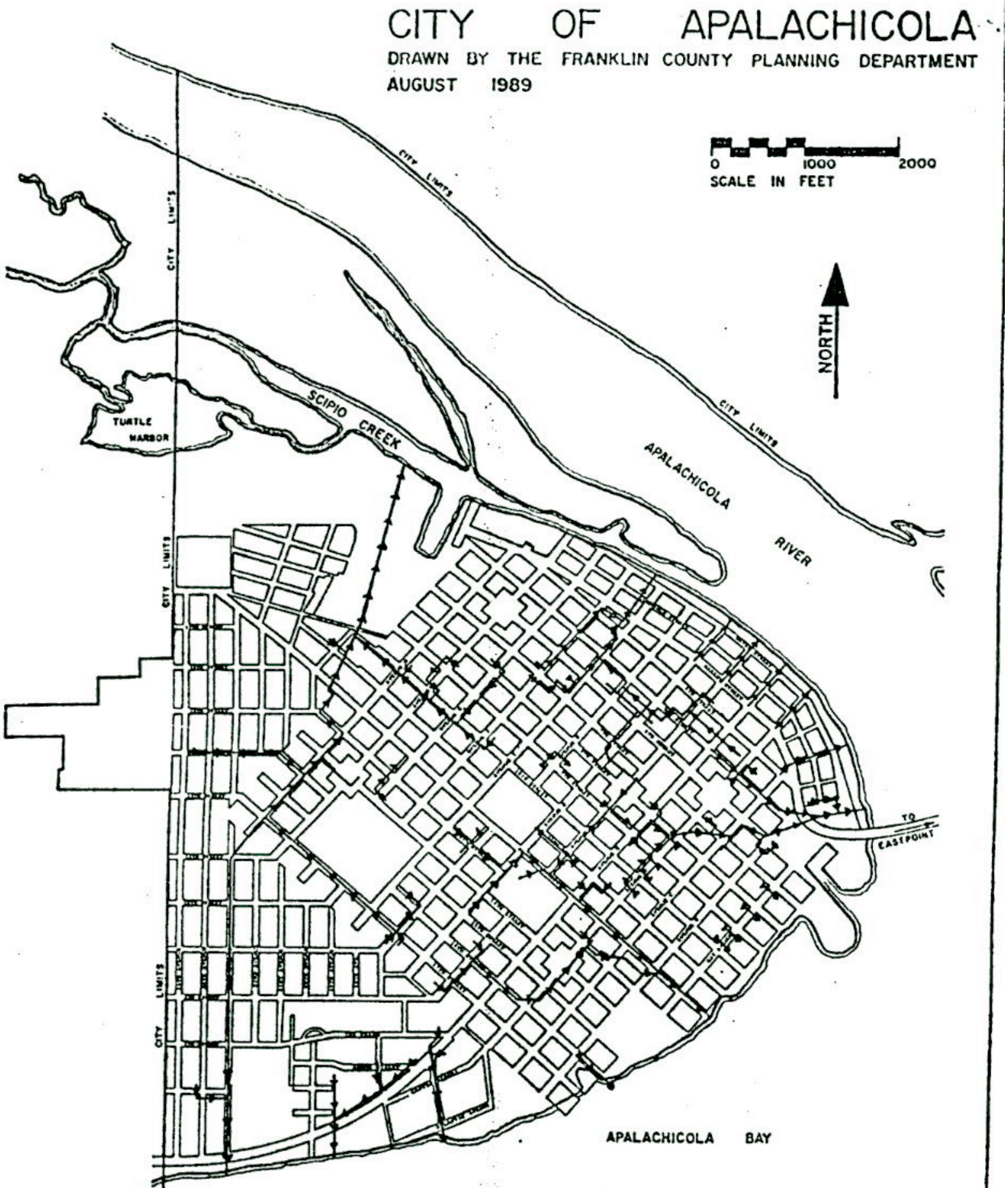


FRANKLIN COUNTY

MAP - MAJOR SURFACE WATER RESOURCES

PREPARED BY:
BASKERVILLE-DONOVAN ENGINEERS, INC.
DATE: NOVEMBER, 1987

FIGURE C-2



STORMWATER MANAGEMENT FACILITIES

STORMWATER MANAGEMENT FACILITIES

FIGURE C-3

D. POTABLE WATER SUB-ELEMENT

1). BACKGROUND Terms and Concepts

A potable water supply system normally consists of a water supply source, a treatment plant and a distribution and storage network. Either surface water/ stored in natural lakes or man made reservoirs/ or groundwater/ or some combination of the two usually constitute the supply source for a system. The selection of a source for any system must consider the type and quality of sources available and the cost of developing the source for use. Before being used for public consumption/ most water must be treated. 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 utilized.

After treatment, the water is supplied to individual users in a community by way of a network of pipes and storage reservoirs. 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 network should be interconnected to form flow loops to allow water to circulate from various portions of the system to areas of highest 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/ corresponding to periods of highest residential use. Localized demand peaks also occur when the system is utilized for fire fighting purposes. In order to provide adequate 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 from the tanks back into the system to augment flows and maintain pressure. Ground level and elevated storage tanks are both commonly used. Elevated tanks (water towers) are the most economical. Many systems also include auxiliary pumps which operate only during peak demand periods.

Regulatory Framework

Federal

The federal government has established quality standards for the protection of water for public use, including operating standards and quality controls for public water systems. These regulations are provided in the Safe Drinking Water Act/ Public Law 93-523. This law directed the Environmental Protection Agency (EPA) to establish minimum drinking water standards. The EPA standards are divided into "primary" (those required for public health) and "secondary" (recommended for aesthetic quality) categories.

State

In accordance with federal requirements, the Florida Legislature has adopted the Florida Safe Drinking Water Act, Sections 403.850 - 403.864, F.S. The Florida Department of Environmental Regulation (DER) is the state agency responsible for implementing and regulating public water systems under Chapter 17-22 of the F.A.C. The primary and secondary standards of the Federal Safe Drinking Water Act are mandatory in Florida.
The N.W. Florida Regional Water Management District (WMD) is responsible for managing water supplies to meet existing and future demands. Regulation of consumptive use is achieved through a permitting system, through which water resources are allocated among the permitted consumers. The WMD rules pertinent to Apalachicola are contained in Chapter 40D-2, F.A.C.

Local

Local Ordinance requires that all residents of Apalachicola must connect to the public water supply if it is within 1/4 of mile.

Ground Water

In Franklin County, as in most of northwestern Florida, the extensive artesian limestone aquifer (Floridan aquifer) is the predominant source of fresh water. This aquifer is comprised of the Ocala limestone and some of the limestones of the Eocene and overlying limestones of the Oligocene and Miocene.

The Floridan Aquifer is several hundred feet thick and is separated from the Surficial Aquifer by the intermediate confining system. The formations which comprise the intermediate system consists of sand, gravel, clays and low permeability carbonate materials. The other confining layer is the Sub-Floridan Confining Unit which underlies the Floridan Aquifer. Non-artesian aquifer, extending usually to less than 50 feet of depth, is also present in much of the area. Rural areas whose demands are quite small are often supplied by water from both.

The shallow aquifer and the Floridan aquifer are recharged by rainfall. There is little recharge in the Apalachicola area. Local areas where the surface is composed of permeable and porous materials,, and locations where the aquifer outcrops (as in Georgia and Alabama) are recharge areas for the Floridan aquifer.

In Franklin County, little water is used for industrial and agricultural purposes. Public systems are supplied water by well withdrawals from groundwater sources, generally the Floridan aquifer, and generally in volumes not exceeding 0.5 mgd. In the area, the top of the Floridan aquifer usually occurs at depth of 50-100 feet; it extends to a depth of nearly 750 feet. Apalachicola residents are supplied water through wells into the Floridan aquifer at depths of approximately 35O to 480 feet.

Ground water withdrawn from the Floridan aquifer in Apalachicola is highly mineralized. Total dissolved solids exceed 700 milligrams per liter (mg/1). The raw water may be characterized as very hard, with total hardness exceeding 400 mg/1. The effects of salt water intrusion into aquifer can be seen by chloride content of the ground water supply which approximates 120 mg/1. This information was provided in the Apalachicola 201 Study, 1979.

Surface Water

The major natural physical feature of the Apalachicola area is the Apalachicola River. This stream and its tributaries drain approximately 20,OOO square miles in the States of Florida, Georgia and Alabama. The river has been impounded near the town of chattahoochee, just below the confluence of the Flint and Chattahoochee Rivers, to form Lake Seminole a reservoir with nearly 60 square miles of water surface area. Water released at the Jim Woodruff Dam, which impounds Lake Seminole, forms the Apalachicola River. This stream flows approximately 107 miles through the State of Florida to its point of discharge through Apalachicola Bay to the Gulf of Mexico at Apalachicola. Average rate of fresh water inflow through the Bay to the Gulf is 23,460 cubic feet per second (cfs).

DER Quality Standards

The highest usage classification commonly assigned to surface water in Florida, particularly estuarine water, is Class II - Shellfish Harvesting. Major portions of the Apalachicola Bay system have been classified by the Florida Department of Environmental Regulation.

2). EXISTING CONDITIONS

The Apalachicola potable water supply system is owned and operated by the City of Apalachicola. The franchise area consists of the City limits and some areas just outside the City limits (see Figures D-l, D-2, & D-3). The City reports that 86 percent <1073) of the residential and 10O percent (110) of the commercial units are served. The average daily demand is nearly 600,OOO gallons. The maximum demand is approximately 800,000 gallons the design capacity is 2,088,OOO gpd. The Population served is 2,501. Ratio of Average Day demand to Maximum Day demand: 1.33.

The City of Apalachicola potable water system serves 287 customers located in Franklin County (outside of the city). Almost all of these customers are residential. There are no current plans to expand the system in the county and it is anticipated new customers will be added to the existing system by the year 200O, there will be no more than 125. The impact of these additions will be minimal. The part of the system in the county consist of water lines and has no impact on adjacent natural resources. (See Map D-2, page 53B)

TABLE D-l Water Distribution

Well Pump Capacity	Treatment	Storage	Distribution System
Well 1 600 gpm	Chlorination and aeration	200,000 gal elevated	Pipe sizes 2” to 12” operation pressure 58 psi
Well 2 600 gpm		400,000 gal ground storage tanks	
Well 3 200 gpm			

Table D-2 Water Facilities Apalachicola	
Design Capacity	2,088,000 gpd
Nwfwmd Consumptive Use Allocation	1,150,000 gpd
Current Average Demand	400,000 gpd
Average Daily Use	300 gpd
Population	2,700
Customer (Connections)	1,351

City of Apalachicola				
Planning Period	1986	1990	1995	2000
Population Projections	2,613	2,700	2,923	2,986
Customer Projections		1,351	1,410	1,472
Design Capacity	2,088,000	2,088,000	2,088,000	2,088,000
Gallons Per Day	229,000	405,330	423,600	441,600
Residual Capacity	1,859,000	1,665,000	1,665,000	1,646,400
SOURCE: 1986 BEBR Bulletin No. 80 and DCA Planning Projections 1989. Water Dept., City of Apalachicola, Fl				

Treatment

Treatment consists of chlorination of water supply as a means of bacteriological disinfection and aeration and settling to oxidize and remove hydrogen sulfide (H2S), a malodorous gas in the raw water.

No treatment is provided presently to reduce the raw water's hardness or high total dissolved solids concentrations.

At the Apalachicola water plant, service pumps take suction from the ground storage tank, impart pressure, and discharge water to the distribution system. Two pumps, capacities 1000 and 550 gpm, respectively, are available. The larger capacity unit can be driven by a gasoline engine to insure continuity of service pumping in the event of failure of the primary (electric) power source. Total installed service pump capacity is 1,500 gpm (2.232 mgd); while firm capacity, during power failure, is 1,000 gpm (1.440 mgd).

Elevated Storage

Water system facilities commonly include elevated storage facilities. Provision of elevated storage makes water available during mechanical failure or power outage. Also elevated storage can augment available flows from the water treatment plant during short periods of extreme high demands (for example, during a major fire). Water from elevated storage facilities can be passed through transmission and distribution mains to the point of its consumptive use, using energy which exits by virtue of elevation. This energy has been previously imparted by pumping the water into the elevated storage facility. However, since pumping is not required immediately prior to the time of usage (usually a critical peak demand period), elevated storage is considered much more reliable and desirable than ground storage facilities which require that service pumps be kept in operation. The reservoir's volume is adequate, a proposed force-draft aeration system, the reservoir will satisfactorily serve until the end of the planning period (year 2000). The existing 400,000 mg elevated storage tank's volume is adequate to serve the system's needs for storage to the year 2000;

Distribution System

Essentially all development within the city limits of the City of Apalachicola is served by the municipal water system. The distribution system has been developed in numerous construction and extension programs over many years. Presently, the system comprises approximately 92,090 linear feet (17.44 miles) of water main piping in sizes 1-inch through 10-inch diameters.

Main Diameter (In.)	Approximate Total Length (L.F.)
10	10,320
8	10.930
6	51,120
4	1,050
3	3, 200
2	15,100
1	370
Total	92,090

The tabulation above is reflective of transmission and distribution piping (finished water mains). Additionally, an 8-inch main approximately 2, 450 feet long connects Well. no. 3 to the existing water treatment plan and serves as a raw water main. Generally, the distribution system appears adequately valved and has 119 fire hydrants. Fire hydrants are provided at general spacings adequate and appropriate for protection of the property in the community from fires.

There is little definitive information available relative to the condition of piping in the distribution system. Parts of the system date from time periods when unlined or poorly lined iron pipe was used. Such portions of the system are known to have been subject to attack by corrosion; this conclusion is based on observation of "red water" when the system is flushed periodically. The City is gradually replacing these old pipes. It is suspected that hydraulic capacities of many existing mains have diminished, both as a result of reduced diameters and cross-sectional area reduction and increasing factors of resistance to flow caused by rust encrustations on interior surfaces of pipe barrels.

As indicated, replacement of some of the older pipes in the water system is desirable, probably necessary. Also the addition of storage capacity and the rehabilitation of existing storage and treatment facilities are planned. The capital improvement element includes provisions for this work. Further expansion and other new facilities are not planned.

Water Sales

When the City's 201 study was completed, sales were averaged and meter books maintained. Since then, inoperative meters have been replaced. Approximately 40 meters are inoperative and are being replaced as located.

Land Use

Within its corporate limits, the City of Apalachicola exhibits a mixture of land usages. Commercial establishments (primarily fishing and marine businesses) are located along the Apalachicola River waterfront in eastern portions of the City. Other commercial establishments are clustered in the older, downtown area and in a commercial strip along U.S. Highway 98. The primary use of land is residential.

c. Fire Flow Plus Average Day Demands

Maintenance of fire flow plus average day demand for a period of six hours is possible utilizing water from elevated storage and from service pumping capacity. The total demand rate is 3.498 mgd (2.88- + O.618). The plant includes degasification and second-stage precipitation facilities. Related facilities include a control and chemical feed building and laboratory, emergency standby generator and supervisory control system for wells, plant, tanks & service pumps, lime sludge lagoon and the existing chlorination system.

3. NEEDS ASSESSMENT

Capacity Assessment

Future needs have been evaluated on the basis of average day and maximum day demand factors based on historical records of annual water production for the various water supplies in Franklin County. Average day demand provides an estimate of resident population water demand and has been used to derive the level of service standards for the various water systems. Maximum day demand represents annual peak daily demand and provides an estimate of combined resident and seasonal population demand. Water production must be capable of meeting maximum day demands. Storage capacity is typically designed to augment flow and pressure for peak demand and fire-flow needs.

Population

Historically, both Franklin County and the City of Apalachicola have been lightly developed and sparsely populated. The County has exhibited slow growth over the past 3O years or so. However, numerous factors (the widespread occurrence of adverse terrain and soil wetness, the remote location of the County with respect to developmental stimuli, and the preponderant ownership of lands by commercial woodland products interests) in combination are expected to keep overall developmental density relatively sparse.

Future water demand Apalachicola was estimated based on current water customers and the most recent medium-range population projections for Franklin County provided by the University of Florida Bureau of Economic and Business Research.

Future average day and maximum day water demands were estimated by the following method:
Average Day Demand = Customers X Level of Service Standard
Maximum Day Demand = Average
Day Maximum Day to Average Day Demand X Demand Ratio

The level of service standards and maximum day-to-average day demand ratios for are shown in Table D-3. The projected populations for the service areas are shown in Table D-4. Table D-5 shows the projected water demand for the planning period.

TABLE D-3
LEVEL OF SERVICE STANDARDS
AND MAXIMUM/AVERAGE DAY DEMAND RATIOS

Apalachicola	300 gpd	1.33

TABLE D-4
PROJECTED POTABLE WATER SYSTEM CUSTOMERS
1990-2000

SERVICE AREA	1990	1995	2000
Apalachicola	1351	1410	1472

TABLE D-5
PROJECTED AVERAGE AND MAXIMUM DAY
WATER DEMAND BY SERVICE AREA
199O-200O

	1990		**1995**		**2000**	
Service Area	Avg.	Max	Avg.	Max	Avg.	Max
Apalachicola	405,300	538,916	423,000	562,590	441,600	587,328

There will be a water capacity of approximately 1,300,000 gallons per day available through the year 2000

In all these analysis and assessments, it needs to be recognized that there is a 46% loss in the system due to leakage, and not measured usages. This loss in the system is a part of the total water needed to be pumped to supply the customers their LOS needs.

E. NATURAL GROUNDWATER AQUIFER SUB-ELEMENT

Section	**Page**

1. BACKGROUND

Terms and Concepts

Aquifers are water-bearing layers of porous rock, sand or gravel. Several aquifers may be present below one surface location, separated by confining layers of materials which are impermeable or semipermeable to water.

The source of water in aquifers is rainfall. Under the force of gravity, rainfall percolates downward through porous surface soils to enter the aquifer strata. Because of the variable permeability of different soil types, the rate of aquifer recharge from rainfall may vary from one location to another. 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 a recharge are 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 the 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 run-off to surface waters, pollutants picked up by run-off 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.

Regulatory Framework

In 1986, the Federal Safe Drinking Water Act (PI 93-523) was amended to strengthen protection of public water system wellfields 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. The program calls for state and local governments to map these areas and develop protection plans, subject to EPA review and approval. Once a plan is approved, EPA may enter into an agreement with the local government to implement the plan. As of this writing, EPA has not completed development of the criteria needed to implement this program.

State

In implementing the Florida Safe Drinking Water Act (Ch. 403, F.S.), DER has developed rules classifying aquifers and rules are currently being amended to strengthen protection of sole source aquifers and wellfields tapping them. DER has also established regulatory requirements for facilities which discharge to groundwater (Section 17-4.245, F.A.C.) and which inject materials directly underground (Chapter 17-28, F.A.C.).

The task of identifying the nature and extent of groundwater resource available within the state has been delegated to the regional Water Management Districts. Each district must prepare and make available to local governments a Groundwater Basin Resource Availability Inventory (GWBRAI), 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 inventories, and legislative intent for their use, are found in Chapter 373, Florida Statues, which reads:

Each Water management district shall develop a ground water basin resource availability inventory covering those areas deemed appropriate by the governing board. This inventory shall include, but not be limited to, the following:
(1) A hydrologic study to define the ground water basin and its associated recharge areas.
(2) Site specific areas in the basin deemed prone to contamination or overdraft resulting from current or projected development.
(3) Prime ground water recharge areas.
(4) Criteria to establish minimum seasonal surface and ground water levels.
(5) Areas suitable for future water resource development within the ground water basin.
(6) Existing sources of wastewater discharge suitable for reuse as well as the feasibility of integrating coastal wellfields.
(7) Potential quantities of water available for consumptive uses.

Upon completion, a copy of the ground water basin availability inventory shall be submitted to each affected municipality, county and regional planning agency. This inventory shall be reviewed by the affected municipalities, counties, and regional planning agencies for consistency with the local government comprehensive plan and shall be considered in future revisions of such plan. It is the intent of the Legislature that future growth and development planning reflect the limitations of the available ground water 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 Floridan 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.). As of this writing the GWBRAI for Franklin County has not been completed.

Local

At the present time the City of Apalachicola has no special regulatory programs related to protection of natural groundwater aquifer recharge area.

2. EXISTING CONDITIONS

Natural Groundwater Aquifer Recharge Areas

The groundwater system underlying Franklin County generally consists of two aquifers: (1) the surficial or water table aquifers; and (2) the subsurface Floridan aquifer; The Floridan is more than 2,000 feet deep in Franklin County (see Figure E-l) . Because of highly mineralized water present at the base of the unit, however, the productive portion of the aquifer is less than 5tDO feet thick. No recharge to the Floridan Aquifer occurs in Apalachicola, according to the water resources atlas, published by the State of Florida in 1984. The water table aquifer lies just below the land surface and extends throughout the county. It is open to infiltration from rainfall in varying degrees, depending on the percolation characteristics of surface soils and extent of impervious surfaces which have been created in the City.

Recharge to the Floridan Aquifer and other confined aquifers does not occur everywhere but is restricted to places where the altitude of the water table is higher than the altitude of the potentiometric surface of the confined aquifers. Natural recharge to the Floridan Aquifer is divided into four classes.

Areas of generally no recharge under natural conditions occur mostly where the potentiometric surface of the aquifer is above the land surface much of the time, that is, in areas of artesian flow. About 45 percent of the state falls with this classification. Areas of very low recharge occur where the Floridan is overlain by relatively impermeable confining beds that are generally more than 25 feet thick. In these areas recharge rates are estimated to be less than 2 inches per year. Areas of very low to moderate recharge (estimated to range between 2 inches and 10 inches per year) occur where the confining beds are generally less than 25 feet thick or are breached. Where the confining bed is breached or absent, but where the water table and the potentiometric surface, of the Floridan Aquifer are both close to the land surface, little recharge occurs (see Figure E-2).

The Floridan is overlain by sediments that restrict effective recharge. Water in the Floridan Aquifer eventually moves down gradient to discharge areas in the Gulf of Mexico. The Apalachicola River has its drainage basin outside of Florida. Eight percent of its basin is in Alabama and Georgia. Groundwater recharge from outside Florida is limited to the Floridan aquifer and occurs only in those areas where the aquifer outcrops or is very near the surface. These offshore outcrops occur near the coast in Franklin County.

Groundwater in the Apalachicola area is abundant and of good quality. The groundwater system underlying the City of Apalachicola consists of the Floridan Aquifer and a surficial aquifer. Groundwater discharges into streams, wetlands, and coastal waters. Groundwater in the area moves in a southwesterly direction.

Two of the principal problems in the Northwest Florida Water Management District is potential wellfield depletion and saltwater intrusion along coastal areas. Although excessive groundwater pumping is a problem in some northwestern counties in Florida; it is not a problem in Franklin County. The Fresh Groundwater withdrawals chart of the Water Resources Atlas of Florida, 1984, indicates that less than one million gallons per day are withdrawn. Since there is minimal development and impervious surfaces, there is a fair amount of recharge to the groundwater system through evapotranspiration. There are no underground injection wells in Franklin County. The atlas also indicates that Apalachicola has little to slight tolerance for development due to the close proximity to saltwater.

3. NEEDS ASSESSMENT

Summary and Recommendations

At the present time, insufficient information is available to allow the City to institute a site-specific comprehensive aquifer recharge area protection program. This problem should be remedied with completion of the GWBRAI for Franklin County by the Water Management District. Until the GWBRAI becomes available, the City of Apalachicola should adopt interim measures to promote protection of aquifer recharge functions based on known characteristic of development within the county and general knowledge of aquifer recharge principles.

The pattern of development within the City is expected to remain relatively stable during the next few years, supported by water and sewer facilities. The city stormwater drainage regulations should emphasize the preservation of natural drainage features and the use for drainage retention structures to maximize ground water recharge. For all new development, the City should incorporate provisions in its land development code requiring conservation of areas with the greater recharge potential, based on the soil survey for the county.

Emphasis should be placed on identifying, mapping and managing areas with the greatest recharge potential. This should be done in cooperation with the Water Management District and the Soil and Water Conservation District. The City should cooperate with the Water Management District in any regional program to protect recharge areas affecting City water supply. The City has drafted a letter to the Northwest Florida Water Management District requesting status of the GWBRAI.

GOALS, POLICIES, AND OBJECTIVES

GOAL 1: NEEDED PUBLIC FACILITIES SHALL BE PROVIDED IN A MANNER WHICH PROTECTS INVESTMENTS IN EXISTING FACILITIES AND PROMOTES ORDERLY, COMPACT URBAN GROWTH.

Objective 1. Through the projected planning period 2020, local ordinances will continue to require that adequate facility capacity is available at the time a development order is issued, or will be available at the time impacts from the development occur.

Policy 1.1:

FACILITY/SERVICE AREALEVEL OF SERVICE STANDARD

Facility/Service Area	Level of Service Standard
Sanitary Sewer Facilities	Average Sewage Generation Rate 400 gallons per customer per day
Solid Waste Facilities	Average Solid Waste Generation Rate - 5 pounds per capita per day
Drainage Facilities	Design Storm Retains first 1. 5 inch of run off - 25-year frequency, 24-hour duration; Rainfall Intensity curve-zone 1, DOT Drainage Manual, 1979
Potable Water Facilities	Average Water Consumption Rate 3OO gallons per customer per day

Policy 1.1.1: All improvements for replacement, expansion or increase in capacity of facilities shall be compatible with the adopted level of service standards for the facilities.

Policy 1.1.2 The Public Works and Planning Departments shall jointly develop procedures to update facility demand and capacity information as development order or permits are issued.

Policy 1.1.3:
The Planning Department will coordinate with all local governments within the designated service areas to ensure that their comprehensive plans and development permit procedures are compatible with City policy.

Policy 1.1.4:

The City shall design and implement a water conservation program and educate residents to the need for conservation.

OBJECTIVE 1.2: The City will maintain a five-year schedule of capital improvement needs for public facilities, to be updated annually in conformance with the review process for the Capital Improvement Element of this plan.

Policy 1.2.1: A Capital Improvement Coordinating Committee is hereby created, composed of the Directors of the Public Works, Planning Department and the City Manager, for the purpose of evaluating and ranking capital improvement projects proposed for inclusion in the five-year schedule of capital improvement needs.

GOAL 2: APALACHICOLA WILL PROVIDE SANITARY SEWER, SOLID WASTE, DRAINAGE AND POTABLE WATER FACILITIES AND SERVICE TO MEET EXISTING AND PROJECTED DEMANDS IDENTIFIED IN THIS PLAN.

Objective 2. 1: Existing deficiencies will be corrected by completing the following projects by 2020:
a) Develop and implement a street by street inspection program to detect and correct inflow Sand infiltration in the sewer system.
b) Determine whether or not the existing storm drains are tied to the sewer system. Apply for funding to correct stormwater pipes outfalling into the Apalachicola Bay.
c) While no increase in capacity to the sanitary
sewer facility will be needed, sewer connections will be increased to the maximum extent possible and plans developed to provide service to those areas which currently have septic tank systems.
d) Through education programs, reduce the per capita production of solid waste.
e) Develop and Implement a program to install
backflow valves in significant sections of the water system.
f) Improve the quality of the potable water supply is hardness and other objectionable factors.

Policy 2.1. : The City will implement recommendations of NOAA grant on Stormwater Management.

Policy 2.1.1: Reduce the amount of stormwater outfalling to bay and river and ponding along streets

Policy 2.1.2: No permits shall be issued for new development . which would result in an increase in demand on deficient facilities prior to completion of improvements needed to bring the facility up to standard.

Policy 2.1.3: The Planning Departments will continue to implement regulations specifying limitations on encroachment, alteration and compatible use of design storm event floodplains.

Policy 2.1.4: All required Federal and State permits shall be obtained before the County undertakes or authorizes construction or operation of facilities.

Policy 2.1.5: The water department is consideration with the planning office will institute steps to determine possible means to Improve potable water quality and start action to acquire funding to accomplish economical viable actions.

Policy 2. 1. 6: As a part of the city's sanitary sewer capital improvement plan provisions will be made for extension of sewer service to areas with septic tanks.

Policy 2.1.7: The water department and the city clerk's office will jointly provide water customers with information as to ways and means of conserving usage of potable water. This will be accomplished through inserts with the water bills, making spot announcements, newspaper public service releases, etc.

GOAL 3: ADEQUATE STORMWATER DRAINAGE WILL BE PROVIDED TO AFFORD REASONABLE PROTECTION FROM FLOODING AND TO PREVENT DEGRADATION OF QUALITY OF RECEIVING WATERS.

Objective 3.1: By 2020 the City shall implement a stormwater management plan and adopt a manual of practices to protect the Apalachicola Bay from stormwater pollution. The plan and manual shall be incorporate into the land development code and shall be compatible with the County's stormwater plan. In the interium the current stormwater management plan requirement of the land development code will be used-and modified as indicated.

Policy 3. 1. 1: The stormwater management plan will require new development to manage run-off from the 25-year frequency, 24-hour duration design storm event on-site so that post development run-off rates, volumes and pollutant loads do not exceed predevelopment conditions. The plan will also require, during development, the use of erosion and sediment controls as described in the manual.

Policy 3. 1. 2; The stormwater management plan shall limit the area of impervious surfaces used in all new development.

Policy 3. 1. 3: The stormwater management plan will prohibit the use of herbicides in Critical Shoreline District.

Policy 3.i.4: The road department will inspect City drainage systems on an annual basis and made recommendations to the City Commission regarding improvements necessary for the efficiency of the system and safety of residents. The City shall use its annual road department inspection of drainage facilities along with the completed stormwater plan as the basis for the prioritizing funding for drainage improvements.

Policy 3. 1. 5: All projects required to meet projected demands for the year 1996 through 2000 shall be submitted to the Capital Improvements Coordinating Committee and scheduled in the Capital Improvements Element of this plan in accordance with the requirements of Section 163.3177(3) F.S.

Objective 3. 2: The City shall protect the quality of water on the Apalachicola River and Bay to the extent that all waters maintain existing classifications for water quality as established by the Florida Department of Environmental Regulation. In the interium the current stormwater management plan requirement of the land development code will be used and modified as indicated.

Policy 3.2. 1: Through the 2020 planning period the City shall-continue to enforce its comprehensive stormwater management ordinance which provides for: (1) buffer zones between the Apalachicola Bay/River and upland development so that stormwater discharge is diverted away from surface waters; (2) to the greatest extent possible the use of natural systems to provide filtration of stormwater run-off

Policy 3.2.2: Through the 2020 planning period, all waterfront properties will be serviced by an adequate central sewer system.

Objective 3. 3; Through the year 2OOO, the City shall, through its land development regulations prohibit development which would result in the water quality of Apalachicola Bay, River and aquifers being degraded below the current classification of "good". 9J5.013(2)(b)(2)

Policy 3.3.1: No new point source shall be permitted to discharge into Apalachicola Bay, River, St. Vincent Sound or into ditches or canals that flow into the above named waterbodies.

GOAL4: ELIMINATE UNMANAGED HAZARDOUS WASTE

Objective 4. 1: By 2020, decrease the amount of unmanaged hazardous waste sites by fifty percent.

Policy 4.1.1: All large quantity generators of hazardous wastes and materials should be required to properly manage their own wastes and materials: including keeping accurate records, proper handling and disposal, scheduled on site inspections by proper authorities and individual regular monitoring of activities involving such matters.

Policy 4.1.2: The Public works Department will develop and implement a hazardous waste management program to ensure that collection, storage and transfer operations comply with the provision of Section 403.7265, F.S.

Policy 4.1.3: Design, siting and construction of the hazardous waste transfer/temporary storage facility will be based on the results of the most recent update of the hazardous waste management assessment conducted by the Apalachee Regional Planning Council, and will be compatible with the regional and state hazardous waste management program.

GOAL 5: FRANKLIN COUNTY WILL PROVIDE SOLID WASTE SERVICES TO MEET EXISTING AND PROJECTED DEMANDS IDENTIFIED IN THIS PLAN

Objective 5. 1 Projected demands through the year 2O20 will be met by maintaining the recently opened County landfill in accordance with FDER permit requirements.

Policy 5.1.1:

No permit shall be issued by the City for new development which would result in an increase in demand on a deficient facility prior to completion of improvements to bring the facility up to standard.

Policy 5.1.2: An annual summary of facility capacity and demand, prepared by the County Planner shall be used to evaluate the need for Increasing the capacity of existing facilities. The city planning department will cooperate with the county in this evaluation.

Policy 5. 1. 3: The City shall cooperate with the County in providing educational programs which will result in increased recycling and decreased per capita production of solid waste

GOAL 6: UTILIZE EXISTING CAPACITY OF WASTEWATER TREATMENT PLANT

Objective 6. 1: Increase the number of sewer hook-ups from 1, 026 subscribers to 1, 100 by 1995.

Policy 6.1.1: Continue to implement regulations which require all moderate and large scale developments to provide wastewater treatment either through expansion of existing facilities or through package treatment plants.

Policy 6.1.2: Use the maximum operational capacity of existing public facilities before new facilities are constructed.

GOAL 7: PUBLIC FACILITY PLANNING SHALL BE AN INTEGRAL PART OF LOCAL PLANNING AND GROWTH MANAGEMENT IN THE REGION.

Objective 7.1: Increase the number of interlocal agreements between the City of Apalachicola, Carrabelle, the County and other utility districts by 257. percent by the year 20OO.

Policy 7.1.1: The City shall:
a). Discourage unplanned growth.
b). Identify land for future infrastructure
needs and protect or acquire such land in advance.
c). Provide water and sewer services when
capacity is available to subscribers outside the City limits.
d). To coordinate with other jurisdictions to ensure that existing unused or under used public facilities are utilized to the maximum extent possible.

Policy 7.1.2: The location of facilities shall be used to guide urban development and to assist in the implementation of approved local and regional plans

Policy 7.1.3: Businesses, institutions, agencies, and governments within the region should cooperate to exchange ideas and information on the funding and operation of public facilities

Policy 7.1.4: New development that creates a demand for additional public facilities shall be responsible for financing their fair share of the cost of the facilities.

Objective 7. 2; The City shall, through its land use regulations, protect and conserve soil resources by controlling the encroachment of urbanization on land poorly suited for structural development.

Policy 7.2.1: The City's site plan review process shall be amended to take into consideration natural constraints such as flood hazard, wetlands, soil suitability and aquifer recharge potential, and shall be restricted depending upon the severity of those constraints.

GOAL 8: THE FUNCTION OF NATURAL GROUNDWATER AQUIFER RECHARGE AREAS WITHIN THE CITY WILL BE PROTECTED AND MAINTAINED.

Objective 8.1: By 2020, the City will request assistance from the Northwest Florida Water Management District to identify and map prime natural groundwater aquifer recharge areas.

Policy 8.1.1: Areas identified by the Northwest Florida Water Management District with the greatest recharge potential and which are undeveloped shall be classified as prime recharge areas and designated as conservation areas on the County's Future Land Use map.

Objective 8. 2: By 2020, the City land development code will provide for maintenance of aquifer recharge areas functions.

Policy 8.2.1: The subdivision regulations shall be amended to include standards for inclusion of recharge areas in open space preservation requirements

Policy 8.2.2: The City will coordinate with local, state and federal agencies to achieve regional aquifer recharge protection zoning objectives.