



Flagler County Comprehensive Plan 2010-2035
Flagler County, Florida

Infrastructure Element
Data and Analysis



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Appendix

Flagler County Water Supply Facilities Work Plan

I. Introduction

This chapter provides data and analysis related to the management, protection and provision of sanitary sewer, potable water, solid waste, stormwater drainage systems and aquifer recharge protection. The information contained in this chapter serves as the basis for the Plan's infrastructure related goals objectives and policies. The planning horizon for this element is for the 25-year period between 2010 and 2035.

Following the introductory sections below, this chapter is divided into five sub-chapters, one for each environmental service. Each subchapter contains: (1) a discussion of the regulatory framework governing each environmental service, 2) a description of existing conditions, (3) an analysis section, and 4) conclusions and recommendations.

II. Geographic Setting

Flagler County is located on the northeast coast of Florida, and comprises approximately 504 square miles or 318,977 acres. The county is bounded on the north and south by St. Johns and Volusia counties, respectively. The Atlantic Ocean is the eastern boundary, and Putnam County is the western limits. The 15,960-acre Crescent Lake makes up a large portion of the shared boundary with Putnam County.

Flagler County lies within the Atlantic coastal plain region. Its topography consists of a series of marine terraces that formed at times when the sea alternately inundated and receded from the Florida peninsula. The resulting landscape that formed is fairly flat. The Silver Bluff terrace ranges in elevation from 0 to 10 feet as per the National Geodetic Vertical Datum (NGVD) above sea level and is primarily located along the east coast from the ocean to about three miles inland. The Pamlico Terrace, 10 to 25 feet NGVD, occurs in a wide portion of western Flagler County and as a narrow band between the Silver Bluff and Talbot terraces in the east. The Talbot Terrace, 25 feet NGVD and up, is the highest landmass in Flagler County. The topographic high along this terrace is commonly known as the Atlantic coastal ridge, which divides the county into two major drainage basins; the upper East Coast basin and the lower St. Johns River basin. Because of the relatively level terrain, much of Flagler County is poorly drained with many swamps and marshlands.

The climate of Flagler County is humid subtropical with an average annual temperature of 70 degrees Fahrenheit. The average annual rainfall is about 50 inches, most of which occurs during the summer and early fall.

The Intracoastal Waterway, a navigation route maintained by the U.S. Army Corps of Engineers, is located along Flagler County's East Coast. It connects portions of the Matanzas River on the northern boundary of the county, and the Halifax River below the southern boundary. It is sheltered from the Atlantic Ocean by a barrier island composed of mangrove stands and saltwater marshes that rise up to the coastal strand and sand dunes. The barrier island varies in width from about 1/5 to 1 mile, and the top elevation of the dune ridge is typically 10 to 15 feet NGVD. Much development has occurred in areas east of the Intracoastal Waterway along the Atlantic coast.

The major road network of Flagler County consists of Interstate 95, U.S. Highway 1, S.R. A1A and several other state and county roads. S.R. A1A runs along the coast from Volusia County to St. Johns County providing access to both beaches and sites along the Intracoastal Waterway. I-95 and U.S. Highway 1, further west, both roughly parallel the coastline on the mainland allowing access to the northeast and southeast regions. The main east-west highway is S.R. 100, which runs from S.R. A1A to Putnam County north of Crescent Lake.

III. Population Density & Spatial Distribution

There are five incorporated areas in Flagler County: the cities of Beverly Beach, Bunnell, Flagler Beach, Marineland and Palm Coast. Bunnell is the county seat and is located at the intersection of U.S. Highway 1 and State Road 100. The City of Flagler Beach is located between the Atlantic Ocean and the Intracoastal Waterway stretching roughly six miles north from the Volusia County border. The Towns of Beverly Beach and Marineland are immediately north of the city of Flagler Beach and can be characterized as small coastal “beach towns”.. Beverly Beach is located adjacent to the City of Flagler Beach, and Marineland is situated at the northeast corner of the county. There is also a marine life tourist attraction at Marineland. There is a quasi-governmental organization known as the Dunes Community Development District (CDD). The District was created in 1985 to finance and manage major infrastructure facilities and services associated with the development in the District service area. At present, the District is responsible for potable water and wastewater utilities, distribution of reclaimed water for irrigation, storm water management for the community, operations financing and maintenance of the Hammock Dunes Toll Bridge. The District service area is approximately 2,200 acres and is located within the unincorporated land of Flagler County. The District serves the private communities of Hammock Dunes, Ocean Hammock, Hammock Beach, and Yacht Harbor Village.

The following table summarizes the current area and 2007 population.

Table D-1. Population Estimates 2007		
	Area (acres) 2009	April 1, 2007 (est.)
Flagler County Total	310,400	93,568
Beverly Beach	195	509
Bunnell	87,939	2,394
Flagler Beach	2,531	5,401
Marineland (part)	124	9
Palm Coast	57,987	70,376
UNINCORPORATED	161,624	14,879

Source: Bureau of Economic and Business Research, 2008; Flagler County Planning and Zoning Department (NEFRC GIS data).

Flagler County can be divided into two major geographic areas: the coastal area east of U.S. Highway.1 and western Flagler County west of U.S. Highway 1 (See Map 2, Major Geographic Regions).The coastal area east of U.S. Highway 1 occupies approximately thirty-five percent of the total land area. This area contains the coastal cities of Flagler

Beach, Beverly Beach, Marineland and Palm Coast. There are five areas of unincorporated Flagler County that include the planned communities of Plantation Bay, Matanzas Shores, Grand Haven, Hammock Dunes, as well as the unincorporated Painters Hill and Hammock areas along A1A. Most of the urban development activity in Flagler County has occurred in this area due to following factors:

1. Traditional development pattern of the Florida Atlantic coast.
2. The attractive natural resources.
3. A relatively affordable supply of housing within a reasonable commute of employment opportunities in other counties.
4. A developed and connected roadway system providing access to SR A1A, Interstate 95, U.S.1 and SR 100.

Current land development patterns show that most of the residential development in the coastal area is occurring in the City of Palm Coast and surrounding unincorporated areas where central water and sewer facilities are available. Other residential development occurs in the incorporated areas of Flagler Beach, Beverly Beach or Bunnell, and older, small subdivisions or isolated single-family residences along A1A, SR 100, Old Dixie Highway, Old Kings Road and John Anderson Highway

The eastern, coastal region of the county also has many regional inducements for continued growth. The eastern seaboard of Florida has traditionally experienced growth because of tourism/retirement and proximity to the ocean and Intracoastal Waterway. Flagler County has traditionally been a tourism and retirement destination. Given the changes in the global economy, Flagler County now has additional attributes (proximity to Interstate I-95, FEC rail line, close proximity to Jacksonville and Orlando Metropolitan Statistical Areas) that could be alluring for development of industrial and technological uses.

The region of Flagler County west of U.S.1 occupies approximately 65 percent of the total land area. This area is characterized by farming and timber production. Small rural communities that have existed for many years include St. Johns Park, Espanola, Haw Creek and Cody's Corner. Rural subdivisions (one acre minimum) include Flagler Estates, Daytona North and Smokerise. Daytona North is an old residential subdivision with no existing infrastructure and few paved roads. Flagler County has adopted a municipal services taxing district to fund improvements to roadways and drainage facilities. The residents in Daytona North rely on septic tanks and on-site wells for sewer and water services. Flagler Estates is an area that has been divided through a process that allowed the land to be used and sold for agricultural purposes. The Flagler Estates area is not vested since it is not a valid subdivision approved by Flagler County and Flagler County has no legal obligations to provide services.

Up until 2005 there was little development pressure seen in the West Flagler region. In 2005, the annexation of 10,000 acres into the City of Bunnell raised concerns from state and regional agencies. The Florida Department of Community Affairs, the Northeast Florida Regional Council and other reviewing agencies expressed a concern that the annexation would spur the unchecked development of the sparsely populated rural

lands. The primary issue pertains to the potential for sprawling development occurring in a manner that:

1. Does not address the provision of urban services in an efficient and orderly manner;
2. Results in the degradation of valuable natural resources including wetlands, wildlife corridors and aquifer recharge areas;
3. Establishes incompatible land use patterns that effectively eliminate the existing agricultural uses and rural land uses.

IV. Sanitary Sewer Sub-Element

Flagler County is still primarily a rural county, even with the recent annexation and explosive growth of the 1990's and early 2000's. The primary source of wastewater in Flagler County is residential dwelling units, but there are non-residential generators of wastewater as well. The majority of the non-residential generators are commercial and office uses that are located along major roadways, such as SR A1A, US 1, SR 100 and I-95. There are limited industrial uses along US 1 and at the County Airport. These uses generally do not require specialized treatment since there is not any discharge of hazardous material in the sewer system.

The primary treatment of the residential developments in the west of US 1 and in the rural areas along the Intracoastal Waterway is the on-site septic tank. Flagler County does not provide centralized sanitary sewer to any residents of unincorporated Flagler County, but does operate a plant that serves the City of Beverly Beach. There is the Dunes CDD that provides centralized sanitary sewer services to a majority of unincorporated areas on the barrier island. There is a private utility that provides these services to the Plantation Bay Development of Regional Impact (DRI).

A. Treatment Technology

The following provides a summary of the process for the treatment of wastewater. Centralized sanitary sewer facilities are comprised of three components, which perform the basic functions of sewage collection, treatment and disposal.

The collection system is typically composed of a network of gravity sewer pipes and manholes which collect sewage (wastewater) from individual establishments and convey it to pump stations which transport the flows to a central location for treatment. In Palm Coast, a relatively new technique is being used in part of its collection network called a pretreatment effluent pumping system. This method uses low pressure instead of gravity flow to transport sewage to a pump station. Collection networks are generally laid in a branching pattern.

The sewage collected is predominantly from domestic uses such as homes, retail shopping centers and restaurants. Some establishments, however, may generate concentrations of chemical compounds, which are incompatible with domestic wastewater treatment systems. These establishments are typically in the industrial or manufacturing fields and are classified as "point sources" of pollution. The wastewater from these establishments is often pretreated on site to eliminate or reduce the pollutants prior to discharge into the central sewer system.

The major components of the sewerage collection and conveyance network are the interceptors, trunk mains, sewer mains, force mains and pump stations. Interceptors are gravity sewers that connect directly to and convey sewage to the treatment plant. Trunk mains are gravity sewers that connect directly to and convey sewage to an interceptor or master pump station. Sewer mains are gravity sewers that convey sewage to a trunk main or pump station. Force mains are pressure pipes used to convey sewage from a remote location to a master pump station, interceptor, trunk main

or sewage treatment facility. Pump stations are also used to transport sewage from a remote location to a master pump station, trunk main, interceptor or to the wastewater treatment facility. Pumping systems are used where the terrain is relatively flat, the water table is high, or where distances are extensive.

Wastewater treatment plants (WWTP) function to remove solids, organic materials, and other constituents from the sewage depending upon the type or method of treatment. The processes that are used can generally be grouped into one of the following three categories depending on the constituents removed:

Primary Treatment, which removes approximately 30 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.

Secondary Treatment: Which removes between 80 and 90 percent of the total organic materials and suspended solids from sewage. This level of treatment generally requires multiple steps involving primary treatment, biological reaction processes and secondary settling.

Tertiary Treatment: Which removes organic or inorganic compounds that are not removed by primary or secondary treatment and may otherwise cause adverse environmental impacts to the receiving water body. The most common tertiary processes remove nutrients such as phosphates, nitrates and suspended solids. The effluent of advanced wastewater treatment (AWT) processes often approaches potable water purity and clarity.

Effluent is the treated wastewater that flows out of the wastewater treatment facility. The effluent must meet regulatory standards. Effluent disposal systems include discharge into a surface water body, wetlands, spray irrigation, percolation, or deep well injection.

Sludge is the end product of the wastewater treatment process, and refers to the accumulated solid residues from the treatment processes. Sludge is biologically stabilized and dewatered prior to final disposal. Sludge may be disposed by either burial in landfills or land applications as a soil conditioner.

Package treatment plants are small treatment systems generally with capacities less than 1 (one) million gallons per day (MGD) which have a collection and conveyance network and a disposal system. Package plants providing secondary treatment are most commonly used. They are generally used to serve isolated developments and are usually preassembled prior to shipment. Disposal of sludge from package treatment plants is sent to either public landfills or regional wastewater treatment plants.

Septic tank systems are used to serve commercial and residential units where off-site sewage treatment facilities are not available and where soils are suitable. The system

consists of the septic tank and the drainfield. The tank receives wastewater and provides a period of settling, during which time the suspended solids settle to the tank's bottom. Bacteria in the tank gradually decompose the settled solids. The liquids are discharged into the drainfield. The drainfield disperses the septage (effluent) over a wide ground area where it percolates into the soil and microorganisms and filtration processes purify the liquids. Septic tanks require emptying every three to five years to remove accumulated solids. The solids are generally transported to regional sanitary sewer facilities for treatment prior to disposal.

B. Coordination with Related Plans

State Comprehensive Plan

The State Comprehensive Plan requires regional comprehensive policy plans and local comprehensive plans to reflect the goals and policies of the State Plan. Also, it is the intent of the Florida Legislature that the State Comprehensive Plan be construed and applied as a whole and that its goals and policies be reasonably applied where they are economically and environmentally feasible, not contrary to the public interest and consistent with the protection of private property rights.

The State's policies relating to sanitary sewerage facilities include the following:

- 1) Eliminate the discharge of inadequately treated wastewater into waters of the State.
- 2) Promote the development of innovative methods of wastewater treatment.
- 3) Promote the disposal and reuse of wastewater effluent using methods that will reduce the degradation of water resources.
- 4) Encourage the research, development and implementation of recycling, resource recovery, energy recovery and other methods of using sewage, sludge and other wastes.
- 5) Identify, develop, and encourage environmentally sound wastewater treatment and disposal methods.
- 6) Promote methods that encourage efficient urban development so that areas with the capability and capacity to accommodate new growth are utilized.
- 7) Provide incentives for developing land that maximize the use of existing public facilities, and promote the rehabilitation and reuse of these existing facilities and buildings as an alternative to new construction.
- 8) Encourage the development of gray water systems to extend existing sewerage capacities.

Northeast Florida Strategic Regional Policy Plan

The Northeast Florida Regional Council (NEFRC) has adopted water resource policies in its Strategic Regional Policy Plan addressing the protection of potable water supplies, natural systems, and coastal and marine resources. Additionally, the plan contains policies pertaining to hazardous and non-hazardous materials and waste, including wastewater treatment and disposal. The NEFRPC has also adopted policies concerning public facilities, governmental efficiency and plan implementation. The Planning Council's Strategic Regional Policy Plan serves to:

- a) Discourage the practice of underground injection of wastewater.
- b) Discourage the use of package wastewater treatment plants and/or septic tanks where regional or local alternatives are available.
- c) Provide for compliance with applicable state regulations and permit conditions by municipal and private central sewerage systems within a specified time frame.
- d) Encourage the land application of treated wastewater effluent where appropriate.
- e) Promote the reuse of treated wastewater where financially, environmentally and socially practicable in accordance with the rules and policies of the St. Johns River Water Management District.
- f) Severely limit and regulate septic tanks within 100-year flood plains.
- g) Reduce wastewater discharges in marine estuaries by encouraging wastewater reuse.
- h) Prohibit the discharge of wastewater into Class II waters and Outstanding Florida Waters.
- i) Promote and implement by environmentally sound, alternative methods of wastewater treatment and disposal.
- j) Encourage the reuse of treated effluent for purposes such as the irrigation of golf courses, parks, cemeteries, and green spaces by municipal and private wastewater facilities in areas where no harm to ground and surface waters will occur.

Municipalities Comprehensive Plans

Flagler County faces several coordination issues at the local level. The first is as a supplier of services to the City of Beverly Beach. The utilities system serving this small coastal city were originally owned and operated by a private provider. The County assumed ownership and maintenance responsibilities. Flagler County and Beverly Beach must implement a formalized concurrency management system to ensure that the existing and future development can be properly served. The two governments also

must coordinate capital expenditure and capacities of the plants to ensure that the residential population residing in the Coastal High Hazard Area (CHHA) is not increased. The coordination between the two governments in the implementation of the the City of Beverly Beach concurrency system is expected to address the provision of utilities through the 25-year planning horizon.

The second issue pertains to provision of centralized utilities to residents of incorporated Flagler County. The County has not approved any plans for the development and construction of a new sanitary sewer utility owned and maintained by Flagler County. This is expected to be the policy direction for the 25-year planning horizon. Development projects proposed in unincorporated Flagler County that require provision of centralized utilities cannot occur unless there are private or public providers that have the capabilities of serving the development. This policy direction requires that the County act as coordinator and regulator, rather than a utility provider. The County must be aware of restrictions and limitations established in the comprehensive plans for local governments to ensure that land development is consistent with the adopted levels of service.

C. Regulatory Framework

The federal level is covered by the Water Pollution Control Act that controls “point sources” of pollution, such as WWTPs. The goal of the Act is the restoration and/or maintenance of the chemical, physical and biological integrity of the nation’s water resources. The Act established national policy for implementation and management of wastewater treatment facilities to comply with the desired water quality standards. The U.S. Environmental Protection Agency (EPA) is responsible for the implementation of the Act.

The U.S. Environmental Protection Agency delegated its responsibilities to the Florida Department of Environmental Protection (DEP). DEP has adopted rules for regulation of wastewater treatment facilities. Chapter 62-600, FAC promulgates the rules that apply to the following wastewater treatment facilities.

- a) Any domestic wastewater treatment facility of a design capacity in excess of 2,000 gallons per day (gpd) which serves the complete wastewater treatment and disposal needs of a single establishment.
- b) Septic tank drainfield systems and other on-site sewage treatment systems with subsurface disposal of a design capacity in excess of 5,000 gpd which serves the complete wastewater treatment needs of a single establishment, with the exceptions of restaurant facilities with flows in excess of 3,000 gpd and industrial or commercial laundry facilities.

The Florida Department of Health regulates all other septic tank and drainfield installations within the state. These requirements have been adopted by rule in Chapter 10D-6, FAC.

The Development and Subdivision Regulations of Flagler County (Article IV, Land Development Code) specifies that sanitary sewage disposal systems are part of the required improvements for development, where applicable. There are standards that pertain to subdivisions with minimum lot sizes less than one acre, exclusive of road rights-of-way, that include a requirement that the subdivision be served by a centralized wastewater collection system for treatment and disposal. Subdivisions with minimum lot sizes greater than one acre, exclusive of road rights-of-way, may be permitted utilizing individual sewage disposal systems (septic tanks) depending upon drainage, water potability, environmental sensitivity and public considerations. Where septic tanks are allowed, they must be located in front yards to facilitate future connections to central systems. Also, in accordance with the regulations, all dwellings units in cluster developments must be connected to an approved central sanitary sewer system.

The Flagler County Board of County Commissioners does not provide residents with central sanitary sewer facilities. There are two central wastewater systems currently operating within the unincorporated area of Flagler County. The systems include Palm Coast, Dunes Community Development District and Plantation Bay. The Florida Department of Environmental Protection provides regulatory oversight for compliance with state wastewater regulations. The Plantation Bay wastewater treatment plant facility is under the ownership and responsibility of a private operator.

D. Current Conditions

The main areas served by central sewerage systems are located in the East Coast region of Flagler County. Most of these facilities provide tertiary and secondary treatment. Areas served by wastewater treatment facilities consist of five municipalities, and the CDD. There are service agreements with Volusia County and the City of Ormond Beach for residential developments immediately adjacent to the Flagler County southern boundary. There are ten small-scale treatment plants permitted by the Florida Department of Environmental Protection (FDEP). Four of the Five Flagler County municipalities provide centralized sanitary sewer services within their city limits.

Flagler County assumed ownership of the City of Beverly Beach system from a private utility and will continue to operate the system during the 2010 to 2035 planning horizon. The City of Bunnell operates a 600,000 gallons per day wastewater treatment plant utilizing tertiary treatment at a plant that was upgraded in 1991. Bunnell does not presently provide sanitary sewer service outside its jurisdictional limits in order to reserve capacity for future growth within the city.

The Florida Department of Environmental Protection lists several small permits for wastewater treatment in Flagler County. In general, these are privately owned facilities serving small single uses or developments, without individual accounts. Each facility must maintain operational and treatment standard as required by the Florida Department of Environmental Protection. Also, the graphic limits and number of connections for each facility limited by its operating permit. The following table lists the current package treatment plant permits.

TABLE D-2. Miscellaneous Small Wastewater Systems, Flagler County

Permittee	Permit Number	Capacity (mgd)
Bulow KOA	FLA0039759	0.0300
Holiday Travel Park	FLA011603	0.0600
Marineland	FLA11612	0.0600
Maritime Estates	FLA011593	0.0150
Maritime Estates II	FLA001604	0.0134
Palm Coast Industrial Dev.	FLA011595	0.0100
Palm Coast Lodge	FLA011592	0.0030
Picknickers Campground	FLA039519	0.0100
Singing Surf Campground	FLA011594	0.0100
Waterside Country Club	FLA011609	0.0001

Source: Florida Department of Environmental Protection,

Developed areas of the County that are not served by a community wastewater system or package treatment plant use individual septic tanks. These facilities are regulated by Chapter 10d-6, F.A.C. through the County health unit. The Florida Department of Environmental Protection regulates larger septic tanks serving non-residential uses.

Coastal areas within Flagler County that use septic tanks for wastewater disposal include the communities of Painter’s Hill, Jose Park, Marineland Acres, Johnson Beach, Artesia, Magnolia Manor, and Armand Beach East. These communities are collectively known as the Hammock area and are generally located along S.R. A1A north of Beverly Beach.

Most of the western unincorporated rural areas and settlements of Flagler County do not have centralized sanitary sewer systems. Wastewater is disposed of by individual septic tank systems. Because the western portion of the County is sparsely populated and rural in character, central wastewater services are neither presently available nor anticipated in the future. These older rural settlements include Cody’s Corner, Deenville, Espanola, Haw Creek, Korona, and St. John’s Park. Other rural subdivisions utilizing septic tanks are Bulow Woods, Daytona North, Flagler Estates, and Smokerise. All of these communities have average densities of one to five units per acre.

Certain soil types can limit the safe use of septic tanks. High concentrations of septic tank discharges in areas that do not percolate well, have high organic content or have high water tables, may contaminate the surficial aquifer and degrade the environment. A map showing the soil limitations on septic tank usage is shown in the attached map series. Most of these areas are in the rural communities and older subdivisions of the county.

E. Future Needs and Improvements

The Board of County Commissioners as part the EAR-process and the development of the 2010-2015 Strategic Plan determined that it was in the public interest to minimize efforts to create a new utility owned and operated by Flagler County. The

recommended policy direction is that Flagler County shall coordinate with adjoining governments, quasi-governmental entities (e.g. Community Development Districts) and private utility providers to ensure an efficient and effective method of providing potable water and sanitary sewer, with the understanding that Flagler County will be the provider of these utilities when the following factors are present:

- a) The proposed development is consistent with the Flagler County Comprehensive Plan and Land Development Regulations (LDRs).
- b) The provision of centralized utilities is necessary for public health, safety and welfare.
- c) The design, construction and final acceptance of public facilities shall be the financial obligation of the private entity requesting the County's participation.
- d) There are no other opportunities for other utility providers to serve the proposed development.

The policy direction is based on several issues that have occurred since the adoption of the 2000 Comprehensive Plan. The incorporation of the City of Palm Coast and subsequent annexations by Palm Coast and the city of Bunnell have bifurcated the County's jurisdiction. The remaining areas are predominantly rural. There is considerable difficulty to create a new utility that can efficiently and effectively serve the 10 areas under the County's jurisdiction. This means that services, if appropriate and needed, would be best served by the existing providers of sanitary sewer.

Future demand was estimated by applying the adopted level of service to the projected population and land use within each service area in order to estimate average flows for the planning period. The total functional population estimates were based upon those projections presented in the Future Land Use Element.

Table D-3. Population Change 2010 to 2035						
	2010	2015	2020	2025	2030	2035
Total County	95,700	114,700	137,400	159,500	180,600	200,300
Unincorporated Population	12,221	14,121	16,391	18,601	20,711	22,681
Sanitary Sewer (gpd)	1,344,310	1,553,310	1,803,010	2,046,110	2,278,210	2,494,910

The Future Land Use Element identifies the eastern portion of the county as the geographic area suitable for urban land uses and intensities. Generally, this area is east of U.S. Highway 1 and includes the planned urban service areas and low intensity urban areas. The eastern area has land use designation and existing development patterns with a density ranging from .2-10 dwelling units per acre. The areas west of US 1 are designated primarily for agricultural or conservation land uses so there are no projected demands for centralized sanitary sewer services. The low density nature of

the agricultural land use category means that the entire area would be served by on-site septic tanks.

Flagler County has initiated efforts to protect agricultural and rural resources west of US 1. The effort is a tiered approach that relies initially on strict performance standards to establish “green” developments. Part of the requirements includes connection to centralized sanitary sewer and potable water. The County has adopted strategic plans that indicated that these services will be provided by entities other than the County. There are no plans for the 2010 to 2035 for a County-owned system operating in the area west of US 1.

F. Conclusions and Recommendations

Flagler County’s private wastewater utilities are adequately managed as shown by the lack of violations of state water quality standards. State or county public service commissions also regulate the utilities. In addition, Plantation Bay and the Dunes Community District are Developments of Regional Impact (DRI’s). Such developments have additional reporting requirements to ensure that the operation and expansion of their wastewater treatment facilities conforms to their development permits. It has been a policy decision of Flagler County to not be a provider of community wastewater treatment services. This policy should be continued based on the fact that the private utilities adequately provide this service. Regarding capacity issues, Flagler County’s private wastewater facilities have adequate capacity to serve their respective service areas through the year 2035.

V. Potable Water Sub-Element

Flagler County has changed considerably since the adoption of the 2000 EAR-based amendments. The incorporation of Palm Coast and annexations by the cities of Palm Coast and Bunnell has changed the service populations and areas. Flagler County still maintains jurisdiction over 161,624 acres, but the vast majority of vacant land is designated for either “Agriculture & Timberlands” or “Conservation”. The Board of County Commissioners realized that development of a new water utility for service to the unincorporated population is not prudent at this time. The population projections for 2035 by the Bureau of Economic and Business Research show an estimated unincorporated population of 22, 681 persons. This population and land use pattern indicated that coordination with existing providers of potable water services is a logical and efficient way of addressing the issue. This is further realized given the critical issue regarding supply of raw water.

A. Treatment Technology

A potable water supply system normally consists of a water supply source, a treatment plant and storage and distribution network. Groundwater constitutes the supply source for most systems. The selection of a source for any potable water system must consider the yield and quality of available sources and the costs of developing each source. Water is usually treated prior to human consumption. Treatment removes impurities from the raw water in order to improve its quality for public health and/or aesthetic appearances. Water treatment processes usually include aeration and chlorination although there are several reverse osmosis plants operating in the county. Any treatment process adds to the cost of supplying water, but it also expands the range of raw water sources that can be utilized.

Once water has been treated, it is available for use and human consumption. The water is supplied to individual users in the community by way of storage reservoirs and a distribution network. Large distribution mains carry potable water to major demand areas and interconnect with a network of smaller lines which eventually supply individual establishments and residences.

Water is delivered under pressure within the distribution system in order to ensure adequate flow and pressure to meet demands. Demand fluctuates during each day. Peaks occur during the morning and evening hours corresponding to periods of highest residential usage. Localized hour demand peaks also occur when the system is utilized for fire fighting. In order to provide adequate quantities and pressure to meet peak use and fire flow demands, storage tanks are linked with the distribution system at strategic locations. During low demand period, 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 commonly used for this purpose. Elevated tanks (water towers) are the most economical. Many systems also include auxiliary pumps, which operate only during peak demand periods.

There are three sources of groundwater in Flagler County: the Floridan aquifer, the intermediate aquifer (a/k/a confined surficial), and the surficial aquifer. The Floridan

aquifer extends throughout much of the state and the southern part of Georgia and is the major source of water in Flagler County. The Floridan is an artesian aquifer. Artesian aquifers are the result of groundwater in a permeable geologic formation confined by an impermeable formation, or aquiclude, so that its surface is not free to rise and fall. The theoretical limit to which water from an artesian aquifer will rise in a tightly cased well is called its potentiometric level. The depth to the top of the Upper Floridan varies from 50 to 150 feet below mean sea level (msl) while its potentiometric level is typically about 15 feet.

The Upper Floridan is primarily contained in Eocene Age limestone. The lower portion of the Eocene Age limestone is known as the Avon Park Formation. It is the deepest formation penetrated by wells in Flagler County. Overlying the Avon Park deposits is a layer of Ocala Limestone. The primary aquiclude of the Floridan is the Middle Miocene Hawthorn Formation. It consists of sand, clay, and marl embedded with phosphate and phosphatic substances. The base of this formation consists of a thin layer of dolomitic limestone in northern Flagler County. The Ocala Limestone and the dolomitic limestone of the Miocene Age are the primary sources of water for Flagler County wells. Upper Floridan aquifer wells can yield from 50 to more than 100 gallons per minute.

Water from the Upper Floridan aquifer in all but southern Flagler County is highly mineralized in both chlorides and hardness. Chlorides are present as dissolved solids and are indicative of saltwater contamination. Saline water in the Floridan aquifer remains from a previous geologic era when sea levels were higher and where flushing from freshwater recharge is incomplete. Saltwater intrusion also occurs due to over pumping of the overlying, less dense, freshwater from the aquifer. Hardness is a measure of the concentration of cations, primarily calcium and magnesium, present in the water. Other primary dissolved solids present in the Upper Floridan are sulfate and iron. The sulfate is from remnant seawater or is dissolved out of other minerals typically found in carbonate rocks.

The intermediate aquifer is also an artesian consisting of interstratified lenses of permeable sand, shell and limestone within the Hawthorne Formation. These lenses are usually from under 1 to more than 10 feet thick. They are normally low yielding, from 5 to 50 gallons per minute, but valuable alternative sources of water in those areas where the Upper Floridan is of marginal or non-potable quality. Total dissolved solids in the form of chlorides, hardness, sulfate and iron, are also found in the intermediate artesian aquifer.

The surficial aquifer is contained in Pleistocene and Holocene Age sand and shell deposits overlaying the intermediate and Floridan aquifers. It occurs throughout all of Flagler County and ranges in thickness from less than 20 feet to more than 50 feet. The well yield from the surficial aquifer system varies from a low of 2 gallons per minute in western Flagler County to 10 to 50 gallons per minute in eastern and central Flagler. It is a minor although important source of domestic water supply, particularly in coastal areas where the deeper aquifers contain non-potable water. Water from this source

varies greatly in quality and may be easily polluted. The upward and lateral movement of saltwater and the infiltration of contaminated surface waters are two areas of concern.

B. Regulatory Framework

The Federal Safe Drinking Water Act provided national legislation establishing water quality standards of potable water for public use, and regulated the operation of water supply, treatment, and distribution facilities to help achieve the standards set in the national legislation. This act established primary and secondary water quality standards. These primary water quality standards established minimum measures of water quality to ensure the public health. The secondary standards covered aesthetic water quality, such as taste and appearance. Implementation of the Act is the responsibility of the U.S. Environmental Protection Agency (EPA).

The U.S. EPA has delegated its responsibilities for implementing and enforcing certain conditions of the Federal Safe Drinking Water Act to the Florida Department of Environmental Protection. Florida adopted rules in Chapter 17-22, F.A.C., regulating drinking water quality standards.

FDEP, has in turn, delegated some of these responsibilities to the regional level. For example, the St. Johns River Water Management District (SJRWMD) has permitting authority over public water supply wells. This permitting authority is conferred under Chapter 40 of the Florida Administrative Code. The water management district monitors wells and water systems to insure that quantitative and qualitative standards are met.

Public supply water use is defined as water supplied to homes and industry that serve 400 or more people or that withdraw more than 0.01 mgd from groundwater or surface water sources. All public supply in Flagler County is from groundwater sources. Rule 62-40.520, Florida Administrative Code, which implements Section 373.036(4) Florida Statutes, requires water management districts to prepare assessments of water needs and sources for the next 20 years, including areas where resource problems exist or are anticipated. The SJRWMD published the Water Supply Needs and Sources Assessment, and the District Water Management Plan was approved. These documents provide the core of the regulatory framework for potable water planning in Flagler County. A critical resource impact was identified, and resulted in the designation of a Water Use Caution Area in Flagler County, in the vicinity of the Palm Coast wellfields.

At the local level the Development and Subdivision Regulations of Flagler County, (Article IV), specifies that water systems are part of the required improvements for development. This requires subdivisions with minimum lot sizes less than 1 acre (excluding road rights-of-way) to be served by a complete water treatment/distribution system. Individual wells are permitted in subdivisions with minimum lot sizes of 1 acre or greater (excluding road right-of-way) depending on drainage, water potability, environmental sensitivity, and public health and safety concerns. However, all dwelling units in cluster developments had to be served by approved central water systems

A shortcoming in the current local regulations is the lack of controls for well siting after the permitted building or facility is in place. To address this issue, the Division of Environmental Health of the Flagler County Health Department is preparing an ordinance for adoption, which would establish a permitting procedure for residential wells. This ordinance is being written to provide guidance for well siting.

C. Coordination with Related Plans

State Comprehensive Plan

The policies concerning potable water in the State Comprehensive Plan's water resource, land use and public facilities clusters are as follows:

1. Ensure the safety and quality of drinking water supplies.
2. Protect aquifers from depletion and contamination.
3. Protect surface and groundwater quality.
4. Promote water conservation
5. Ensure that new development is compatible with locally and regionally available water supplies.
6. Encourage the development of reverse osmosis and other desalination technologies.
7. Develop a system of incentives and discouragements that promote the separation of urban and rural land uses while protecting water supplies.
8. Consider the impacts of land use upon water quality and quantity, and the availability of land, water and other natural resources.
9. Promote activities that encourage efficient development in areas with the available services and capacity to service the development.
10. Promote the rehabilitation and reuse of existing facilities over new construction.

Northeast Florida Comprehensive Regional Policy Plan

The Northeast Florida Regional Planning Council has adopted policies consistent with those of the State concerning potable water. The policies of its Comprehensive Regional Policy Plan are intended to protect the quality and quantity of potable water supplies, to provide potable water efficiently and economically, and to develop alternative sources of potable water.

Municipal Comprehensive Plans

Flagler County faces several coordination issues at the local level. The first is as a supplier of services to the City of Beverly Beach. The utilities system serving this small coastal city were originally owned and operated by a private provider. The County assumed ownership and maintenance responsibilities. Flagler County and Beverly Beach must implement a formalized concurrency management system to ensure that the existing and future development can be properly served. The two governments also must coordinate capital expenditure and capacities of the plants to ensure that the residential population residing in the Coastal High Hazard Area (CHHA) is not increased. There is a third governmental entity, the City of Palm Coast, The two governments have been successful in the planning and implementation provides the treated potable water for the Beverly Beach distribution system. The County and the

cities of Beverly Beach and Palm Coast must coordinate to ensure that the requirements of the City of Palm Water Supply Facilities Work Plan are implemented to ensure that there is adequate supply of treated water for the residents of Beverly Beach. This is going to be the daunting task given the reliance on dwindling groundwater resources. The planned process is that Flagler County will support the efforts of the city of Palm Coast to develop safe and sufficient alternative sources of raw water. The coordination between the three governments in the implementation of the Palm Coast Water Supply Facilities Work Plan and the City of Beverly Beach concurrency system is expected to address the provision of utilities through the 25-year planning horizon.

The second issue pertains to provision of centralized utilities to residents of incorporated Flagler County. The County has not approved any plans for the development and construction of a new potable water utility owned and maintained by Flagler County. This is expected to be the policy direction for the 25-year planning horizon. Development projects proposed in unincorporated Flagler County that require provision of centralized utilities cannot occur unless there are private or public providers that have the capabilities of serving the development. This policy direction requires that the County act as coordinator and regulator, rather than a utility provider. The County must be aware of restrictions and limitations established in the comprehensive plans for local governments to ensure that land development is consistent with the adopted levels of service and water supply facilities work plans. Existing Conditions

D. Current Conditions

Flagler County needs to ensure that all data be consistent with the data used by the SJRWMD so that a coordinated planning effort can be accomplished. The following table summarizes the total water demand for the year 2005, based on data from SJRWMD.

Source	Ground	Surface	Total
Public Supply	8.15	0	8.15
Public Supply/Domestic Self Supply	1.88	0	1.88
Commercial/Industrial/ Institutional Self Supply	.01	0	.0
Recreational (Golf Course)	.04	.24	.28
Agriculture Irrigation Self Supply	6.11	3.19	9.30
Total	16.19	3.43	19.62

Source: SJRWMD 2008 Draft Water Supply Assessment

According to the SJRWMD data, the Flagler County’s population in 2005 was 88,313 people who consumed a total of 10.03 MGD from either a public source or domestic self supply. This results in a per capita consumption of 116.6 gallons per day. Applied to the 2010 population of 95,700 there is an estimated demand of 11.2 MGD in 2010. The population of residents within the jurisdiction of Flagler County in 2010 is estimated to be 12,221 who would generate a demand of 1.43 MGD. The incorporated residents are served by either private utilities, other local governments or on-site wells since Flagler

County does not own a water treatment plant. The County does own a potable water distribution system for the City of Beverly Beach, but purchases treated water from the City of Palm Coast and provides the maintenance of the distribution system for the City of Beverly Beach. The City of Palm Coast water treatment system consists of three water treatment plants (WTPs): WTP No. 1 (PWS identification number 2180863-01) is a lime softening plant with a permitted design capacity of 6.0 million gallons per day (MGD); WTP No. 2 (PWS identification number 2180863-02) is classified as a membrane softening plant with a permitted design capacity of 6.384 MGD; and WTP No. 3 (2180863-03) is a low pressure reverse osmosis treatment plant with a permitted design capacity of 3.0 MGD.

The primary water providers within the County are:

1. City of Bunnell (municipal)- 0.34 MGD in 2005
2. City of Flagler Beach (municipal)- 0.64 MGD in 2005
3. Dunes Community Development District (special district)- 0.28 MGD in 2005
4. Plantation Bay Utilities (private, but regulated by the PSC)- 0.10 MGD in 2005
5. Manufactured Home Communities- 0.11 MGD in 2005
6. Volusia County Utilities- 0.15 MGD in 2005

E. Future Needs and Improvements

The capacities of each of Flagler County's water systems are adequate to serve existing demand. In general, the water systems provide water that has acceptable taste, quality and color characteristics. However, there is a problem regarding water quantity. The SJRWMD has designated Flagler County as a Priority Resource Caution Area. The designation is due primarily to the large amount of water being drawn from groundwater supplies. There are limited options to groundwater resources within Flagler County. The use of limited withdrawals from surface waters, such as the St. Johns River, is one option, but this is not expected to be a viable alternative. The City of Palm Coast in conjunction with the other local governments and SJRWMD is working on the Coquina Coast Desalinization Plant to use ocean water and heavily brackish groundwater for future needs. This is in the early planning stages and it not a viable option in the 2010 to 2015 timeframe, but may be on-line at the end of the 2015 to 2035 planning horizon.

The following table summarizes the population projections for all of Flagler County and the portion residing in the jurisdiction of Flagler County. The projections differ from those seen in the draft 2008 Water Supply Assessment from SJRWMD, which show a 2030 population of 293,074. The difference between the two projections is sizeable (92,774 people). In order to maintain consistency with the SJRWMD, the population projections from the draft Water Supply Assessment will be used for planning purposes. It is imperative that once the 2010 Census is completed and updated projections from BEBR have been approved that the projections be reconciled for better coordination.

Flagler County Comprehensive Plan 2010 to 2035

Table D-4. Population Projections 2010 to 2035						
	2010	2015	2020	2025	2030	2035
Total Flagler County	95,700	114,700	137,400	159,500	180,600	200,300
Unincorporated Flagler County	12,221	14,121	16,391	18,601	20,711	22,681

Source: Flagler County Growth Management and Bureau of Economic and Business Research, 2009

The BEBR projections provide a method of estimating the population residing in the jurisdiction of Flagler County in 2035. The unincorporated portion of the total County population is approximately 11.32%. This can be applied to the 293,074 persons projected by SJRWMD in order to estimate the population residing in unincorporated Flagler County in 2030. Based on these estimates, Flagler County's 2030 population will include 33,186 people living in the jurisdiction of the County. SJRWMD in the draft 2008 Water Supply Assessment includes the following water demand projections, assuming that average rainfall is realized:

Table D-5 2030 Projected Water Demand (MGD)			
Source	Ground	Surface	Total
Public Supply	32.91	5.33	38.24
Public Supply/Domestic Self Supply	5.69	0	5.69
Commercial/Industrial/ Institutional Self Supply	.43	0	.43
Recreational (Golf Course)	.14	.93	1.07
Agriculture Irrigation Self Supply	4.55	2.37	6.92
Total	43.72	8.63	52.36

Source: SJRWMD 2008 Draft Water Supply Assessment

The primary water providers within the County are projected to use the following amount in 2030 to address the needs of their service population.

1. City of Bunnell (municipal)- 4.63 MGD
2. City of Flagler Beach (municipal)- 0.78 MGD
3. Dunes Community Development District (special district)- 1.29 MGD
4. Plantation Bay Utilities (private, but regulated by the PSC)- 0.90 MGD
5. Manufactured Home Communities- 0.32 MGD
6. Volusia County Utilities- 0.18 MGD
7. City of Palm Coast (municipal)- 16.451 MGD
8. City of Ormond Beach (municipal)- 0.31 MGD

Those residents who are not served by the centralized systems listed above will use domestic self supply as the primary source of potable water. This is a concern given that Flagler County is in a Priority Resource Caution Area. The impacts of additional draw down on the surficial and Florida aquifers from public supply and agricultural users severely limit opportunities for domestic self-supply users. This will have to be addressed through coordinated planning efforts with private and public water supply

entities and the local governments to protect natural resources and prevent undue costs on the users of domestic self-supply.

The Flagler County Water Supply Facilities Plan is incorporated and referenced in this and the Infrastructure Element to meet the requirements of Florida Statutes and to provide Flagler County with a technical document that guides future decisions regarding protection and use of the area's water supplies.

F. Conclusions and Recommendations

Flagler County will need to address groundwater supplies and protection of those supplies for their residents and agricultural businesses. Flagler County has identified the protection and support of the rural and agrarian lifestyle established in the area west of US 1. The potential for conflict between the users of the areas groundwater resources has been in place for several years. This is not projected to end within the 2010-2015 planning horizon. Conservation efforts, alternative water sources and reuse of wastewater are all elements of the Flagler County approach to address this issue. There will also need to be the implementation of development standards that emphasize "Green" development as a viable option. The County shall use the Water Supply Facilities Work plan and the SJRWMD Water Supply Assessment and Water Supply Plan in the development of land development regulations that further emphasize water conservation and "Green" development.

VI. DRAINAGE SUB-ELEMENT

Flagler County has an abundance of natural water bodies that provide for a diversity in plant and wildlife. These water resources also serve to address periodic flooding that results from the annual rain fall that occurs. In earlier years stormwater management plans primarily focused on piping or ditching the stormwater out of a development site unto other areas or downstream. The impacts of this approach can result in loss of property, ecological degradation and threats to public health. Florida has a regional approach to stormwater management and flood control that emphasizes protection of natural floodways and prevention of negative impacts resulting from development. This sub-element, together with the data and analysis of the Conservation Element, provides a description of Flagler County's drainage system.

A. Treatment Technology

During and after a rainstorm event, water, which has fallen, continues to flow under gravity in an effort to reach lower elevations. This flow may be broken into two parts: groundwater that has infiltrated into the earth, and direct stormwater runoff, which flows overland. Impermeable underground strata that limit the further downward movement of infiltrate (or the upward movement of a confined aquifer) is called an aquiclude. The aquiclude causes the lateral movement of groundwater that follows a hydraulic gradient through the pore spaces and voids of the surrounding medium. While groundwater discharges into stream channels and other water bodies are important, this takes place gradually over a longer time period than stormwater runoff.

The natural and/or man-made features that determine the path that stormwater runoff follows define the drainage system of an area. The largest feature of a drainage system is the drainage basin or watershed. The boundary of a drainage basin is determined by the topography of a region. The topographic high creates a ridge or drainage divide, which is the boundary level between separate drainage basins. All stormwater runoff within a watershed will be discharged at a common point downstream. In an open basin, this discharge may be out of the watershed as in stream flow; and in a closed basin, the discharge may be to a landlocked water body within the system. The volume of water being discharged at a particular point from a watershed over time through either a natural or man-made feature, constitutes an outflow hydrograph.

Other natural features of a watershed include floodplains, marshes, and swamps, where drainage occurs as sheet flow, sloughs, creeks, and streams which are typified by semi defined channels characterized by low volume flow and/or which may be perennial; rivers which have well defined channels moving large volumes of water; and lakes which are classified whether they have streams flowing into and/or out of them or are landlocked. Typically sloughs and creeks act as tributaries to rivers. The areas that define each tributary divide the drainage basin into many sub basins.

Sub-basins may also be defined by man-made features designed to convey stormwater runoff including swales, storm sewer, ditches and canals. These facilities direct runoff to downstream receiving waters, often diverting some of it for temporary or permanent

storage along the way. Temporary storage facilities, or detention areas, attenuate the flow of stormwater runoff by allowing its gradual release through an outlet control structure. Retention facilities permanently store stormwater runoff allowing its release only by evaporation and by percolation into the ground, with no direct discharge to surface waters. Some man-made facilities are designed to provide both detention and retention of stormwater runoff, such as a detention-over-retention system.

B. Regulatory Framework

Federal

Section 208 of the Federal Water Pollution Control Act (PL92-500, 1972) is that portion of the directing federal law with respect to water pollution abatement from non-point sources. In implementing the Act, EPA identified pollutants carried in stormwater runoff as a major source of water contamination. To achieve the pollution abatement goals of the Act, EPA provided assistance to state and local governments to develop Areawide Water Quality Management Plans, commonly known as “208 Plans”. 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.

The U.S. Army Corps of Engineers regulates dredge and fill activities in water of the United States and navigable water of the United States. Specific authority for this jurisdictional responsibility was provided by Section 404 of the Clean Air Act and Section 10 of the River and Harbors Act of 1899, respectively. Permits are required for filling activities in the waters of the United States. Permits are required for both dredging and filling activities in navigable waters of the United States. For minor or small-scale projects, nationwide or regional permits may be granted. This process is provided to allow certain activities to proceed with little, if any, delay or administrative work. For more substantial projects, individual permits may be required. If the Army Corps of Engineers determines that granting a permit would constitute a major federal action and that the proposed activity would have a significant effect on the human environment, an Environmental Impact Statement may be required.

A recent court decision has created a new level of regulation for local governments and Florida and its local governments will be the first to develop and implement new numerical maximum loads of specific materials. This is a controversial issue. The concern with the potential pollution is not at issue, but the ability to establish meaningful numerical standards and to be able to fairly and effectively implement those standards is the primary concern. This concern comes from the technical ability to gather data on levels of various pollutants and to determine the location and magnitude of the generator of the pollutants. This process will take several years, but it is anticipated that Flagler County will need to be ready to implement the standards by the end of the 2010-2015 planning horizon.

State

DEP has adopted a Stormwater Rule (Ch. 17-25, FAC) 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 runoff from the first inch of rainfall or, as an option for sites less than 100 acres in size, treatment of the first one-half inch of runoff.

Treatment is generally accomplished through retention or through detention with filtration. Retention requires the diversion of the required volume of runoff to an impoundment area 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 through sand filters prior to discharge to remove pollutants.

Exemptions to the permit requirements are provided for: 1) facilities serving individual sites for single family, duplex, triplex or quadraplex units; 2) facilities serving dwelling unit sites which are less than ten acres in total land area, have less than two acres of impervious areas, 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.

The DEP may delegate the permitting responsibilities to a local government or water management district subject to the provisions of Chapter 17-25.050, FAC. The agency which DEP has delegated stormwater permitting responsibility for the Flagler County area is the St. Johns River Water Management District (SJRWMD). The SJRWMD may establish, by administrative rule, alternative requirements provided the DEP determines these to be compatible with or more stringent than those imposed by Chapter 17-25, FAC.

Regional

Flagler County lies within the St. Johns River Water Management District (SJRWMD). Chapter 373 of the Florida Statutes established the State Water Resources Plan and created the SJRWMD. This statute also established a governing board. The governing board is empowered to adopt, promulgate, and enforce such regulations as may be reasonably necessary to effectuate its powers, duties, and functions consistent with the provisions of Chapter 120, F.S.

The SJRWMD has implemented four (4) sets of rules to regulate systems which manage and store surface waters: Chapter 40C-4, FAC (Management and Storage of Surface Waters), Chapter 40C-40, FAC (General Surface Water Management Permits), Chapter 40C-41, FAC (Surface Water Management Basin Criteria), and Chapter 40C-43, FAC (General Silvicultural Surface Water Management Permits after Notice).

Chapter 40C-4, FAC, provides for the regulation of projects that are above the thresholds explained in Section 3.3 of the Applicant's Handbook. The Handbook

establishes procedures that are to be followed and lists the criteria that must be met in order to obtain a permit. The criteria are broken into five components: peak discharge, discharge volume, storage and conveyance of stormwater, low flow and base flow maintenance and environmental considerations.

The first component requires that the post-development peak rate of discharge must not exceed the pre-development peak rate of discharge for the 25-year frequency, 24-hour duration storm. An exception to this rule is made for systems that discharge directly into either the Intracoastal Waterway or Atlantic Ocean. For such systems, there is no discharge design requirements.

The second component requires that there be no increase over the pre-developed condition direct runoff volume for the direct runoff volume resulting from the 25-year, 4-day storm event for systems discharging into landlocked impoundments which are adjacent to properties of more than one ownership.

The component relating to storage and conveyance concerns floodplain encroachment. These criteria prohibit systems from causing a net reduction in flood storage within a 10-year floodplain and also from causing a reduction in the flood conveyance capabilities provided by a floodway. Under these restrictions, a system is prohibited if it causes more than a one foot increase in the 100-year flood elevation immediately upstream, and it may cause no more than one-tenth of a foot increase in the 100-year flood elevation 500 feet cause no more than one-tenth of a foot increase in the 100-year flood elevation 500 feet upstream.

The fourth component concerns low flow and base flow maintenance. Regarding low flows, water management systems that impound a stream or other watercourse must meet certain low flow performance criteria so as to avoid negative impacts to adjacent streams, other impoundments or other water courses.

The base flow criterion recognizes the adverse impacts that may occur due to excessive lowering of the groundwater table. Therefore, systems are prohibited from causing the groundwater table to decline more than an average of three feet lower over the project area than the average dry season low water table and no more than five feet lower at any one location than the average dry season low water table. Systems are also prohibited from causing a drop in the groundwater table which results in a decrease in water elevation of adjacent surface water bodies below a minimum level established by the SJRWMD's governing board pursuant to Section 373.042, F.S.

The final component relates to environmental considerations. It states that hydrologically related environmental functions and water quality must not be adversely impacted. Wetlands are of primary concern. To protect water resources, systems must have no adverse impacts to off-site aquatic dependent species. Systems may not degrade water quality below the standards established in Chapters 17-3 and 17-4, FAC and the quality of water discharged off-site must comply with Chapter 17-25, FAC.

Chapter 40C-40, FAC, provides for a shortened permitting process for projects which are relatively small-scale in size and which meet the criteria established in Chapter 40C-4, FAC; these types of permits are known as “general permits.” Systems that are required to be permitted and which do not qualify for a general permit must be permitted under the provisions of Chapter 40C-4, FAC. Such permits are known as “individual permits.”

Flagler County Regulations

Article IV, Section 6.04 of the County’s Land Development Code (LDC) requires any new construction or improvements to existing structures to be at least 1 foot above the base flood elevation, among other provisions. This ordinance also requires that, in the coastal high hazard areas associated with wave impact, the lowest supporting horizontal member not be lower than 1 foot above the base elevation. It also prohibited alteration of sand dunes or mangrove stands and restricted the placement of fill material and structures adjacent to streams.

The County has also adopted Subdivision Regulations, Article IV, LDC requires developers to provide safe and suitable building sites that drain properly, helping to conserve and protect the physical and scenic resources of the County. This ordinance also includes a storm drainage system as part of the required improvements for development.

Another part of this Article, Section 4.04.05 requires drainage easements adequate for a storm drainage system along waterways, natural watercourses, and drainageways. Section 4.04.08 requires all storm drainage systems to conform to existing regulations regarding treatment and disposal. Waterfront developments had to adhere to the requirements for dredge, fill, and excavation permits, bulkheads, boat docks, piers, and waterways. Development in floodplains and unsafe lands was restricted by Section 4.04.10 of the County's LDC.

C. Coordination with Related Plans

State Comprehensive Plan

The State Comprehensive Plan requires regional and local comprehensive plans to reflect the goals and policies of the State Plan. Regarding the management of stormwater drainage, it is the State's policy to:

1. Maintain the functions of natural systems and protect the overall level of quality of surface water and groundwater.
2. Maintain and, where possible, restore to original condition the water of the State.
3. Protect and use natural water systems instead of structural alternatives.
4. Discourage the channelization, diversion or drainage of natural riverine systems.
5. Eliminate the discharge of untreated stormwater runoff into waters of the State.
6. Consider the impacts of land use on water quality and quantity and the potential for flooding.

7. Encourage the formulation of floodplain management practices which preserve and protect significant wetlands and other natural floodplain features.

Northeast Florida Strategic Regional Policy Plan

Consistent with State policies, the Northeast Florida Regional Planning Council has adopted goals and policies aimed at responsible stormwater management. For example, Goal 4.1 of the Northeast Florida Strategic Regional Policy Plan that was adopted in July of 1997, is to improve water quality in surface waters identified as Natural Resources of Regional Significance in the region to meet human and ecosystem needs, and achieve state water quality standards. The Regional Planning Council will implement various polices in an effort to reach this goal. Achievement will be measured based on the extent to which direct discharge of untreated surface water has been eliminated and the extent to which applicable state water quality standards have been met.

Municipal Comprehensive Plans

The incorporation of Palm Coast resulted in the city taking responsibility for the maintenance of the channelized stormwater system developed by ITT. This was used to drain areas for development of single-family lots. The ditches and canals drained into undeveloped area or the Intracoastal Waterway. There are still portions of this drainage system, as well as older systems in the unincorporated area between I-95 and the Intracoastal Waterway. Flagler County has established a drainage maintenance program as part of its annual operating budget. The County must continue to coordinate the development of the Capital Improvement Element and 5-Year Schedule of Capital Improvements with the City of Palm Coast and other surrounding entities to ensure an effective regional plan for the management of stormwater.

D. Current Conditions

The Atlantic Coastal Ridge divides Flagler County into two major drainage basins, the Upper East Coast Basin, and the Lower St. Johns River Basin.

To the east of the Atlantic Coastal Ridge, water from the mainland drains down a series of flat parallel ridge divides into low lying marshes and swamps, until it reaches the Intracoastal Waterway via creeks and streams. The water that drains into the Intracoastal Waterway is eventually discharged into the Atlantic Ocean via inlets. The closest inlet to Flagler County is the Matanzas Inlet, located three miles north in St. Johns County. Ponce de Leon Inlet is twenty-five miles south in Volusia County. Because of these distances, limited tidal flushing occurs in the wetlands adjacent to the Intracoastal Waterway.

The major wetlands in this area are Graham Swamp in the southern half, and Pringle and Hulett Swamps in the northern half. Due to the extensive storage provided by these flat swamplands, surface flows are typically very slow. However, natural drainage patterns have been somewhat altered by man-made canals and mosquito control

ditches. Because of the vast wetlands in the county, many miles of mosquito control ditches were constructed to reduce breeding sites.

Discharges occur into the Graham Swamp primarily via the Lehigh Canal, approximately one mile north of SR 100, the Little and Iroquois Canals, south of the County airport, and the Korona Canal, north of the Old Dixie Highway (U.S. Highway 1).

Discharge to the Intracoastal Waterway occurs at the St. Joe Canal in the north end of the swamp and via Bulow Creek across the Volusia County border to the Halifax River in the southern section. Bulow Creek is designated as Class II waters by DEP. Stormwater also collects and drains out of Graham Swamp through mosquito control ditches along the Intracoastal Waterway.

Much of the historical drainage patterns in this basin have been changed by the Palm Coast development and its system of swales and canals. Stormwater runoff is collected and diverted into the network of Palm Coast canals and is discharged into the swamps feeding Pellicer Creek, Bulow Creek and the Matanzas River. Pringle and Hulett are the largest of the swamps discharging into Pellicer Creek. They are drained by the Pringle and Hulett Branches, respectively. The Hominy Branch is the third main tributary of Pellicer Creek in Flagler County. It flows into Styles Creek that discharges into Pellicer Creek near its mouth. Pellicer Creek flows into the Matanzas River and forms part of the northeastern boundary of Flagler County. It originates near the confluence of the Pringle Branch, Dave Branch and Stevens Branch. The latter two cross into northern Flagler County from St. Johns County. However, much of the Dave Branch drainage basin lies within Flagler County.

Long Creek discharges into the Matanzas River just south of Pellicer Creek. Prior to the Palm Coast development, the Big and Little Mulberry Branches were its tributaries. The Little Mulberry branch no longer exists, and the Big Mulberry Branch now discharges into the Palm Coast canal system with limited flow into Long Creek only at flood stages.

Palm Coast also has several saltwater canals that tie directly into the Intracoastal Waterway. The overall canal network is a combination of a comb-structured canal system and a finger canal system.

Drainage on the barrier island consists primarily of overland flow into the Intracoastal Waterway or its adjacent swamps and wetlands or the Atlantic Ocean. There are also some canals and mosquito control ditches which collect runoff and discharge into the Intracoastal Waterway.

The Tomoka Marsh Aquatic Preserve and its associated marshes are designated Class II water and are located along the Intracoastal Waterway at the southern end of the county. The Tomoka River Basin is located primarily in Volusia County. However, a small portion of Lake Swamp and Hull Cypress Swamp in the southeast corner of

Flagler County drains into it via the Groover Branch and Little Tomoka River respectively.

The western portion of Flagler County is part of the Lower St. Johns River Basin. With the exception of agricultural irrigation ditches, drainage is largely still defined by natural conditions, namely swamps, creeks and streams. The area is poorly drained and large swamps predominate. These wetlands are not perched water tables but are the result of the surficial aquifer being filled to capacity. Also, the wetlands serve as a source of recharge to the artesian aquifers where their potentiometric levels are lower than the groundwater table and where passage through the primary aquiclude may occur.

Big Cypress Swamp in the northwestern section of the county, Black Branch and Sweetwater Swamps in the middle and Hull Cypress and Lake Swamps in the southeastern portions are the largest of the swamps in the Lower St. Johns River Basin.

Upper East Coast Basin:

The Upper East Coast Basin lies in the highly developed area of Palm Coast. The basin is composed of fifteen sub-basins each of which contain manmade drainage control structures such as canals and mosquito control ditches. It was the practice during the early and middle parts of this century to build miles of mosquito control ditches to reduce breeding sites. The natural drainage patterns within the Upper East Coast Basin are most significantly altered in Palm Coast through development and the systems of swales and canals. Palm Coast is dotted with saltwater canals that tie directly into the Intracoastal Waterway. Key natural and man-made features of the Upper East Coast Basin include:

1. Intracoastal Waterway;
2. Atlantic Ocean;
3. Matanzas River;
4. Major flood management wetland systems: Graham Swamp, Pringle Swamp, Hulett Swamps;
5. Discharge connectors to Graham Swamp: Lehigh Canal, Little Canal, Iroquois Canal, Korona Canal;
6. Discharge connectors to the Intracoastal Waterway: St. Joe Canal, Bulow Creek (in Volusia County);
7. Pellicer Creek;
8. Hominy Branch (tributary of Pellicer Creek), Styles Creek, Long Creek: discharges into Pellicer Creek;
9. Connectors/tributaries for the Matanzas River: Pringle Branch, Dave Branch, Stevens Branch;
10. Big Mulberry Branch (tributary of the Matanzas River) discharges into the Palm Coast canal system and Long Creek; and
11. Tomoka Marsh Aquatic Preserve and associated marshes (designated Class II Waters) connected to the Intracoastal Waterway.

Lower St. Johns River Basin:

The Lower St. Johns River Basin which covers the western portion of Flagler County is still largely defined by natural features such as swamps, creeks, and streams as opposed to man-made drainage systems. The major exception was the significant presence of agricultural irrigation ditches. Much of the basin is poorly drained and large swamps predominate. These large wetland systems serve as a source of recharge to the artesian aquifers. Some of the key features of this basin include:

1. Big Cypress Swamp (northwestern section);
2. Black Branch and Sweetwater Swamps (central section);
3. Hull Cypress and Lake Swamps (southeastern section);
4. Crescent Lake;
5. Crescent Lake Connectors: Haw Creek and its tributaries: Little Haw Creek, Middle Haw Creek, Sweetwater Branch, Parker Canal, and Black Branch Canal; and
6. Crescent Lake Connectors (northwestern Flagler): White Oak Branch and Salt Creek.

Sub-Basins of the Upper East Coast Basin and Lower St. Johns River Basin:

As mentioned, fifteen sub-basins are contained within the in the Upper East Coast basin. Most of the man-made stormwater control systems in the Upper East Coast Basin were initially constructed by Palm Coast and remain in generally good condition. These structures were designed to provide flood protection, protect of the quantity and quality of groundwater resources, maintain the historic water levels in upland freshwater swamps, and protect saltwater estuaries and tidal wetlands.

Flagler County's stormwater management responsibilities are limited to the unincorporated area and generally include only the construction and maintenance of roadway swales and ditches. The County also issues permits for new developments and subdivisions, in accordance with applicable State, Federal, and District regulations. The County's interest in maintaining compliance with applicable regulations has been codified in the Land Development Code. Section 5.03 of the Land Development Code addresses stormwater management, Section 6.02 addresses wetlands, and Section 6.04 addresses flood plains. These sections were adopted in 1992 to implement the County's Local Government Comprehensive Plan. These sections clearly express the intent of Flagler County to maintain local compliance with applicable permitting requirements of environmental review agencies. These sections do not establish any County standards which exceed the State and regional agency permitting. The level of service standard established for concurrency is the maintenance of on-site storage capacity for water resulting from the 25-year frequency, 24-hour duration design storm event.

The areas served by Plantation Bay and the Palm Coast systems are addressing water quality and quantity due to continued maintenance and upgrades to the systems to address federal and state laws. The Hammock area (beach communities) contain development that predates the County's current drainage regulations. Much of the land lies along the banks of the Intracoastal Waterway. These areas are drained by a

combination of surface drains discharging directly into the Waterway or through percolation into the sandy soils that are predominant in the area.

Other areas in the Hammock are served by a series of ditches that connect to the Intracoastal Waterway. These ditches were constructed primarily as a control of the mosquito population and have served only secondarily as a drainage system. The majority of this system lies in the Hammock Dunes DRI project area. As development takes place within the DRI project area, drainage control structures are being built to manage stormwater drainage in conformance with SJRWMD rules.

Western Flagler County, corresponding to the Lower St. Johns River Basin, drains in an east-to-west direction with Crescent Lake being the major receiving water body. Existing land uses are predominantly agricultural. Several small residential areas exist in this part of the county, but they are more rural in nature with home sites generally being one or more acres. Drainage for this vast area is by man-made canals that connect to the natural wetlands, sloughs and creeks. The canal systems were developed in some cases, by drainage districts that existed for a period of time but are now defunct. Other systems were constructed by individual landowners to serve their own needs. In some instances, these needs have changed over time and the canals have not been maintained. Very few of the canals in the system have been placed in the public domain through right-of-way dedications or maintenance easements to the County.

The largest development in the western area of the County is known as Daytona North. This residential area covers 3, 652 acres of land. The home sites are approximately one acre in size with 2,848 lots in the development. Drainage is by open swales, ditches and canals. This area has been placed in a special taxing district to create a means of maintaining and upgrading the road network and drainage system that serves the development. The County has successfully completed several improvements to the drainage systems along CR 305 and other areas as a method of addressing the flooding issues in Daytona North. This is a slow and incremental process that will continue through the 2035 planning horizon.

The natural resources of the western portion of the County do not appear to have been impacted by the drainage system that serves the area. Much of the area is used for farming that uses modern irrigation, drainage and fertilization. The drainage systems that have been developed over the years for the area are generally effective and accomplish the needs of those who make use of it. Crescent Lake is considered an outstanding water body and serves as a recreational amenity to local residents and visitors. Surface water quality monitoring in the Crescent Lake area has found evidence of pollution from stormwater runoff. Continued monitoring is needed to help determine the significance of the pollution.

Water quality sampling is done at 13 outfall points each month. These samples were analyzed for 15 parameters. Ten of these parameters have minimum standards adopted by the Department of Environmental Protection in Chapter 62-302 FAC. A review of water quality data for July 1996 indicates that water quality is generally adequate. The following parameters were within FDEP criteria for all sampling locations: fecal coliform, total coliform, chloride, BOD 5-day, specific conductance, temperature, pH and turbidity. Three of the sampling locations had excess levels of total phosphorus. All of the sampling locations reported less than minimum levels of dissolved oxygen.

E. Future Needs and Improvements

The stormwater infrastructure facilities that serve the urban areas of unincorporated Flagler County were constructed at the time of initial land development, except for the beach communities. These water management systems were developed between 1970 and the present time. Their capabilities were designed to meet the total needs of these areas served at complete buildout. The systems have been tested to a limited degree in that they have been subjected to several years of normal rainfall occurrences. However, a significant rainstorm event, such as a hurricane, has not occurred. As reported by 1998 DRI Annual Reports, there are currently no known deficiencies in the Palm Coast, Plantation Bay, Hammock Dunes, River Club (now called Grand Haven) or Matanzas Shores stormwater management systems.

The major receiving water bodies for the Upper East Coast Basin are the Intracoastal Waterway and its tributaries. A high level of water quality monitoring has taken place in this area during the past decade. The purpose of this effort has been to observe and assess the effects of stormwater discharges and other changes made in the watershed. The SJRWMD Water Management Plan (March 1995), reports that there are potential stormwater runoff problems near Palm Coast, and Beverly Beach, also in portions of Flagler Beach and Bunnell. As of 1995, the Report stated, Palm Coast is reusing stormwater and has a system of swales for runoff, while Beverly Beach is addressing stormwater runoff through master planning. In Flagler Beach, according to the Report, the sandy soils promote rapid percolation and therefore, flooding is only a temporary inconvenience to residents. Another potential problem area is septic tank leakage into the Intracoastal Waterway in the Hammock area. In addition, there is the potential problem of WWTP discharge from Flagler Beach into the Intracoastal Waterway, though no violations have been reported to date.

The western portion of Flagler County lies in the Lower St. Johns River Basin and is predominately agriculture and timberlands. One deficiency in this area of the county is the lack of maintenance to the existing surface water drainage system that has been developed over a long period of time. The County should identify to what extent this lack of maintenance is detrimental to the public interest and, if needed, devise appropriate strategies to make improvements. There are also streams and tributaries within the basin with elevated levels of pollutants as recorded by water quality monitoring stations. Much of the pollutants are the result of agricultural pesticides and fertilizers found in stormwater runoff.

No County funded infrastructure or capital projects pertaining to drainage or water management systems are identified by the Future Land Use Element or the Capital Improvements Element. Although there are some problem areas, in general, the level of service provided by the existing County drainage systems are satisfactory to meet current land uses. The agricultural use of the majority of the lands in Flagler County do not necessitate a highly developed drainage system. The limited areas that are more urban in character are able to handle their stormwater disposal through existing natural or manmade systems without exceeding their capacities. Public policy, as implemented by the County's Comprehensive Plan, land development regulations and the DRI process, require new development to provide for its own stormwater management facilities. Thus, the County's role in managing stormwater runoff is limited to maintaining ditches and swales that serve the immediate drainage demands of public roads.

F. Conclusions and Recommendations

Stormwater systems for the County's DRI projects are currently adequate. As a condition of development approval, DRIs must plan for and make available stormwater management systems to its anticipated population. The systems can be developed well ahead of the anticipated residential development, as was the case with the original Palm Coast DRI or are developed in stages, as is the case with Plantation Bay.

The beach communities and rural service areas were generally developed prior to the current stormwater criteria and do not have stormwater management systems in place. These areas are not subject to SJRWMD rules unless certain threshold levels of development are planned. The projected population growth and development densities in these two areas are not likely to require stormwater management system construction. There are existing problems within older subdivisions that will require coordination with the residents and the County in order to come up with a viable, financially-feasible way of constructing retrofitted systems.

The canal/ditch system that serves the large agricultural area of western Flagler County is an area of potential public concern. Since these waterways have not been maintained over the years, they have experienced decreased capacity of flow or, in some cases, complete blockage. It is recommended that the County determine which of these canals serve the public interest. Certain canals serve as primary drainage ways, which receive storm flows from a large number of properties. These properties are subject to damage or detrimental effects if the primary drainage ways are blocked or obstructed by downstream conditions.

The canals that serve a large public need should be placed in the public domain. Maintenance easement must be obtained so that vehicular access to the canals is possible. Periodic maintenance that assures the hydraulic capacities of the canals are retained should be a public function. The existing County staff can make the determination of which canals should become a part of the County maintained primary

drainage system. Their Engineering staff can also prepare right-of-way easements for these canals.

Aside from the potential need to acquire canal maintenance easements, there are no major capital improvement projects required for stormwater management systems within the western portion of unincorporated Flagler County. In the eastern portion of the County, the urbanized areas, drainage is served by either existing systems that provide adequate levels of service or are a part of the undeveloped but planned infrastructure of approved through the DRI process.

VII. NATURAL GROUNDWATER AQUIFER RECHARGE SUB-ELEMENT

This sub-element, together with the data and analysis of the Conservation Element, provides a description of Flagler County's aquifer system. In addition, current ground water management regulations and management practices are described along with recommendations for ground water management goals, objectives and policies.

A. Natural Systems and Operational Overview

Aquifers are water-bearing layers of porous rock and/or gravel. Several aquifers may be present below the surface separated by confining layers of materials that 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.

Since aquifer recharge areas are surface features, they are subject to alteration by development. Covering a recharge area with impervious surfaces, such as roads and parking lots, reduces the area available for rainfall percolation, thus reducing the rate of aquifer recharge. Increasing the rate at which stormwater drains from recharge areas also decreases recharge potential.

Another concern related to development within aquifer recharge areas is the potential for contamination of groundwater. Agricultural pesticides, chemicals, leaking sewage from treatment systems, and industrial wastes, can pollute the stormwater runoff that eventually reaches the aquifer. 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.

The Floridan aquifer underlies all of Flagler County. It is present at depths greater than 15 feet below the National Geodetic Vertical Datum (NGVD) of 1929 at three locations in the northern part of the County and at depths less than 50 feet NGVD in the south central part of the County.

Three main aquifers are present beneath Flagler County. These are the Upper Floridan Aquifer, the intermediate aquifer and the surficial aquifer systems. The upper part of the Floridan, comprising the Avon Park Formation, Ocala Formation and the dolomitic limestone of the Hawthorn Formation contains water under artesian conditions throughout the County. The intermediate aquifer is an artesian aquifer consisting of thin discontinuous lenses of permeable sand, shell, and limestone. The clays within the intermediate aquifer act as confining beds. The surficial aquifer lies above the intermediate aquifer. It is composed sand and shell deposits ranging in thickness from 20 to 50 feet. The Existing Conditions section of this sub-element describes the recharge characteristics of the aquifer and includes highlights of recent aquifer studies.

B. Regulatory Framework

Federal

The Federal Safe Drinking Water Act (FSDWA) (PL99-339), as amended on June 19, 1986, includes provisions for: (1) establishment of demonstration and grant programs designed to protect critical aquifer protection areas located within areas designated as sole or principal source aquifers, and (2) required states to adopt a state program to protect wellhead areas within their jurisdiction from contaminants.

Part 1428 of the FSDWA requires states to establish wellhead protection programs to protect groundwater supplies from contamination ensure public health and prevent the need for expensive treatment of wells to comply with drinking water standards. The Wellhead Protection program is a proactive effort designed to apply proper management techniques and various preventive measures to protect groundwater supplies. The underlying principle of the program is that it is much less expensive to protect groundwater than it is to try to restore it once it becomes contaminated.

State

The regulatory framework for aquifer recharge issues are delineated in Chapter 373.0391 Florida Statutes and Section 62-40.520, Florida Administrative Code. These regulatory provisions vest the responsibility for determination of water supply needs and sources and aquifer recharge planning and protection in the Water Management Districts. In addition to the powers granted under Chapter 373, the Department of Environmental Protection grants the Water Management District the authority to establish, administer, and enforce permit systems for consumptive uses of water and construction of wells and to establish minimum flows and levels for ground and surface waters, below which there would be significant harm to the water resources or ecology of the area.

The purpose of the Groundwater Discharge Rule (Rule 62-4.245, F.A.C.) is to protect the quality of ambient groundwater of G-I quality (potable water with a total dissolved solids less than 3,000 mg/l) and G-II quality (potable water with a total dissolved solids of 10,000 mg/l or less) by preventing degradation of the groundwater except within a zone of discharge. The rule specifically prohibits installations from discharging into groundwater, either directly or indirectly, any contamination that causes a violation of water quality standards and criteria for the receiving groundwater as established in Chapter 17-3, Part IV, F.A.C. The rule prohibits zones of discharge associated with wells (except for recharge wells) and sinkholes.

Within a G-I groundwater zone, State authorized domestic wastewater and stormwater sites have a zone of discharge extending no more than 100 feet from the site boundary or to the installation's property boundary, whichever is less. No zone of discharge is allowed when the discharges may cause an imminent hazard to the public or environment through contamination of underground supplies of drinking water or surface water affected by groundwater.

Agricultural fields, ditches and canals, as well as livestock waste lagoons and stormwater facilities, are exempt from obtaining a permit to establish a zone of discharge. However, if stormwater threatens to violate groundwater standards or threatens the quality for contiguous waters, then the installation owner will be required to obtain a permit and to define an appropriate zone of discharge and institute appropriate monitoring plans.

Installations exempt from obtaining permits are required to develop a monitoring plan. The monitoring plan is required to show the locations of the proposed unaffected natural background and downgradient monitoring wells, a water sampling and chemical analysis protocol which can determine background quality of the groundwater in the vicinity of the site, and any deviations in the receiving quality of the groundwater in the downgradient monitor wells. Based on the results of water quality sampling the installation owner may be required to clean up or otherwise increase the degree of treatment prior to the discharge and correct the violation of water quality standards.

According to the Flagler County Sole Source Aquifer (Rule 62-3.501, F.A.C.) the surficial aquifer in Northeast Flagler County has been designated a sole source aquifer under Rule 62-3.501, F.A.C. This designation allows for the limitation of treated wastewater and stormwater discharge in the designated area.

The Groundwater Injection Rule (Chapter 62-528, F.A.C.) was established by the Florida Legislature for facilities which inject fluids directly underground (Chapter 62-528, F.A.C.), which are based on federal regulations (EPA Underground Injection Control). These regulations classify injection wells into five groups or classes.

The permitting of Class I (Hazardous, Municipal and Industrial Waste) and Class V (miscellaneous experimental technology) injection wells is applicable in Flagler County under provisions of Chapter 17-28, FAC.

No Class I wells (which inject fluids beneath the lowermost formation containing an underground source of drinking water within 1/4 mile of the well bore) are currently known to exist in the county. Many Class V wells (which include air-conditioning return flow wells used to return the water used for heating and cooling to any aquifer, i.e., heat pumps, and recharge wells) exist in Flagler County. They are permitted under Chapter 62-28, F.A.C. and are defined as injecting nonhazardous fluids into or above Formations that contain underground sources of drinking water.

Regional-St. Johns River Water Management District (SJRWMD)

The task of identifying the nature and extent of groundwater resources available within Florida has been assigned to the regional water management districts, pursuant to Section 163.3177(6)(c), F.S. As directed by this state law, the SJRWMD has prepared a Groundwater Basin Resource Availability Inventory (GWBRAI) for use by local governments to help plan for future development in a way which will reflect the limits of available resources.

The GWBRAI includes a hydrogeologic study to define the groundwater basin and its associated recharge areas, the identification of prime groundwater recharge areas and areas prone to contamination resulting from current development or planning. In addition, the GWBRAI contains criteria for establishing minimum seasonal surface and groundwater levels and identifies existing sources of wastewater discharge suitable for reuse. The document also identifies quantities of water available for consumption uses. The GWBRAI is a useful tool for local governments when evaluating the suitability of land for development.

Another aspect of the of the SJRWMD water management responsibilities is the administration of Chapter 40C-2, F.A.C. This rule requires reuse of reclaimed water, where feasible. Sections of this rule, which became effective in 1991, include conservation requirements aimed at managing demand for potable water. Reuse of reclaimed water, where feasible, is among these requirements. All consumption use permit (CUP) applicants must meet the following requirements in order to obtain a CUP from SJRWMD:

1. When reclaimed water is readily available it must be used in place of higher quality water sources unless the applicant demonstrates that it is not economically, environmentally, or technically feasible.
2. The lowest acceptable quality water source must be utilized for each consumption use. To use a higher quality water source an applicant must demonstrate that the use of all lower quality water sources will not be economically, environmentally, or technically feasible.
3. All available water conservation measures must be implemented unless the applicant demonstrates that implementation is not economically, environmentally or technically feasible.
4. When reclaimed water is readily available it must be used in place of higher quality water sources unless the applicant demonstrates that its use is either not economically, environmentally, or technically feasible.

SJRWMD also requires the applicant, as part of the application process for most types of water uses, to submit a water conservation plan.

SJRWMD promotes increased availability of reclaimed water through the conservation plan requirement in its CUP rule. Public water suppliers who also operate wastewater treatment facilities are encouraged to make reclaimed water available as part of their required water conservation plans, when it is economically feasible.

In addition, the SJRWMD implements rules that address Priority Resource Caution Areas. Subsection 62-40.401(5), F.A.C., requires the water management districts to designate water resource caution areas as regions where reuse would be required if economically, environmentally, and technically feasible. The SJRWMD requires water reuse in the entire District. However, as part of the SJRWMD Water Supply Needs and

Sources Water Assessment report (1994), it designated approximately 38% of the District a Priority Water Resource Caution Area (PWRCA). In Flagler County, the only area with this designation is in the Palm Coast area. Such areas are where water supply problems currently exist or where withdrawals proposed to meet demands for the year 2010 are projected to result in significant harm to ground or surface water resources if allowed to develop without additional conservation measures.

County

The County has adopted Subdivision Regulations, Article IV, Land Development Code (LDC) that limits development in wetland and flood plain areas and require developers to provide a storm drainage system as part of the required improvements for development. The LDC also requires drainage easements adequate for a storm drainage system along waterways, natural watercourses, and drainageways. In addition, the LDC requires all storm drainage systems to conform to existing regulations regarding treatment and disposal.

C. Coordination with Related Plans State Comprehensive Plan

The State Comprehensive Plan, Chapter 87, F.S., sets long range goals and policies for the orderly physical growth of the State. It is a goal of the State Plan to assure the availability of an adequate water supply while maintaining the functions of natural systems. The Plan specifically addresses the need to maintain the overall present level of surface and groundwater quality.

Northeast Florida Strategic Regional Policy Plan

The Northeast Florida Strategic Regional Policy Plan was adopted in July of 1997. The Plan contains several goals with supporting policies aimed at protecting ground and surface water resources. For example, Regional Goal 4.2 is “ Assure the adequate supply of water both in quantity and quality for present and future human, economic development, and ecosystem needs”. This goal is supported by Policy 4.2.1 which supports the use of water conservation measures and Policy 4.2.6 which is to ensure new development is compatible with existing local and regional water supplies and needs.

Municipal Comprehensive Plans

Flagler County adopted groundwater/aquifer protection standards in the adopted Land Development Code and has consistently applied them with all new applications for development. The important aspect for the 2010 to 2035 planning horizon is to ensure that there is consistency of data that is shared with other local governments. This will result in a consistent and equitable application of land development regulations.

D. Current Conditions

The most significant recharge area of the upper Floridan aquifer in Flagler County is the DeLand Ridge, which lies outside the County. Recharge to Flagler County from the DeLand Ridge to the west is estimated to range from 0.9 inch per year to 2.6 inches per year. Within Flagler, recharge to the upper Floridan aquifer is estimated at a range of 0

to 1 inch per year. One reason for such minimal recharge is the high levels of evapotranspiration (combination of plant transpiration and natural evaporation). The evapotranspiration rate for Flagler County is estimated to be greater than 35 inches per year, while the annual average rainfall is approximately 50 inches per year. Discharge of the aquifer occurs in topographically low areas along the east coast, in the Crescent Lake area and in the Haw Creek Basin. Discharge also occurs through upward seepage, free flowing wells and through pumpage for irrigation and public water supply.

The intermediate aquifer receives recharges from either the upper Floridan aquifer or from the surficial aquifer. The amount of recharge to the intermediate aquifer system is dependent upon its degree of confinement and the head differentials between the aquifer and those systems above and below it.

The surficial aquifer system receives recharge from rainfall and by upward movement of water in from the upper Floridan aquifer. Most recharge areas occur in low-lying areas, where the land is poorly drained. Water in the surficial aquifer is discharged through evapotranspiration, pumpage, and lateral seepage into canals, streams, and the ocean, as well as downward into the intermediate aquifer system.

The SJRWMD continues an aggressive program of research into water needs and sources. In addition, the District maintains an active effort directed toward end-user education, conservation, and wise use of water resources. Agricultural water use continues to be an important water use in Flagler County. Agricultural use may draw large amounts of water, but the use continues for a short duration.

The SJRWMD has analyzed water quality using chloride concentrations of water from wells in the surficial aquifer as part of this analysis. The findings indicate concentrations of chlorides in the surficial aquifer in the Hammock area. A separate analysis included measurements for chloride concentrations and hardness in milligrams per liter. High concentrations of both attributes were found in a well northeast of Black Branch in the middle of the County. Relatively low indicators were found in wells near Korona and Crescent Lake. High concentrations of chlorides were indicated at wells near the coast.

Based on information collected by the SJRWMD, approximately 20% of Flagler County consists of areas where the aquifer discharges into surface waters (generally swamps, lakes, or rivers). An estimated 50% of the land in the county has an aquifer recharge rate of 0 to 4 inches per year. Approximately 25% of the County has a recharge rate of 8 to 12 inches per year, and about 5% of the land area has a recharge rate of 12 or more inches per year. The areas of highest recharge in the range of 8 to 12 inches per year occur in the southern and southeastern parts of the County, and in the area near Black Branch Swamp.

E. Future Needs and Improvements

Based upon a review of documents produced by the SJRWMD, aquifer recharge issues are addressed principally through monitoring and limitations on aquifer drawdowns. According to the Needs and Sources Assessment published by the SJRWMD, water resource problems related to saltwater intrusion were considered to be critical or are

anticipated to become critical in the coastal area of the county. In practice, the level for definition of critical saltwater intrusion problems was identified as the 250-mg/L isochlor, which is the U.S. EPA recommended limit for chloride concentrations in drinking water. The increasing population and expansion urban development has resulted in increasing impacts to the aquifer. The SJRWMD designated Flagler County as a Priority Resource Caution Area due to the threats from overuse of groundwater resources.

The Flagler County land development regulations have identified the need for wellhead protection measures to protect water quality. The County's well head protection policies are consistent with existing federal, state, and regional regulatory standards. .

Increased development leads to the increased potential for contamination of groundwater supplies. This typically occurs from septic systems leaching water into the surficial aquifer system. Petroleum products, especially leaking underground storage tanks, are potential problems as well. Also, there are potential problems associated with landfills and the use of chemical sprays and pesticides. Another potential problems is the recharging the surficial aquifer with highly mineralized irrigation water.

There are a variety of state, local and regional regulatory measures that help mitigate the potential for groundwater contamination. Florida Administrative Code 10d-6 specifies design and siting requirements for septic tanks to ensure wastewater is properly treated and that the tanks are a suitable distance from potable water wells. In addition, Flagler County has adopted a septic tank siting ordinance to address the siting of wells and septic tanks to address siting issues not addressed by 10d-6, F.A.C. There are also regulatory measures that require gas stations to replace single lined underground petroleum tanks with stronger double lined tanks so as to minimize the risk of underground leakage. Regarding leakage of landfills, state administrative rules are in place that requires the installation of wells to monitor groundwater quality in the vicinity of landfills. The rule also provides for corrective actions to take place in the event that groundwater pollution is detected. The SJRWMD water reuse requirements help to limit the amount of water withdrawn from the aquifer for irrigation purposes. The reuse regulations also address water quality issues.

F. Conclusions and Recommendations

The SJWMD has identified two primary issues related to the management of groundwater supplies. This first is that there will be water supply shortages in some areas of the District if withdrawals continue without conservation efforts. The second is that there will be increased costs to develop alternate water sources to meet projected needs.

The District is addressing both of these issues by involving as many affected individuals as possible through an outreach program involving all types of media, meetings, workshops and publications. The objective of the outreach program is to convince the general public and government officials of the need to develop alternate water supplies and to involve them in the selection of alternatives with full knowledge of the costs.

Actions the County can take to promote water conservation and improved management of ground water supplies are listed below.

Strategy 1: Flagler County should continue its participation with the SJRWMD as an active partner in the development of alternative water resources and establishment of best management practices to conserve traditional water resources.

Strategy 2: Flagler County should continue to support the plugging of abandoned, nonvalved, and improperly cased wells.

Strategy 3: Flagler County should review land use controls around wellfields to insure that all land uses which could inadvertently cause contamination of the water recharging the wellfield are prohibited.

VIII. SOLID WASTE SUB-ELEMENT

This sub-element, together with the data and analysis of the Conservation Element, provides a description of Flagler County's solid waste management system. In addition, current solid waste management regulations and management practices are described along with recommendations for solid waste related goals, objectives and policies.

Flagler County currently exports all of its solid waste to Volusia County via private collection companies. This is a typical situation where a local government does not have the existing facilities available for its residents. It is often cost-prohibitive to establish a new solid waste disposal site. The critical aspect is timing. The current c

A. Technical and Operational Overview

According to Section 9J-5.003, FAC, "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.

"Hazardous waste" means solid waste, or a combination of solid wastes, which, because of its quantity, concentration, 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.

For the purpose of this Sub-Element, the following additional terms are defined:

Residential wastes are mixed household wastes, including yard wastes, generated by the general populace.

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.

Transfer station refers to a facility for the temporary collection of solid waste prior to transport to a processing plant or to a final disposal site.

Processing plant refers to a facility designed for incineration, resource recovery or recycling of solid waste prior to its final disposal.

Landfill refers to the final disposal site of solid wastes and as it implies, involves burial of the wastes. Landfills are classified for regulatory purposes according to the characteristics of the wastes they are permitted to receive.

B. 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 Protection (DEP), and where dredging and filling may occur, by the U.S. Army Corps of Engineers. The St. Johns River Water Management District (SJRWMD) also provides state level review for water quality and quantity impacts. Actual construction and operation of solid waste facilities require further permits and review by DEP. For processing plants which will generate electrical power and require tall emission stacks, further DEP and Federal Aviation Administration (FAA) review may be required.

For hazardous wastes, the national Resource Conservation and Recovery Act (RCRA) of 1976 directed EPA to develop a national program to regulate and manage hazardous wastes 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.

More recent regulatory requirements include the Clean Air Act Amendments of 1990, signed into law as P.L. 101-549 on November 15, 1990. This law represents the most significant development in environmental legislation in years. Only two prior clean air legislative efforts are comparable in magnitude--the Clean Air Act of 1970 and the 1977 Clean Air Act Amendments.

The 1990 Amendments contain seven separate titles covering different regulatory programs. Although the 1990 Amendments significantly alter and add to the regulatory requirements of the Clean Air Act, the basic framework and procedural aspects of the Act have remained as established by the 1970 Act and 1977 Amendments. A major section of the old Act that has remained substantially unchanged is the provision for standards of performance for new stationary sources (New Source Performance Standards or NSPS).

The New Source Performance Standards process requires the EPA to list categories of stationary sources which "cause, or contribute significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare." The NSPS program sets uniform emission limitations for industrial categories or subcategories of sources, including emission standards for landfills. The standards generally must be stated in terms of maximum amounts of emissions. These standards apply to all pollutants

emitted by the source category. Landfills are covered under Title V of the NSPS which requires an operating permit to address land fill gas collection and control standards..

State

At the state level, the Florida Resource Recovery and Management Act (Sec. 403.7, F.S.), passed in 1980 adopted federal guidelines and directed DEP 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) an annual inventory of large hazardous waste generators; 4) permit requirements regulating treatment, storage and disposal of hazardous wastes; 5) funds for hazardous waste spill and site clean-up; 6) hazardous waste management facility site selection procedures; and, 7) fines and penalties for violators.

Amendments to the Resource Recovery and Management Act provide funds and direction for the establishment of a cooperative hazardous waste management program between local regional and state levels of government. These changes included provisions for county-level hazardous waste managements assessment, regional and statewide facility needs assessments, and site selection for hazardous waste management facilities at the county, regional and state levels.

Local

At the county level, Flagler County's Road and Bridge Department is responsible for planning and management of any solid waste facilities serving the County. This includes processing permit applications for new facilities and ensuring that existing facilities are operated in conformance with permit requirements and in compliance with water quality objectives.

C. Current Conditions

Flagler County has delegated the majority of its solid waste collection services and waste disposal responsibilities to third parties. A private hauler, Jennings Environmental, Inc. which took over from BFI, INC, provides solid waste collection in the unincorporated County. in 1996. Jennings Environmental has an exclusive waste collection contract with the County. Garbage service for residential land use is provided twice weekly, with trash pick-up once a week. Jennings also provides garbage service for commercial land use. After collection, Jennings hauls the garbage to the Volusia County landfill. The landfill is located approximately 15 miles south of Flagler County. Volusia County operates this landfill. Flagler County waste is accepted at a 50% surcharge above the prevailing rate.

Yard waste and other debris is disposed of at the County's Class III (construction and demolition debris) landfill in Flagler County. This facility is located on Old King's Road, south of the old (closed) Class I landfill. The Class III landfill is managed by the Solid Waste Division of the Flagler County Road and Bridge Department. The landfill serves all land uses within Flagler County.

Flagler County collects hazardous waste, for ultimate disposal by a private contractor. There is one hazardous waste collection site, located at the old County landfill. This site is in eastern Flagler County, near the main population center. The largest components

of the waste stream included floor sealer, paint and oil. The hazardous waste collection site serves all land uses within Flagler County.

The collection of materials suitable for recycling is done by the private hauler as part of their solid waste collection contract with Flagler County. The hauler collects materials from residential and commercial customers.

Waste disposal statistics kept by the Solid Waste Division of the Flagler County Road and Bridge Department show that in 1997 the County generated a total of 41,120 tons of landfilled Municipal Solid Waste (MSW). The Volusia County landfill has adequate capacity to accommodate the Flagler County solid waste stream until well past the year 2015. The current agreement between Flagler County and Volusia County allows Flagler County to deposit its solid waste in the Volusia County landfill for the next 20 years.

In 1988, the Florida Legislature mandated a 30% recycling goal for each county in Florida by 1994. The Legislature later modified the Act to exempt all counties under 50,000 from having to comply with the goal mandate. Flagler County's total population exceeded 50,000 by the year 2005, the County must meet the 30% recycling goal so that it will be in compliance with state law. In recent years, Flagler County has been very successful with its recycling program.

Generators of hazardous waste can be classified in the following manner: small quantity generators, large quantity generators and individual households. Flagler County operates a hazardous waste drop-off site for household hazardous waste located at the old County landfill. This waste is disposed of under contract to a private hauler. Small quantity generators are defined by the Resource Conservation and Recovery Act (RCRA) as any entity that generates less than one ton of hazardous waste in any month. Examples include auto repair shops, printing companies and dry cleaners. Small quantity generators must dispose of their hazardous waste in accordance with state and federal regulations. Flagler County is required to survey and visit 20% of its small quantity generators each year to monitor regulatory compliance and to collect disposal statistics. The County has just begun its small quantity generator program; therefore, there is no information on the extent to which hazardous waste regulations are being complied with.

Large quantity generators are defined by the Resource Conservation and Recovery Act (RCRA) as any entity that generates more than one ton of hazardous waste in any month. There are two ongoing businesses in Flagler County that are large quantity generators. HP Reid, a wire manufacture in Palm Coast generated 65.3 tons of hazardous waste in 1997. The waste was composed of organic and inorganic solids and liquids used in the manufacturing of wire and wire coatings. Sea Ray Boats, also in Palm Coast generated 18.5 ton of hazardous waste in 1997. Waste from this company includes such items as used solvents and discarded fiberglass with resin. Regulatory compliance of large scale hazardous waste generators is administered by DEP.

D. Future Needs and Improvements

Solid Waste Facilities:

As mentioned, Flagler County has a 20-year agreement to deposit its solid waste in the Volusia County landfill. The Volusia site, encompassing several hundred acres, is the final disposal location for all Class I solid waste generated in Flagler County. The 20 year agreement was based the determination that the landfill would have the capacity to accommodate Flagler County's disposal needs for the time period contracted for. The Volusia County landfill is currently in conformance with its operating permit and is expected to remain in compliance through the year 2015. The period from 2015 to 2035 will require additional space at the Volusia County landfill and increased recycling.

Hazardous Waste Management:

Flagler County operates one hazardous waste collection site, located at the old County landfill only a very small portion of the landfill site is used for hazardous waste management/storage. Hazardous waste taken to the site is collected by a private hauler for disposal. As the volume of hazardous taken to the site increases, there is ample acreage to accommodate expanded facilities. The hazardous waste dropoff site is operating in conformance with State and Federal hazardous waste regulations. Also, rather than expand, the County has the option of increasing the frequency of pick-ups by the private hauler. For these reasons, the hazardous waste capacity of the County is considered adequate through the year 2035.

Recycling:

Recycled materials are collected by a private hauler and taken to the Volusia County landfill for separation. The several hundred-acre landfill site can easily accommodate any future expansion that may be needed to handle increased volumes of recyclables.

F. Conclusions and Recommendations

With ample capacity available at the Volusia County landfill, it is highly appropriate for Flagler County to continue hauling its solid waste to the landfill for the next 20 years.

It is also highly appropriate for the County to continue operating its hazardous waste drop-off facility. The current facility site is large enough to accommodate any hazardous waste facility expansions that may be needed in the future.

Regarding recycling issues, the County should consider expanding its recycling effort to include some of the more rural areas of the County. For example, one or more recycling drop of stations could be established in the western part of the County. Also, the County could consider establishing a composting program for organic materials such as brush, trees and yard waste. By adding additional opportunities for recycling, the County will move closer to reaching its 30% recycling goal.

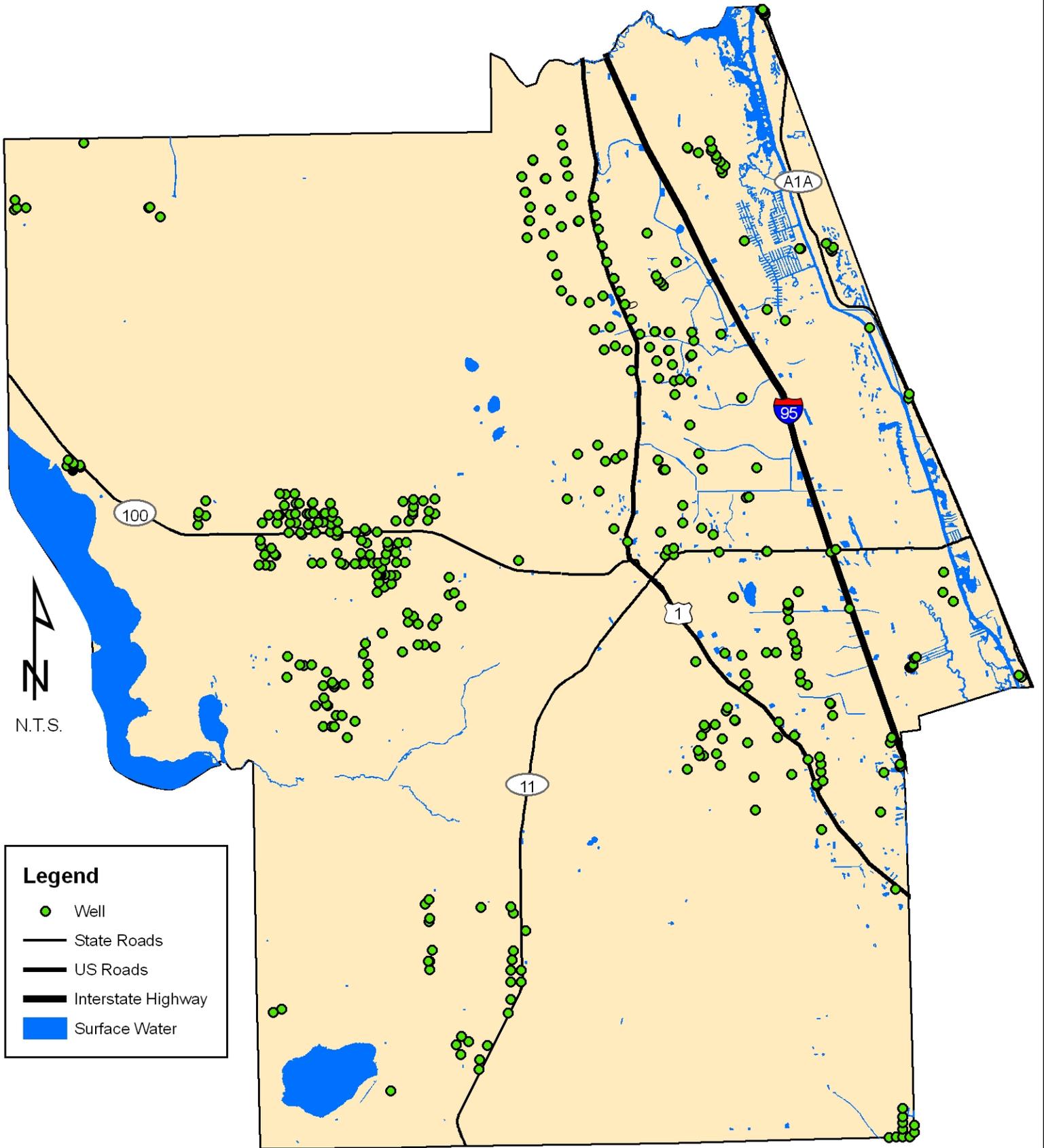
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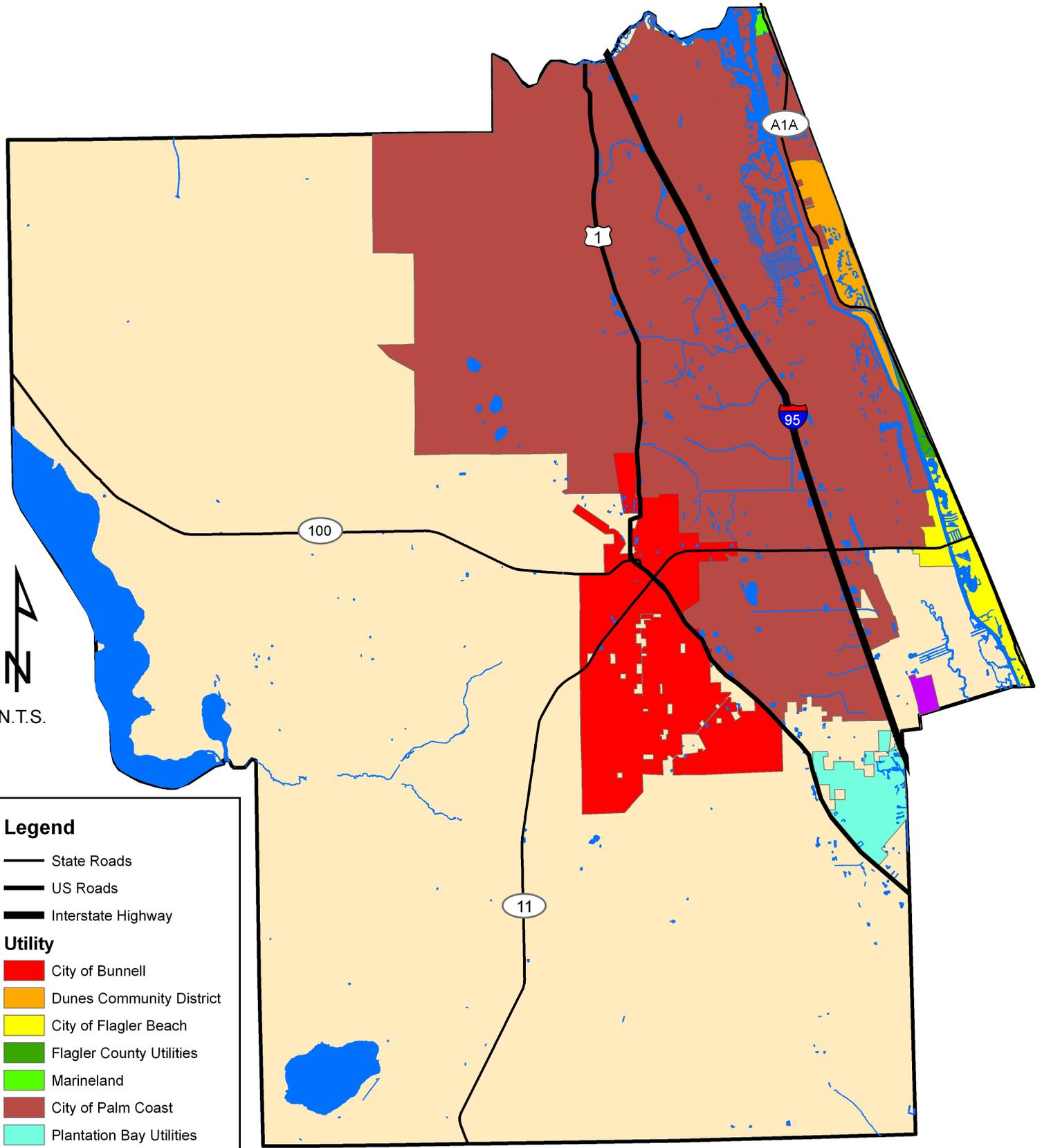
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PUBLIC SUPPLY WELLS 2007



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COUNTY WIDE SERVICE AREA BOUNDARIES 2006



Legend

- State Roads
- US Roads
- Interstate Highway

Utility

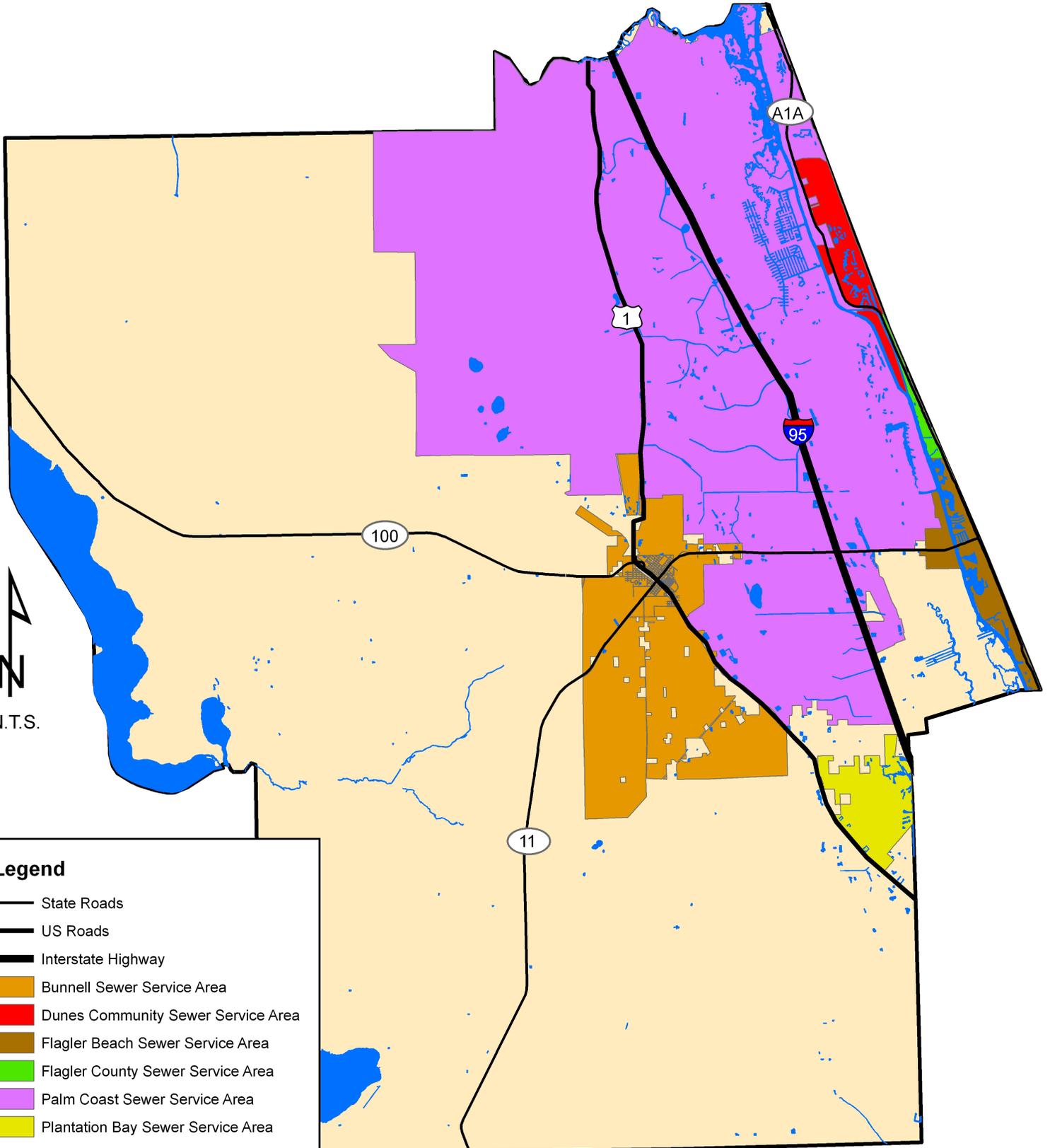
- City of Bunnell
- Dunes Community District
- City of Flagler Beach
- Flagler County Utilities
- Marineland
- City of Palm Coast
- Plantation Bay Utilities
- Volusia County Utilities



N.T.S.

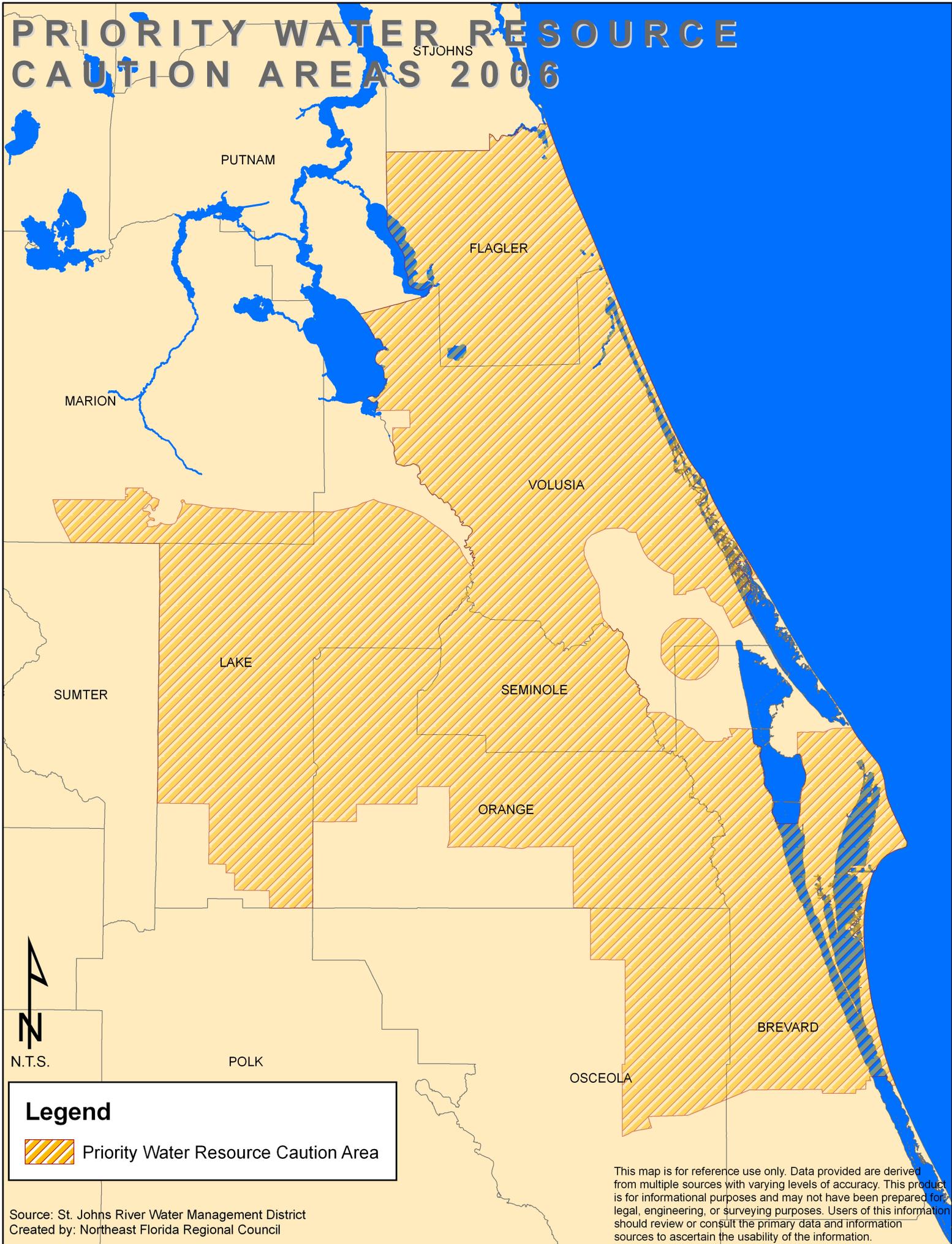
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AREAS SERVED BY CENTRALIZED SANITARY SEWER SYSTEMS



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PRIORITY WATER RESOURCE CAUTION AREAS 2006

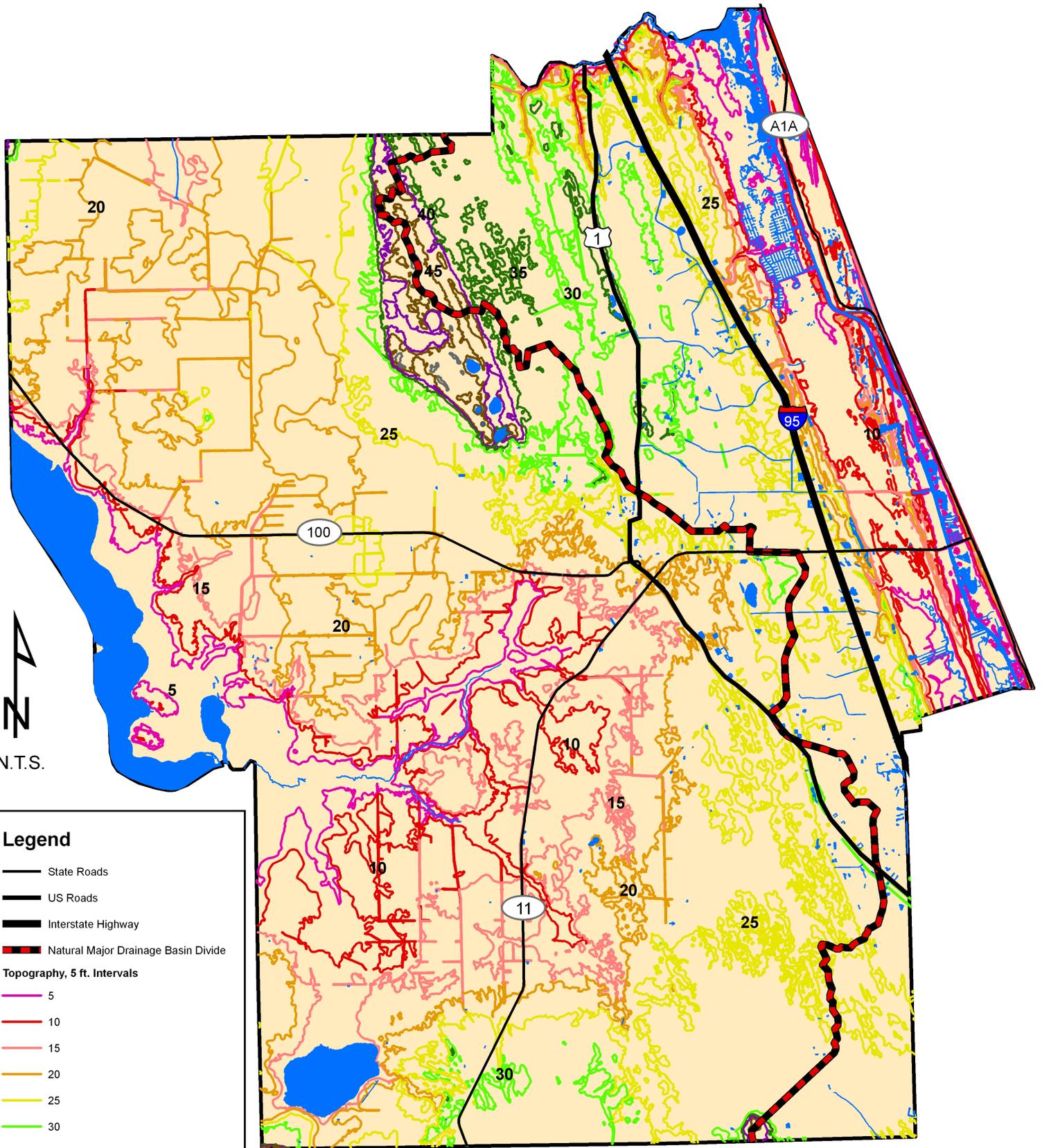


Source: St. Johns River Water Management District
Created by: Northeast Florida Regional Council

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TOPOGRAPHY OF FLAGLER COUNTY

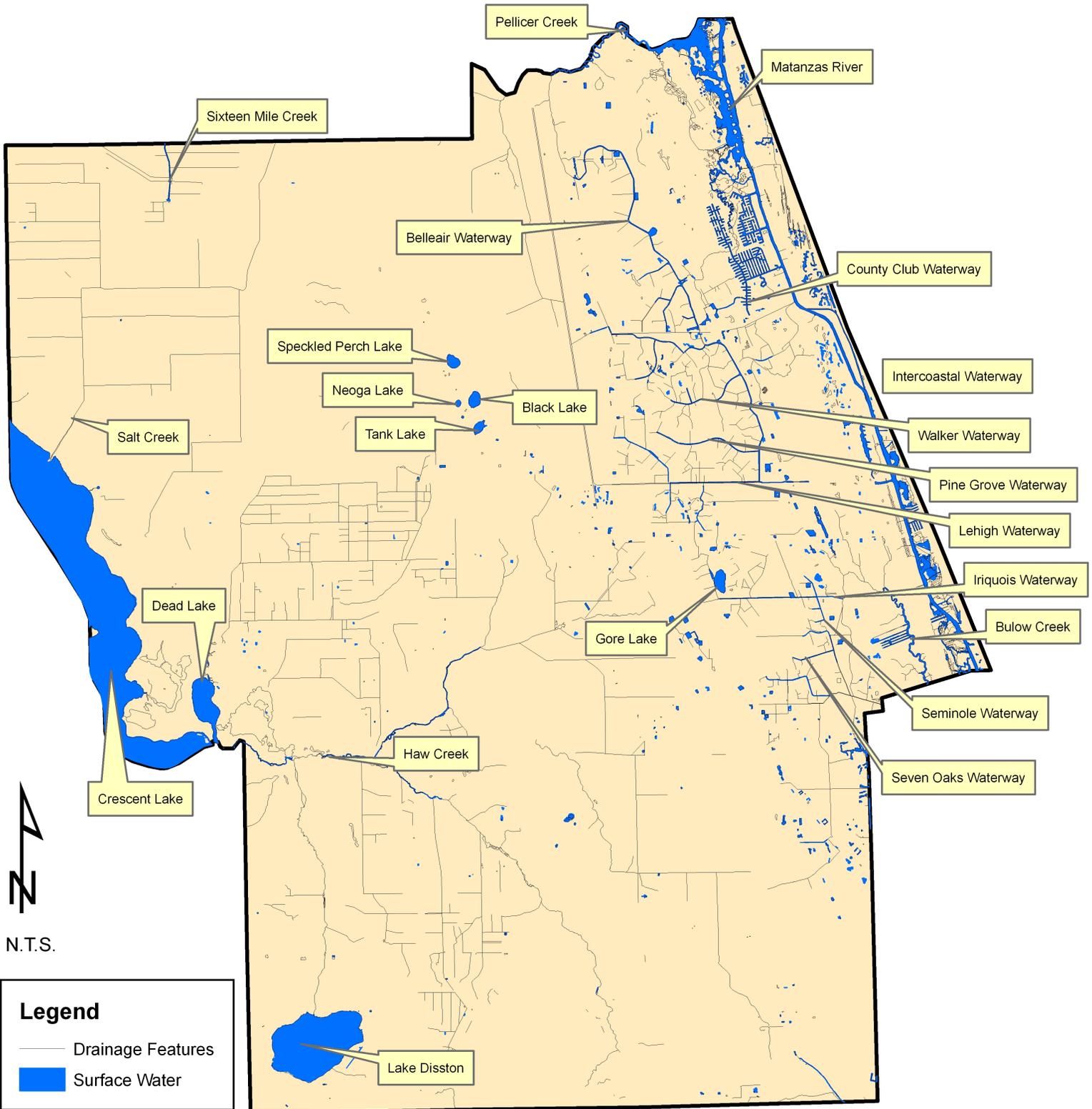


Legend

- State Roads
- US Roads
- Interstate Highway
- Natural Major Drainage Basin Divide
- Topography, 5 ft. Intervals**
- 5
- 10
- 15
- 20
- 25
- 30
- 35
- 40
- 45
- 50

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NATURAL AND MAN-MADE DRAINAGE FEATURES

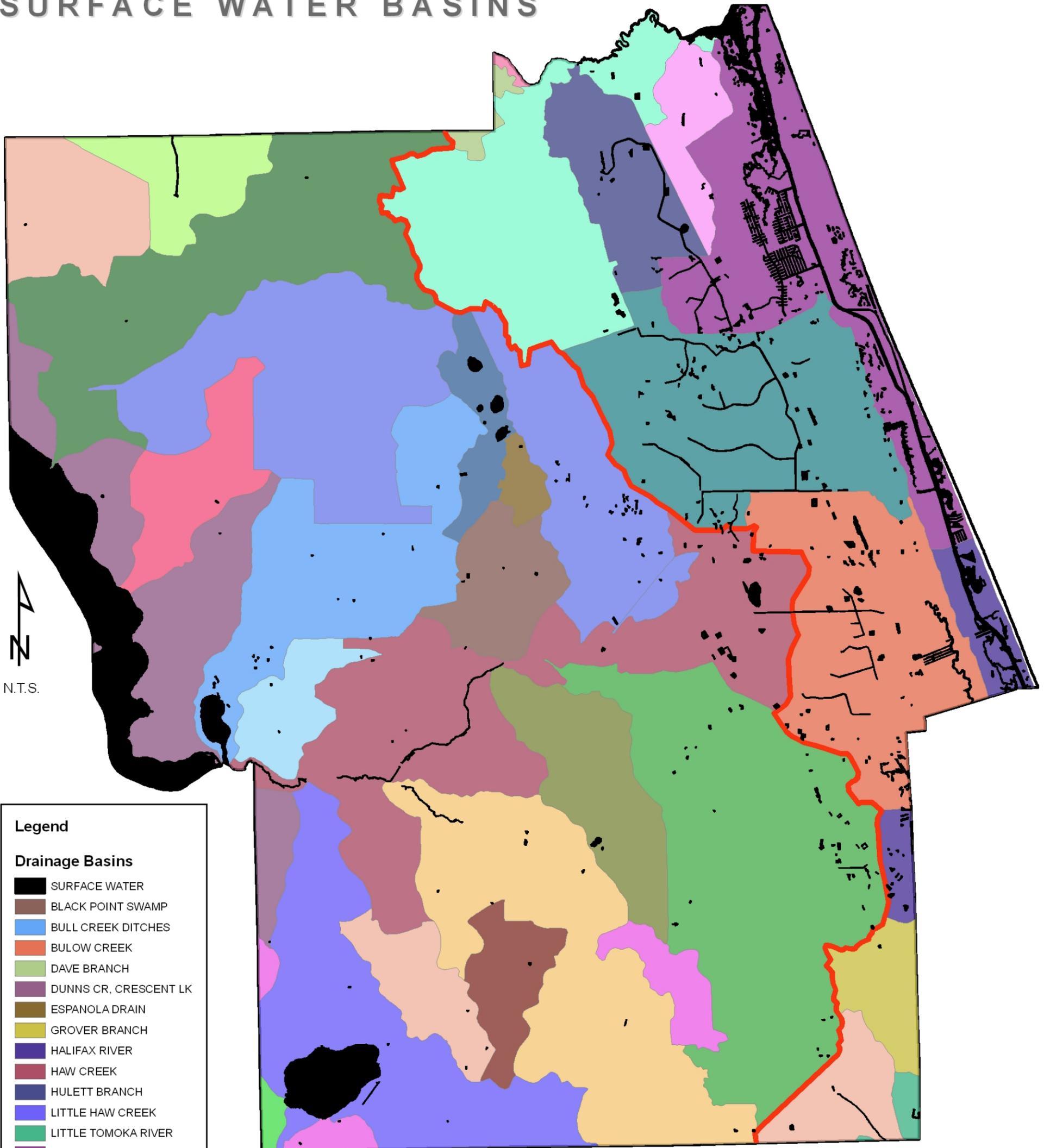


Source: St. Johns River Water Management District
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SURFACE WATERS & SURFACE WATER BASINS



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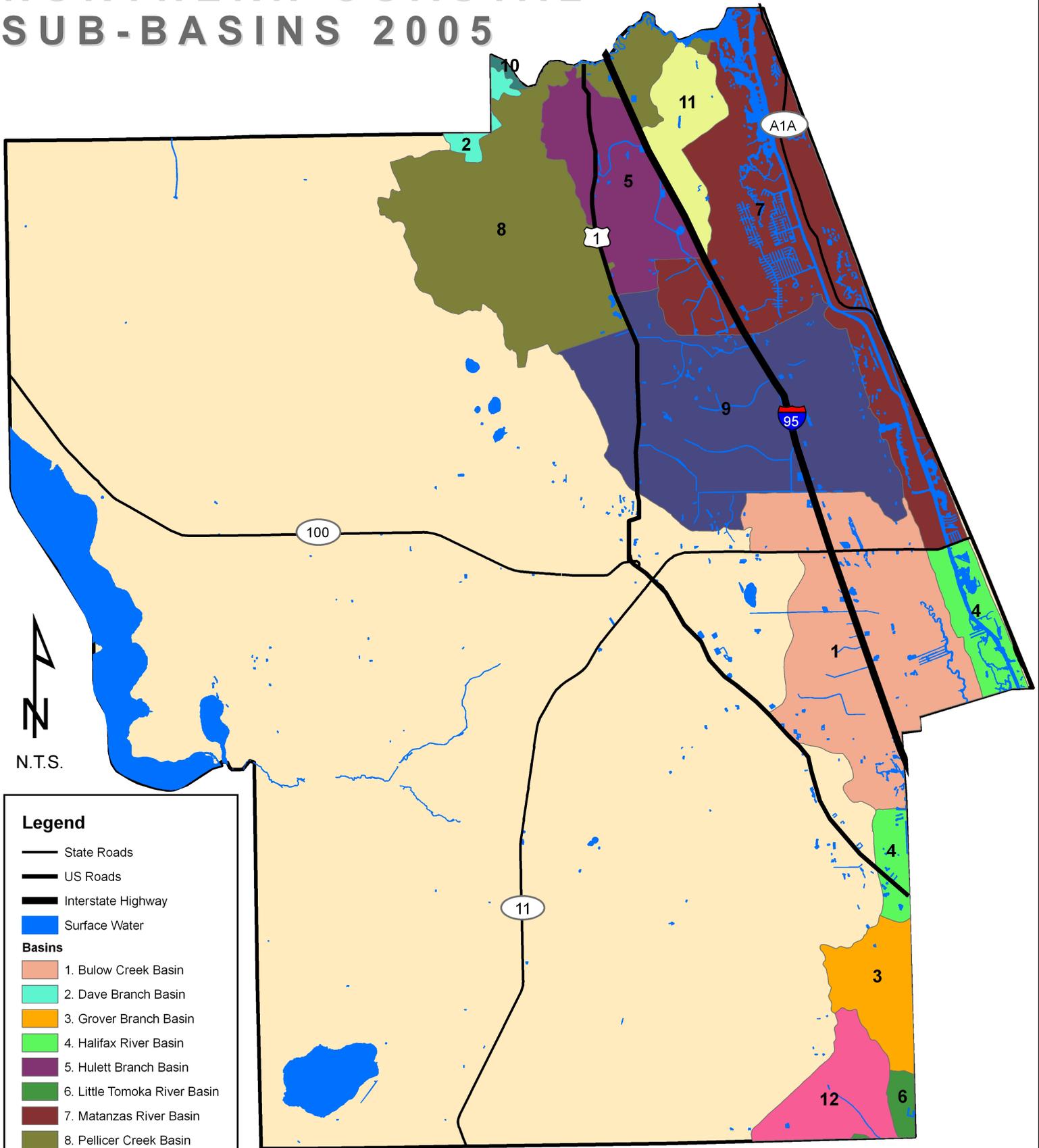
Drainage Basins

- SURFACE WATER
- BLACK POINT SWAMP
- BULL CREEK DITCHES
- BULOW CREEK
- DAVE BRANCH
- DUNNS CR, CRESCENT LK
- ESPANOLA DRAIN
- GROVER BRANCH
- HALIFAX RIVER
- HAW CREEK
- HULETT BRANCH
- LITTLE HAW CREEK
- LITTLE TOMOKA RIVER
- MATANZAS RIVER
- MIDDLE HAW CREEK
- MUD LAKE OUTLET
- PARKER CANAL
- PELLICER CREEK
- SALT CREEK DITCHES
- SAW GRASS BAY
- SIXTEENMILE CREEK
- ST. JOE CANAL
- STEVENS BRANCH
- STYLES CREEK
- SWEETWATER BRANCH
- TANK LAKE OUTLET
- UNNAMED BRANCH
- UNNAMED CANAL
- UNNAMED DITCHES
- UNNAMED SLOUGH
- WHITE OAK SWAMP

Regions to the West of the red line are in the Lower St. Johns River Basin.
Regions to the East of the red line are in the North Coastal Basin.

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NORTHERN COASTAL SUB-BASINS 2005



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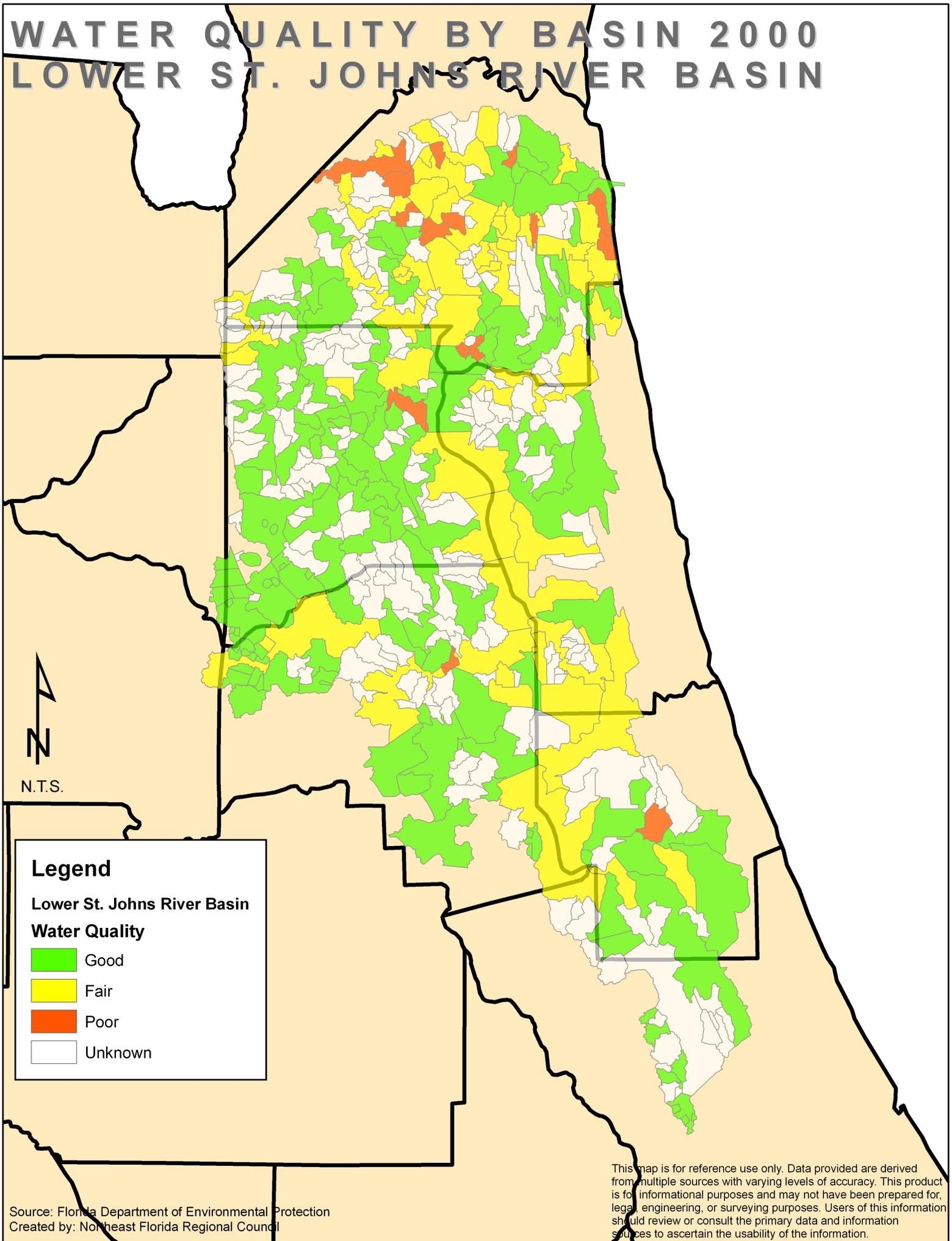
-  State Roads
-  US Roads
-  Interstate Highway
-  Surface Water

Basins

-  1. Bulow Creek Basin
-  2. Dave Branch Basin
-  3. Grover Branch Basin
-  4. Halifax River Basin
-  5. Hulett Branch Basin
-  6. Little Tomoka River Basin
-  7. Matanzas River Basin
-  8. Pellicer Creek Basin
-  9. St. Joe Canal Basin
-  10. Stevens Branch Basin
-  11. Styles Creek Basin
-  12. Unnamed Ditches Basin

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WATER QUALITY BY BASIN 2000 LOWER ST. JOHNS RIVER BASIN



N.T.S.

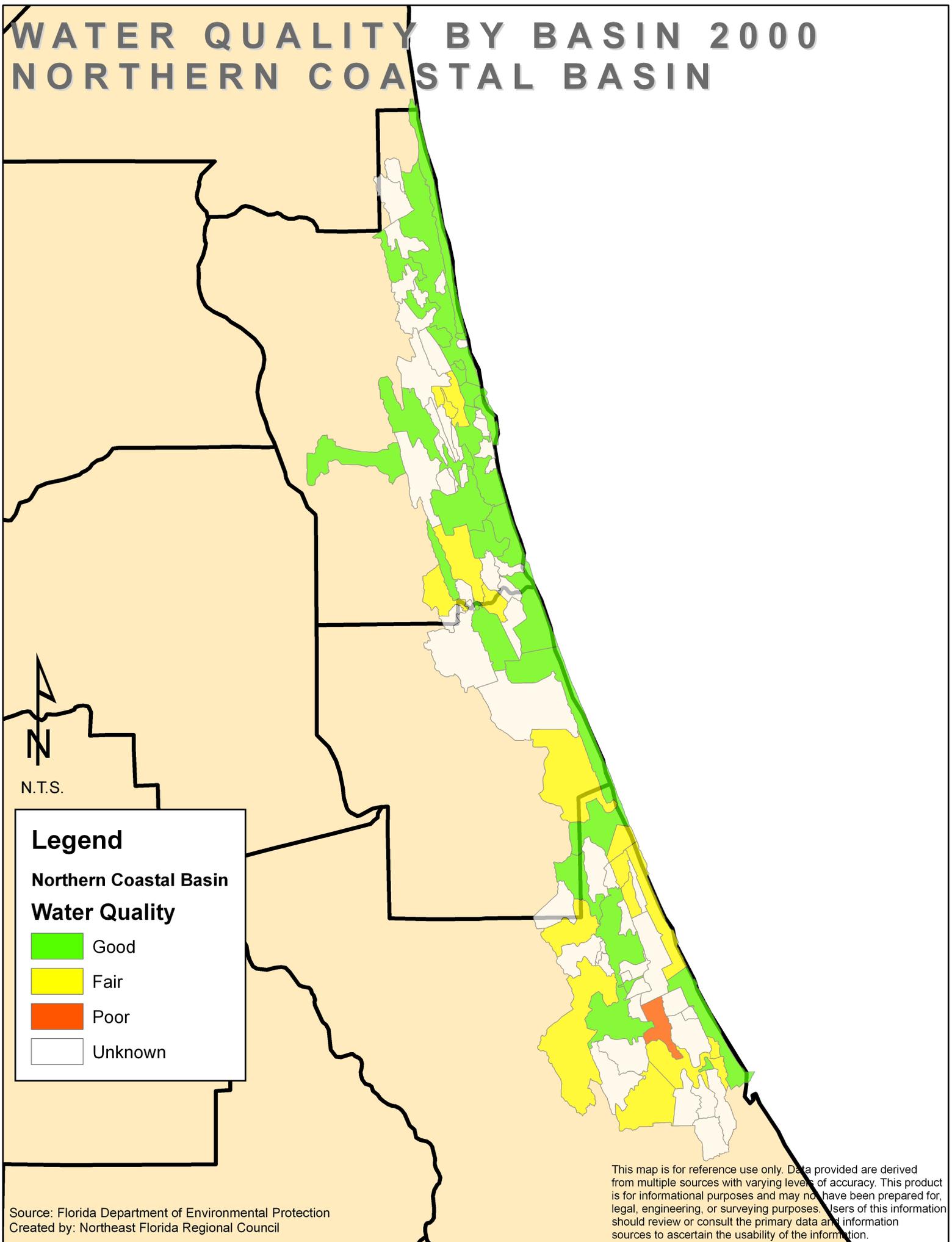
Legend

Lower St. Johns River Basin
Water Quality

- Good
- Fair
- Poor
- Unknown

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WATER QUALITY BY BASIN 2000 NORTHERN COASTAL BASIN



Legend
Northern Coastal Basin
Water Quality

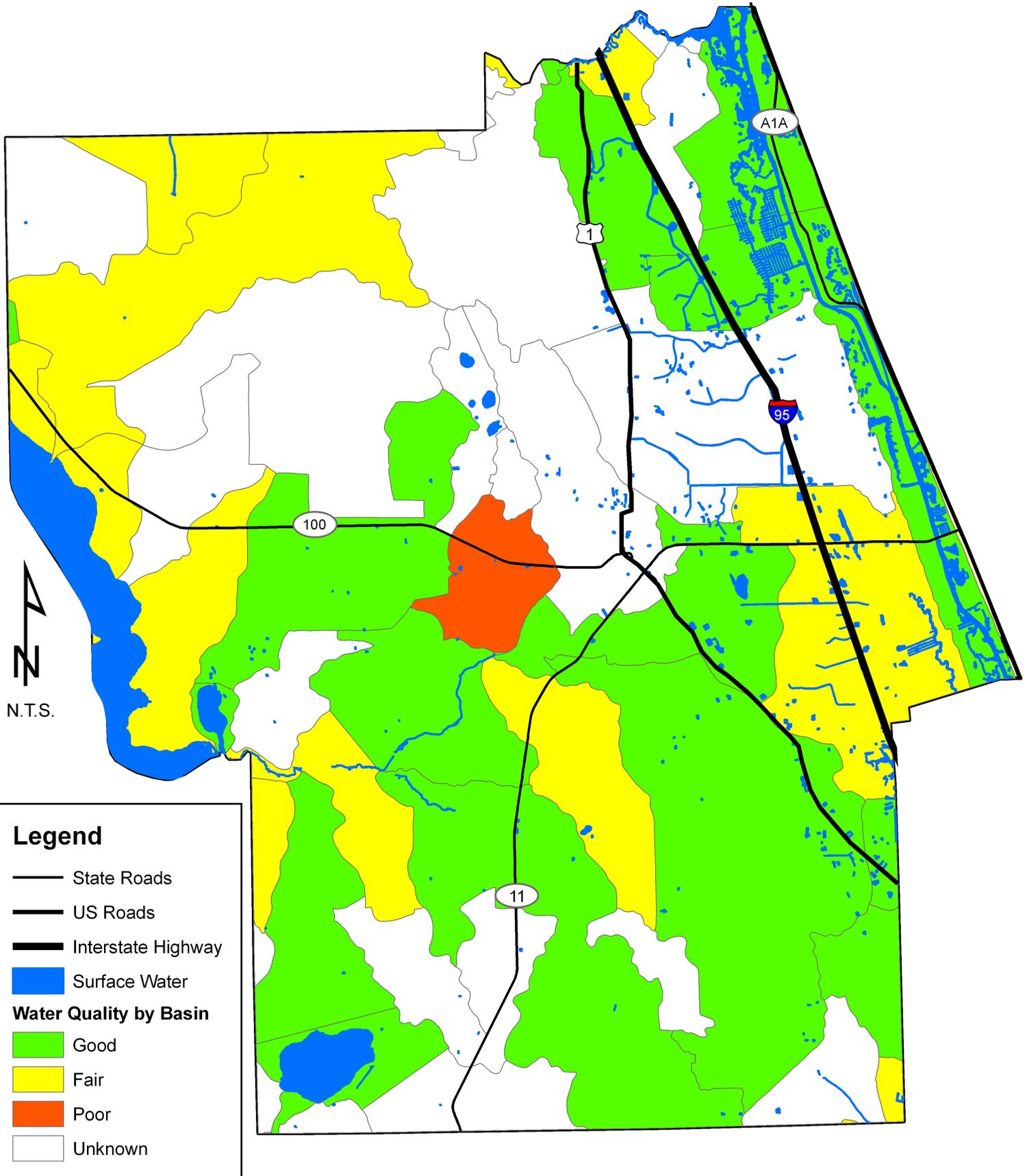
- Good
- Fair
- Poor
- Unknown

Source: Florida Department of Environmental Protection
Created by: Northeast Florida Regional Council

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WATER QUALITY BY BASIN FLAGLER COUNTY 2000

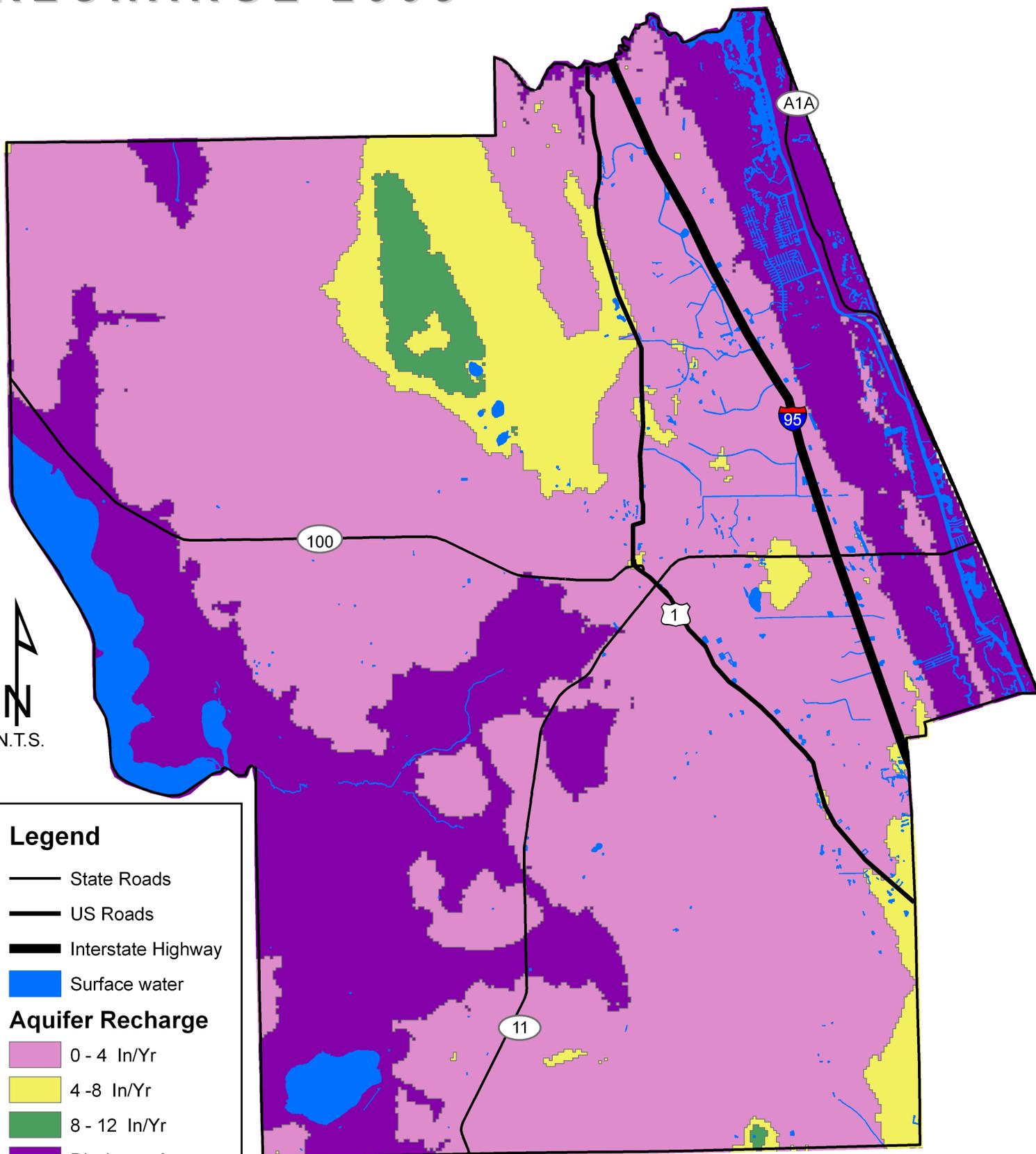


Legend

- State Roads
- US Roads
- Interstate Highway
- Surface Water
- Water Quality by Basin**
- Good
- Fair
- Poor
- Unknown

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FLORIDAN AQUIFER PRIME RECHARGE 2005



Legend

- State Roads
- US Roads
- Interstate Highway
- Surface water

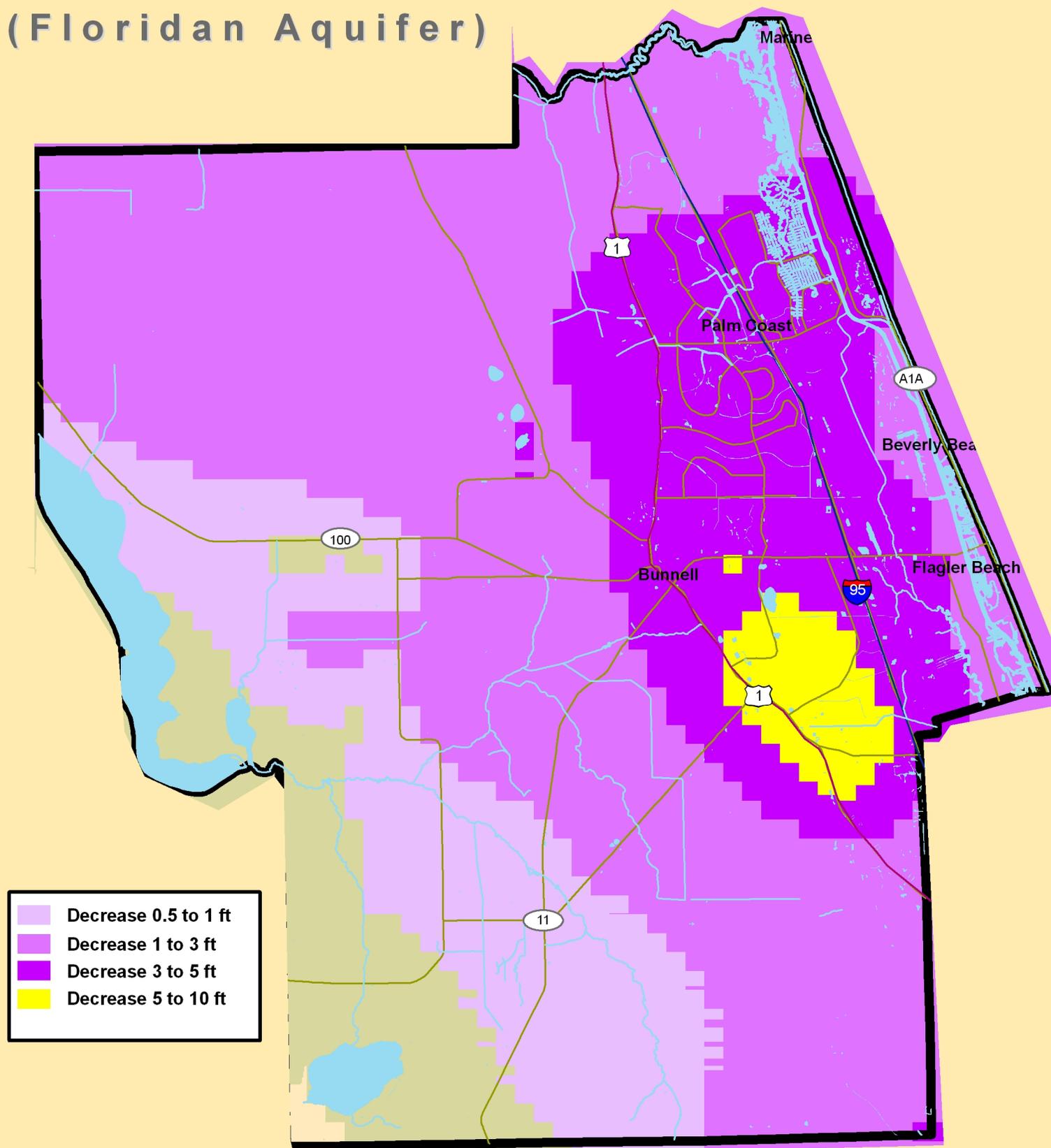
Aquifer Recharge

- 0 - 4 In/Yr
- 4 - 8 In/Yr
- 8 - 12 In/Yr
- Discharge Area

All of Flager County is located within a Priority Water Resource Caution Area

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PROJECTED POTENTIOMETRIC CHANGES IN ELEVATION (Floridan Aquifer)



Source: SJRWMD projected increase in groundwater withdrawals, 1995 - 2030
Created by: Northeast Florida Regional Council

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APPENDIX

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FLAGLER COUNTY WATER SUPPLY FACILITIES WORK PLAN

October, 2010
Revised July, 2011



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Planners
Landscape Architects
Surveyors
Construction Management
Design/Build
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CPH Engineers, Inc
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(407) 322-6841
CPH Project No. F10902

FLAGLER COUNTY
2010 - 2035 WATER SUPPLY FACILITIES WORK PLAN

INTRODUCTION

The projected water demand for 2035 is 2.571 million gallons per day (MGD), which is a 150% increase over the 2009 water demand of 1.029 MGD over the next 25 years. Flagler County doesn't own any water treatment plants and it takes water from the City of Palm Coast water supply system as a consecutive system.

The purpose of the 2010-2035 Water Supply Facilities Work Plan (WSFWP) is to identify traditional, reuse, and alternative water supply projects, as well as conservation practices necessary to serve existing and projected developments. This WSFWP is prepared for a 25-year planning period to reflect the County's long term water supply strategy and in conjunction with the Comprehensive Plan Amendment.

POPULATION AND WATER DEMAND PROJECTIONS

Table 1 shows the latest population and water demand projections from 2010 through 2035 in 5-year intervals. The population projections were based on the 2009 BEBR medium projections for the Flagler County. Since Flagler own and operates the distribution system for both the County and Beverly Beach, the projections are for both of them.

Table 1. Flagler County Population and Water Demand Projections (2010-2015)

Year	Projected Flagler County Population	Projected Beverly Beach Population	Total Population	Finished Water Demand, AADF (MGD)
2010	12,221	604	12,825	1.409
2015	14,121	610	14,731	1.618
2020	16,391	637	17,028	1.871
2025	18,601	683	19,284	2.119
2030	20,711	701	21,412	2.352
2035	22,681	718	23,399	2.571

Source: BEBR, NEFRC, Flagler County Planning Dept.

TRADITIONAL RAW WATER SUPPLY

Since Flagler County is a consecutive system of the City of Palm Coast, the County's raw water demand is through the City of Palm Coast's water supply system. Palm Coast owns and operates three (3) water treatment plants (WTPs): WTP No. 1 is classified as a lime-softening treatment plant with a permitted design capacity of 6.0 MGD; WTP No. 2 is classified as a membrane softening treatment plant with a current permitted design capacity of 6.384 MGD; and WTP No. 3 is classified as a low pressure reverse osmosis treatment plant with a permitted design capacity of 3.0 MGD.

The current raw water source supplied to the three water treatment plants is defined as the Traditional Raw Water Supply, which consists of the confined surficial aquifer water for WTP No. 1 and WTP No. 3, and the upper Floridan aquifer water for WTP No. 2. The City of

Palm Coast is currently permitted for a total of 9.51 MGD from the traditional supply. The City of Palm Coast is in the process of modifying the current Consumptive Use Permit (CUP) to increase the allocation of the Traditional Supply from 9.51 MGD to 11.023 MGD to meet the projected demands through 2015. The current CUP being modified will expire in the year of 2015.

ALTERNATIVE WATER SUPPLY

- **Reclaimed Water**

It is the County's water conservation policy to encourage all new development proposing connection to a central treatment system to adopt an approved wastewater reuse plan, particularly encouraging all potential occupants of industrial parks to adopt a reuse plan. To accomplish this, the County shall, during the development review process, refer these potential occupants either to DEP or SJRWMD depending on the ultimate use. The County similarly has made the use of reclaimed water its own standard for new County-related development as evidenced by the County's Government Services campus at 1769 East Moody Boulevard in Bunnell, which is irrigated through reclaimed stormwater collected and redistributed through an onsite system.

- **Coquina Coast Desalination Project**

City of Palm Coast along with several other municipalities is participating in the development of the Coquina Coast Seawater Desalination project to research alternative water sources other than traditional groundwater supplies. Flagler County has been very supportive of this project. The project is investigating the possibility of building a desalination plant in Northeast Florida. If the Coquina Coast Seawater Desalination project is online in 2019, the City of Pam Coast projects that it will need 4.0 MGD to 12 MGD from 2019 to 2035 from this project. As a consecutive water system, Flagler County will benefit from this project too.

- **Other Alternative Water Sources**

Crescent Lake has been previously identified as an alternative water source and may be further explored as necessary for the County's water supply.

CONSERVATION PRACTICES

The County's water conservation practices include:

- **Landscape Plants Selection**

The County encourages, through its Comprehensive Plan and adopted Land Development Code, plants that need little irrigation for landscaping such as 'Florida Friendly Native Landscape'.

- **Irrigation Time**

Flagler County follows the St. Johns River Water Management District's requirements on water conservation provision and has adopted local regulations to align with the requirements.

- **Other Water Conservation Measures**

Other water conservation measures undertaken include, but are not limited to: low water use plumbing fixtures, land spreading of treated wastewater effluent, and the dissemination of information to the public. In addition, the County may request periodic reports from the various utilities which supply water from within Flagler County updating the effectiveness of their water conservation programs.

CAPITAL IMPROVEMENT PROGRAMS

The County's activities related to the provision of potable water are dependent upon the continued wholesale, bulk-purchase of finished, potable water from the City of Palm Coast. The County doesn't have capital improvement projects on the utilities during the current planning period.

FLAGLER COUNTY WATER SUPPLY FACILITIES WORK PLAN Data and Analysis

October, 2010



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1.0 INTRODUCTION

1.1 Background

In the St. Johns River Water Management District (SJRWMD) and three other water management districts, traditional water supply sources will not be sufficient to meet demands of the growing population and the needs of the environment, agriculture and industry. In response to this water supply issue, the Florida Legislature enacted bills in 2002, 2004 and 2005 to more effectively address the state's water supply situation by improving the coordination between local land use planning and water supply planning.

The focus of the 2002 legislation was to add requirements to Chapter 163, Florida Statutes (F.S.), for local governments to prepare at least a 10-year water supply facilities work plan and to incorporate certain portions of the work plan into their comprehensive plan. This legislative change emphasized the need for local work plans to consider the applicable regional water supply plans prepared by the water management districts. The legislation strengthened the statutory linkage between the regional water supply plans prepared by the water management districts and comprehensive plans prepared by the local governments.

The purpose of this data and analysis document is to meet the statutory requirements and provide a basis for the Water Supply Facilities Work Plan and any comprehensive plan amendments of Flagler County.

1.2 Inventory of Potable Water Suppliers within the County

Flagler County purchases water from the City of Palm Coast and does not produce potable water. The majority use of water within the County is served by the City of Palm Coast as a consecutive water system. The City of Palm Coast water treatment system consists of three water treatment plants (WTPs): WTP No. 1 (PWS identification number 2180863-01) is a lime-softening plant with a permitted design capacity of 6.0 million gallons per day (MGD); WTP No. 2 (PWS identification number 2180863-02) is classified as a membrane softening plant with a permitted design capacity of 6.384 MGD; and WTP No. 3 (2180863-03) is a low pressure reverse osmosis treatment plant with a permitted design capacity of 3.0 MGD.

There are some other water providers within the County limits but these providers don't provide water to the County Utilities. These providers are:

- City of Bunnell (municipal)
- City of Flagler Beach (municipal)
- Dunes Community Development District (special district)
- Plantation Bay Utilities (private, but regulated by the PSC)
- Holiday Travel Park (private, but regulated by the FCURA – Flagler County Utility Regulatory Authority)

1.3 Stipulated Settlement Agreement

The County, together with the City of Palm Coast, the City of Flagler Beach, and a private developer entered into a Stipulated Settlement Agreement on January 31, 2007 that, among

other things, established territorial service boundaries and other regulatory conditions intended to be binding upon the parties. This Agreement, together with its implementing Order, is attached as **Appendix A**.

The underlying comprehensive plan policies in place at the time of approval of the stipulated settlement agreement supported Flagler County initiating a role as a water producer and provider of utilities. Since that time the annexation by the cities of Bunnell and Palm Coast caused the Board of County Commissioners to re-evaluate these policies. The Board of County Commissioners in 2010 adopted a 5 year strategic plan that reflected the following:

1. The County will coordinate and work with existing municipal and private utilities to ensure that the remaining areas of unincorporated Flagler County are served with a viable and sustainable source of potable water.
2. The County will continue to maintain its role as a provider of potable water distributor to the City of Beverly Beach.
3. The County will not initiate the planning and development of potable water treatment and distribution to the unincorporated areas under the following conditions:
 - There are no other utility providers that can serve the unincorporated area
 - The subject area has to be served by a centralized potable water system in order to protect valuable natural resources and/or the service will protect the public's health, safety and welfare.
 - Service to new land development projects shall only be provided when it is clear that the project is consistent with the land use goals, objectives and policies established in the Future Land Use Element
 - The proposed utility system is financially feasible and efficient in the treatment and delivery of potable water to the residents and businesses within the service area of Flagler County; and
 - The creation of the proposed utility is consistent with the Regional Water Supply Plan adopted by SJRWMD and the Flagler County Water Supply Facilities Plan has been appropriately amended.

2.0 EXISTING CONDITIONS

2.1 Water System Service Area

The Flagler County water system service area is comprised of residential, institutional, and commercial users. The County owns and operates the water distribution for the County Utilities to provide water to unincorporated Flagler County and Beverly Beach. **Figure 2.1** depicts the service area. Flagler County Utilities is a consecutive water system of the City of Palm Coast water supply system.

2.2 Definition of Water Demands

Water demands are expressed as an average day demand, maximum day demand, peak hourly demand, and fire flow demand.

Average Day Demand: The average day demand is the total water consumed during a calendar year divided by 365 days. Flow rates vary daily and seasonally. The County's historical monthly water reports were used to determine the total amount of water consumed per year and the average day demand.

Maximum Day Demand: The maximum day demand is the maximum amount of water delivered during a 24-hour period. The County staff records the maximum daily flow each month. Historical monthly water reports were used to determine the maximum day demand. The ratio of the maximum daily demand divided by the average daily demand is known as the "maximum day demand factor". The maximum average daily demand factor for the County system is 1.39 for the past seven years, which is calculated for the Palm Coast system because County is a consecutive water system of the City of Palm Coast water supply system.

Peak Hourly Demand: The peak hourly demand is the maximum flow that must be supplied to the system during the hour of greatest water use. The "peak hourly demand factor" is the ratio of the peak hour demand to the maximum day demand. Peak hour demand rates are not normally recorded. A "peak hourly demand factor" of 1.5 is usually used for design.

Fire Flow: Fire flow is the flow rate of water required to fight a major fire. The required fire flow capacity depends on many factors such as population, type of facility being protected, type of construction, value of improvements, and the level of protection desired. The City of Palm Coast requires that a 1,500 gallon per minute (gpm) fire flow for a four hour period be provided by the water system.

2.3 Historic Population and Water Demands

Table 2.1 illustrates the historic population and water flows for unincorporated Flagler County and Beverly Beach which is served by Flagler County over the past seven years. The average annual average daily flow (AADF) is 1.109 MGD. The average max day flow (MDF) is 1.416 MGD. The peaking factor MDF/AADF is 1.390. The average per capital usage is 110 gal/day over the past seven years. These numbers are used to project the future water demand for Flagler County.

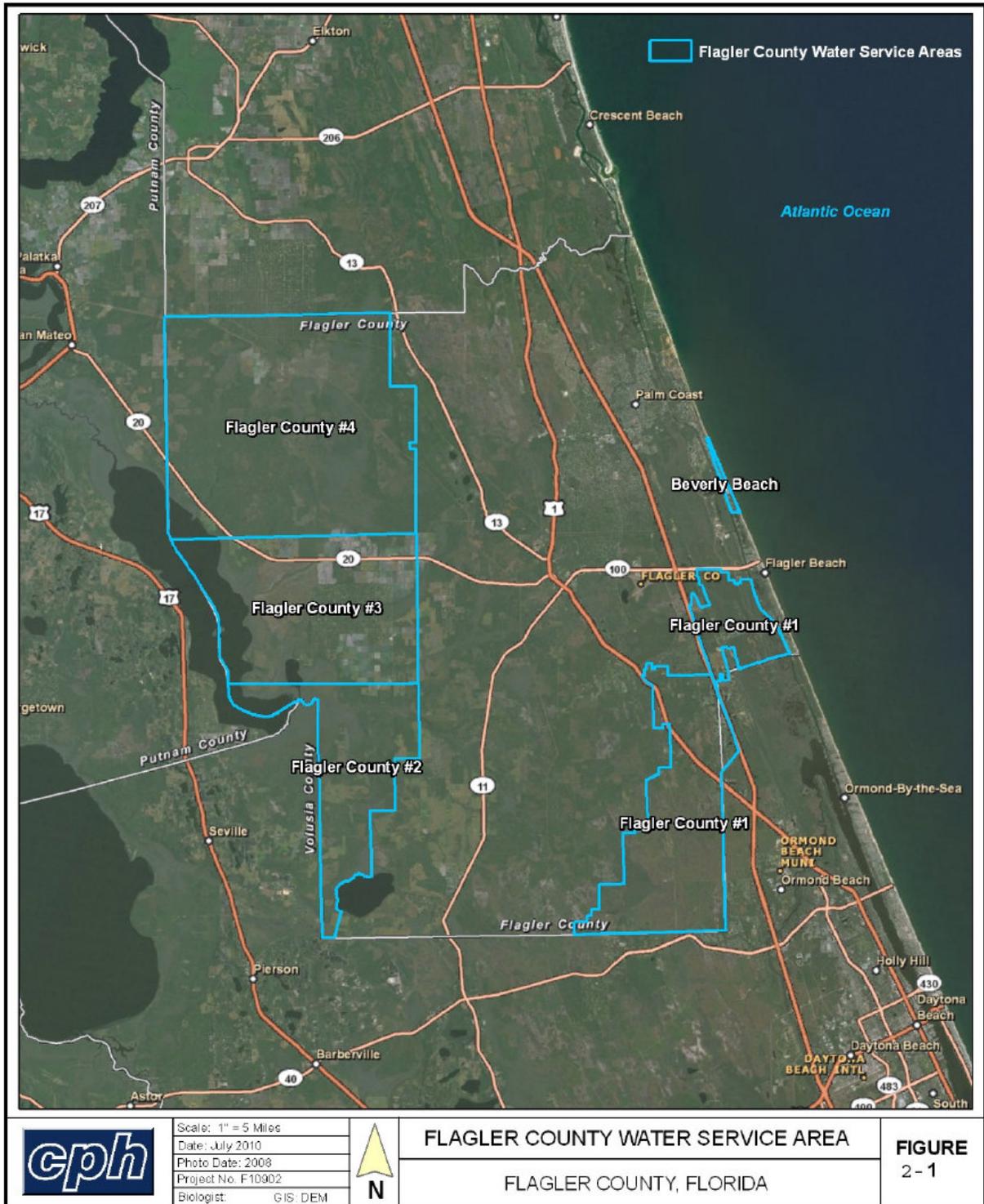


Figure 2.1. Flagler County Water Service Area Map

Table 2.1. Historical Finished Water Demands.

Year	Population	ERU	Annual Avg. Day Flow (MGD)	AADF per Capital Usage (MGD/Capital)	Annual Max Day Flow(MGD)	MDF/AADF (Peaking Factor)
2003	6,903	2,876	0.880	128	1.163	1.32
2004	8,085	3,369	0.990	122	1.527	1.54
2005	9,350	3,896	1.031	110	1.327	1.29
2006	10,560	4,400	1.220	116	1.657	1.36
2007	10,920	4,550	1.167	107	1.602	1.37
2008	11,188	4,662	1.078	96	1.521	1.41
2009	11,449	4,770	1.029	90	1.479	1.44
Average			1.057	110	1.468	1.390

2.4 Water Sources

Flagler County does not have its own raw water sources for public water supply since it is a consecutive system of the City of Palm Coast's water supply system. The City of Palm Coast pumps ground water from the confined surficial aquifer and upper Floridan aquifer as the raw water supply. The St. Johns River Water Management District (SJRWMD) issued the City of Palm Coast's consumptive use permit (CUP No. 1947) on December 13, 2005. Due to increased demand, the City submitted the application to modify the permit to increase the permitted withdrawal and modify well locations for WTP No. 3. The SJRWMD issued the new permit on March 30, 2009 with new well locations as requested, but the permitted withdrawal remained unchanged. The current permit expires on December 13, 2015. The permitted total withdrawal from the two aquifers is presented in **Table 2.2**. The City has submitted a new CUP modification application to request increase the allocation from 9.51 MGD to 11.023 MGD to meet the projected demands through 2015.

Table 2.2. Palm Coast CUP Allowable Groundwater Withdrawal.

	Confined Surficial Aquifer, MGD	Floridan Aquifer, MGD	Total, MGD
2005	3.50	4.37	7.87
2006	3.50	4.85	8.35
2007	4.19	4.05	8.24
2008	4.60	4.05	8.65
2009	5.05	4.05	9.10
2010-2015	5.46	4.05	9.51

Note: * The listed allocations are the permitted withdrawal without Dunes Community Development District.

2.5 Existing Distribution System

The County's distribution system consists of the former Ocean City Utilities System within the incorporated limits of the Town of Beverly Beach. The County maintains no other distribution systems and no additional systems are planned at this time.

3.0 FUTURE CONDITIONS

4.1 Population and Water Demand Projections

The projected populations for unincorporated Flagler County and Beverly Beach were provided by the Bureau of Economic and Business Research (BEBR). The projected population and water demand values are tabulated in **Table 3.1**. The maximum day flow was determined by using a peaking factor of 1.39 as calculated by the average of the past seven years (**Table 2.1**). **Table 3.1** indicates that the finished water demand for the twenty-five year planning period will increase from 1.342 MGD to 2.491 MGD from 2010 to 2035.

Table 3.1. Projected Populations and Finished Water Demands, 2010-2035.

Year	Projected Unincorporated Flagler County Population	Projected Beverly Beach Population	Total Population	Per Capita Usage (gal/day)	Finished Water Demand, AADF (MGD)	Finished Water Demand, MDF (MGD)
2010	12,221	604	12,825	110	1.409	1.958
2011	12,601	604	13,205	110	1.451	2.016
2012	12,981	604	13,585	110	1.492	2.074
2013	13,361	604	13,965	110	1.534	2.132
2014	13,741	604	14,345	110	1.576	2.190
2015	14,121	604	14,725	110	1.617	2.248
2016	14,575	604	15,179	110	1.667	2.318
2017	15,029	604	15,633	110	1.717	2.387
2018	15,483	604	16,087	110	1.767	2.456
2019	15,937	604	16,541	110	1.817	2.526
2020	16,391	604	16,995	110	1.867	2.595
2021	16,833	604	17,437	110	1.915	2.662
2022	17,275	604	17,879	110	1.964	2.730
2023	17,717	604	18,321	110	2.012	2.797
2024	18,159	604	18,763	110	2.061	2.865
2025	18,601	604	19,205	110	2.110	2.932
2026	19,023	604	19,627	110	2.156	2.997
2027	19,445	604	20,049	110	2.202	3.061
2028	19,867	604	20,471	110	2.249	3.126
2029	20,289	604	20,893	110	2.295	3.190
2030	20,711	604	21,315	110	2.341	3.255
2031	21,105	604	21,709	110	2.385	3.315
2032	21,499	604	22,103	110	2.428	3.375
2033	21,893	604	22,497	110	2.471	3.435
2034	22,287	604	22,891	110	2.514	3.495
2035	22,681	604	23,285	110	2.558	3.555

Note: Portions of the unincorporated County are served by Volusia County (in the area of Old Kings Road South, located North of Halifax Plantation) and the City of Ormond Beach (for the Hunter's Ridge DRI). Excerpts from each jurisdiction's respective Water Supply Facilities Work Plan are included at Appendix B. These documents demonstrate that adequate capacity exists over the planning period to accommodate anticipated projected demand. Alternative water source information is also included as applicable.

4.2 Distribution System Requirements during Planning Period

No improvements to the County's distribution system are anticipated during the planning period other than routine maintenance to the distribution system.

4.0 WATER SUPPLY SYSTEM IMPROVEMENTS

No water supply system improvements are anticipated during the planning period other than routine maintenance to the Beverly Beach distribution system.

5.0 ALTERNATIVE WATER SUPPLY SOURCES

The authorized groundwater withdrawals in the future are assumed to be limited. The County as a responsible government official, is actively participating in alternative water supply sources developments, such as reclaimed water and surface water.

5.1 Reclaimed Water

It is the County's water conservation policy that in order to encourage all potential occupants of industrial parks to have an approved wastewater reuse plan, the County shall, during the development review process, refer these potential occupants either to DEP or SJRWMD depending on the ultimate use. Currently, the County's facility at 1769 East Moody Boulevard in Bunnell is irrigated through reclaimed stormwater collected and redistributed through an onsite system.

5.2 Coquina Coast Desalination Project

The SJRWMD 2005 Drinking Water Supply Plan previously identified the St. Johns River near Lake George and several other surface water bodies in Putnam, Marion, and Flagler counties as the potential alternative water supply sources for the City of Palm Coast and five other entities. ARCADIS G&M, Inc. was contracted by the SJRWMD to work with the Flagler County Water Supply Plan Cooperators to evaluate the feasibility of utilizing these surface water bodies as alternative water sources. In 2007, ARCADIS concluded that utilizing any surface water bodies in Putnam and Marion County is not politically or technically feasible, and recommended that seawater along the coast of the Flagler or St. John's County be considered as viable alternative water supply.

City of Palm Coast along with several other municipalities is participating in the development of the Coquina Coast Seawater Desalination project to research alternative water sources other than groundwater. Flagler County has been very supportive on this project. The project is investigating the possibility of building a desalination plant in Northeast Florida. If the Coquina Coast Seawater Desalination project is online in 2019, the City of Pam Coast estimates that it will need 4.0 MGD to 12 MGD from 2009 to 2035 from this project. As a consecutive water system, Flagler County will benefit from this project too.

5.3 Other Alternative Water Sources

Crescent Lake has been previously identified as an alternative water source and may be further explored as necessary for the County's water supply.

6.0 WATER CONSERVATION PLAN

Flagler County supports ongoing water conservation practices in the effort to save potable water. This Section discusses the County's water conservation measures.

6.1 Landscape Plants Selection

The County encourages plants that need little irrigation for landscaping such as 'Florida Friendly Native Landscape'. Florida Friendly Native Landscape incorporates lush greenery that matches appropriate plants with existing site conditions to minimize watering. Florida Friendly Native Landscape includes choosing plants that thrive in conditions where they are best suited, whether in sun, shade or near salt and fresh water. The proper plant placed in the proper location will grow substantially with self-sufficiency, needing little water to survive.

Florida Friendly Native Landscape also includes planting grass only where it is functional, mulching plants to hold moisture and placing moisture-loving plants in wet areas. Efficient irrigation is emphasized, only when plants need water or when rain is inadequate, with irrigation systems designed or modified to irrigate St. Augustine lawns on a separate zone from shrubbery zones, which typically require less water than this type of grass.

6.2 Irrigation Time

Flagler County follows the St. Johns River Water Management District's requirements on water conservation provision and has adopted local regulations to align with the requirements:

- **During Daylight Savings Time (March through November):**

Watering is limited to no more than two days per week and not between 10:00am and 4:00pm as scheduled below.

- Odd numbered addresses water on Wednesday and Saturday
- Even numbered addresses water on Thursdays and Sundays
- Non-residential properties water on Tuesdays and Fridays
- Irrigation is limited to no more than $\frac{3}{4}$ inches of water per zone per irrigation day and no more than one hour per irrigation zone per day.
- Automatic irrigation systems are required by State law to have a rain sensor device that shuts off the system when adequate rainfall has occurred.

- **During Eastern Standard Time (November through March):**

- Odd numbered addresses water only on Saturdays
- Even numbered addresses water only on Sundays
- Non-residential properties irrigate on Tuesdays

6.3 Other Water Conservation Measures

Other water conservation measures undertaken include, but are not limited to: low water use plumbing fixtures, xeriscape landscape techniques, land spreading of treated wastewater effluent, and the dissemination of information to the public.

In addition, the County may request periodic reports from the various utilities which supply water from within Flagler County updating the effectiveness of their water conservation programs.

7.0 CAPITAL IMPROVEMENT PROJECTS

The County's activities related to provision of potable water are dependent upon the continued wholesale, bulk-purchase of finished, potable water from the City of Palm Coast. The County doesn't have capital improvement projects on the utilities during the planning period.

Appendix A Water Supply Settlement Agreements

IN THE CIRCUIT COURT OF THE SEVENTH JUDICIAL CIRCUIT IN AND
FOR FLAGLER COUNTY, FLORIDA

CITY OF FLAGLER BEACH,
a municipal corporation of the
State of Florida, and
CITY OF PALM COAST, a municipal
corporation of the State of Florida

Plaintiff,

CASE NO.: 06-001531CA

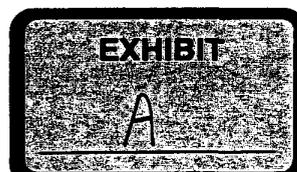
v.

HAMMOCK BEACH RIVER CLUB PROPERTY
OWNERS' ASSOCIATION, INC., n/k/a
THE GARDENS AT HAMMOCK BEACH
PROPERTY OWNERS' ASSOCIATION, INC.,
a Florida Non-Profit Corporation, and
FLAGLER COUNTY, a Political subdivision
of the State of Florida

Defendants.

SETTLEMENT AGREEMENT

This Stipulated Settlement Agreement ("Agreement") is made and entered into this 31 day of January, 2007 by and among CITY OF FLAGLER BEACH, a municipal corporation of the State of Florida ("FLAGLER BEACH"), FLAGLER COUNTY, a political subdivision of the State of Florida ("COUNTY"), THE GARDENS AT HAMMOCK BEACH PROPERTY OWNERS' ASSOCIATION, INC., a Florida not-for-profit corporation, f/k/a Hammock Beach River Club Property Owners' Association, Inc. ("POA"), and the CITY OF PALM COAST, a municipal corporation of the State of Florida ("PALM COAST"). FLAGLER BEACH, COUNTY, POA, and PALM COAST shall hereafter collectively be referred to as the "Parties."



RECITALS

1. The Parties have raised disputes over who should provide water and wastewater service in portions of Flagler County, Florida.
2. PALM COAST, COUNTY, and FLAGLER BEACH initiated proceedings under Chapter 164, *Florida Statutes*, and met throughout 2006 to resolve their disputes.
3. FLAGLER BEACH and PALM COAST have entered a series of four interlocal agreements in March, July and August of 2006 regarding water and wastewater service areas (the "Initial Agreements").
4. The COUNTY and POA entered into a Utility Asset Transfer Agreement approved August 21, 2006, and executed on September 26, 2006, regarding the provision of water, wastewater, and reclaimed water service to property described in Composite Exhibit "A" to that agreement (the "Utility Asset Transfer Agreement").
5. FLAGLER BEACH filed a complaint against COUNTY and POA on or about August 30, 2006, in the above captioned action (the "Action"), in which PALM COAST was granted subordinate intervenor status on October 5, 2006.
6. FLAGLER BEACH filed a Notice of Voluntary Dismissal without prejudice of its Action against COUNTY on December 14, 2006.
7. The Parties mediated this dispute on December 22, 2006, and have reduced to writing their agreement in this document.
8. The governmental signatories to this Agreement wish to create a mutually binding agreement which cannot be abrogated during its term by future commissions, councils, or boards.
9. The Parties have consented to the rejoinder of the COUNTY into the Action as a party-Defendant and for PALM COAST to be granted full party status in the litigation as a party-Plaintiff for the purposes of settling said Action with this mutually binding agreement.
10. All Parties now wish to resolve the Action.

UNOFFICIAL DOCUMENT

ACCORDINGLY, in consideration of the above-stated Recitals, the covenants set forth in this Agreement and other good and valuable consideration, the receipt and sufficiency of which are acknowledged by the Parties hereto, the Parties agree as follows:

TERMS

SECTION 1. RECITALS. The above Recitals are true and correct and are hereby incorporated in this Agreement as a material part thereof.

SECTION 2. SUBMISSION OF ORDER. The Parties to this proceeding will submit to the Court a joint motion and agreed Order approving this Agreement, a copy of which joint motion and agreed Order are attached to this Agreement as a material part, upon its full execution by the Parties.

SECTION 3. INCORPORATION OF EXHIBIT "A," UTILITIES TERRITORIAL SERVICE AREA BOUNDARY MAP. The Parties agree to and do hereby incorporate, as a material part, into this Agreement **Exhibit "A"** (two maps hereafter collectively "Map"). The Map shall be referred to and explained as set forth in this Agreement.

SECTION 4. AGREEMENTS AMONG FLAGLER BEACH, COUNTY, PALM COAST AND POA.

4.1. Service Area Agreement.

(1) The Parties agree to the retail water and wastewater service areas as depicted on the Map, and shall not offer to serve or serve within the service area of another Party without the express written consent of the other Party. The COUNTY shall be the retail water and wastewater provider along the John Anderson Highway corridor north and east of Bulow Creek and south of State Road 100 as depicted on the Map ("John Anderson Corridor"). FLAGLER BEACH shall provide reclaimed water directly to the POA for use on the project known as the Gardens at Hammock Beach Planned Unit Development ("PUD") the property description of which is set forth in **Exhibit "B"** (the "PUD Property") as further set forth below.

(2) FLAGLER BEACH shall provide to the COUNTY sufficient wholesale water and wastewater service capacity for the COUNTY to provide retail water and wastewater service to the PUD Property, and also to provide retail water and wastewater service to the John Anderson Corridor utilizing said wholesale capacity. FLAGLER BEACH shall provide up to 216,250 gallons per day, annual average daily flow ("GPDADF") of water service capacity and 173,000 GPDADF of wastewater service capacity to the COUNTY ("Wholesale Capacity"), of which 178,750 GPDADF of water service capacity and 143,000 GPDADF of wastewater capacity shall be expressly reserved for use on the PUD Property ("PUD Reserved Capacity"). In the event that additional water service capacity or wastewater capacity in excess of the PUD Reserved Capacity is required for the build-out development of the PUD Property, the COUNTY shall make such capacity available for the PUD Property to the extent available from the Wholesale Capacity. If the COUNTY has no such capacity available at the time of the request, then FLAGLER BEACH shall make such capacity available to the COUNTY for the PUD Property to the extent available at the time of the request. In the event that the COUNTY requires additional water service capacity or wastewater capacity for the John Anderson Corridor in excess of the Wholesale Capacity available to the COUNTY, then FLAGLER BEACH shall make such capacity available to the COUNTY to the extent available at the time of the request. If FLAGLER BEACH has no capacity available at the time of a request for additional capacity for either the PUD Property or the John Anderson Corridor, FLAGLER BEACH, the POA and the COUNTY will cooperate to timely expand capacity to the extent financially feasible and permit-able. Additional water service capacity and wastewater capacity that may be made available by

FLAGLER BEACH to the COUNTY as set forth above shall be added to the definition of Wholesale Capacity. The PUD Reserved Capacity and any other capacity reserved for the PUD Property in the future may not be used by the County without the prior written consent of the POA.

(3) The County and the POA shall not build water or wastewater treatment plants to serve the John Anderson Corridor, provided, however, if FLAGLER BEACH is unwilling or unable to timely expand capacity for COUNTY needs in the John Anderson Corridor (including the PUD Property), COUNTY may build or expand plants to serve said area. The POA shall design, permit, and construct a wastewater line to be metered at FLAGLER BEACH's wastewater plant and a metered water line along John Anderson Highway to connect FLAGLER BEACH facilities to the PUD Property and to loop the water system, as more fully described on Exhibit "C" to this Agreement, incorporated as a material part of this Agreement.

4.2. Rates and Charges.

(1) FLAGLER BEACH agrees that the wholesale water and wastewater rates to be charged COUNTY ("Wholesale Rates") will be equal to the base facility charge per equivalent residential connection ("ERC") and gallonage rates charged by FLAGLER BEACH to its retail water and wastewater customers inside the FLAGLER BEACH city limits based upon and calculated by the number of ERCs connected to the COUNTY'S retail system in the John Anderson Corridor, with no out-of-city surcharge added thereto as a material part of the consideration for the COUNTY and POA settling the Action and entering into this Agreement. A further explanation of the rate calculation is set forth in Exhibit "D." Such FLAGLER BEACH in-city retail base facility charges and

gallage rates may be changed from time to time provided FLAGLER BEACH agrees to provide COUNTY and POA sixty (60) days advance written notice prior to applying any such increases to the COUNTY Wholesale Rates. The COUNTY agrees that the retail rates charged by the COUNTY to customers within the PUD Property shall be consistent with Section 5.06(b) of the Utility Asset Transfer Agreement (which Utility Asset Transfer Agreement is otherwise terminated pursuant to the provisions of Section 4.3(1) below). FLAGLER BEACH agrees that the COUNTY retail customers within the PUD Property shall have standing to participate in any change in the Wholesale Rates as if they were direct retail customers of FLAGLER BEACH.

(2) FLAGLER BEACH agrees that the water and wastewater capacity / capital charges / impact fees ("Impact Fees") as set forth in FLAGLER BEACH rate ordinances for in-city customers ("Rate Ordinance") shall be applicable, without surcharge, to the COUNTY for the Wholesale Capacity serving the PUD Property. FLAGLER BEACH agrees that the POA shall, on behalf of the COUNTY, pay or be responsible to FLAGLER BEACH directly for payment of Impact Fees related to the PUD Property, which Impact Fees shall be paid directly from the POA to FLAGLER BEACH. Impact Fees shall be based upon an annual average flow on a per ERC basis, with an ERC defined as 250 GPDADF for water and 200 GPDADF for wastewater. Payment of said Impact Fees by the POA for the PUD Property shall be offset by the POA credits as set forth below. The Impact Fees set forth in the Rate Ordinance, as amended from time to time, shall also apply to any additional water and wastewater capacity requested by the COUNTY or the PUD Property owners from time to time, provided any such additional capacity shall require a further agreement among

the COUNTY, FLAGLER BEACH and the PUD Property owners (as applicable). The capacity in excess of the PUD Property owner's use made available by FLAGLER BEACH shall be acquired by FLAGLER COUNTY as needed for units within the John Anderson Highway Corridor.

4.3. Regulatory Matters.

(1) COUNTY and POA agree that all developer orders as defined in Section 380.04, *Florida Statutes*, are hereby amended to delete the requirement for POA to convey a utility site and build a water plant and wastewater plant. Water and wastewater pipelines in the PUD Property shall be designed, permitted, constructed, and conveyed to the COUNTY pursuant to Article 5 of the Utility Asset Transfer Agreement, which Utility Asset Transfer Agreement is otherwise hereby terminated.

(2) FLAGLER BEACH, COUNTY, PALM COAST and POA shall support modifying FLAGLER BEACH's water use permit issued by the St. Johns River Water Management District ("SJRWMD") to increase permitted water allocation for the water Wholesale Capacity. This Agreement is subject to such modification of FLAGLER BEACH's water use permit by SJRWMD.

(3) FLAGLER BEACH, COUNTY, PALM COAST and POA shall support modifying the POA's water use permit application in review by the SJRWMD to remove the potable water demand while maintaining interim water for golf construction with long-term back-up well withdrawals in case reclaimed water is unavailable from time to time due to maintenance or other momentary lapses in service. This Agreement is subject to approval of such POA water use permit by SJRWMD.

(4) FLAGLER BEACH, PALM COAST and COUNTY shall execute proper Florida Department of Environmental Protection ("FDEP") permit applications for the PUD Property consistent with this Agreement. This Agreement is subject to approval and issuance of FDEP permits or permit modifications for construction and operation of the reclaimed water facility and concentrate disposal as provided in Section 4.4 below.

(5) In the event necessary permits required above are not issued in a timely manner, then the affected Parties shall have the right to take any reasonable actions to effectuate the provision of utility service as needed.

4.4. Irrigation / Reclaimed Water Issues.

(1) The POA shall design, permit, and construct a reclaimed water treatment facility capable of producing 1.0 million GPDADF of reclaimed water ("Reclaimed Water Capacity") meeting FDEP requirements under Chapter 62.610 F.A.C. ("Reclaimed Facility"), at its expense, to be located on the FLAGLER BEACH wastewater treatment plant site, to be conveyed at completion to FLAGLER BEACH. The Reclaimed Facility shall be constructed as a condition of delivery of the Wholesale Capacity by FLAGLER BEACH, subject to the provisions of Section 4.5(2) below. The Reclaimed Facility design capacity is subject to further coordination among FLAGLER BEACH, the POA and FDEP and shall depend, in part, on the level of mixing of FLAGLER BEACH treated effluent allowed by the FDEP for irrigation, and on the approval of FDEP and USEPA on the surface water discharge of the confluence of FLAGLER BEACH effluent and Reclaimed Facility byproduct effluent.

(2) FLAGLER BEACH agrees to an Impact Fee credit in favor of the POA equal to 865 ERCs of water service capacity and 865 ERCs of

wastewater service capacity against Impact Fees that would otherwise be charged by FLAGLER BEACH to the POA for the Wholesale Capacity, to be credited upon conveyance of the Reclaimed Facility to FLAGLER BEACH (pro rata Impact Fee credit shall be reasonably granted by FLAGLER BEACH during construction of the Reclaimed Facility if requested by the POA based upon verified interim project cost payments by the POA). The POA may assign excess Impact Fee Credits to the COUNTY and to PUD Property owners. In addition, the POA shall be entitled to utilize Impact Fee Credits from FLAGLER BEACH on property that may be developed by the POA Parties within the John Anderson Corridor ("Future Development"), provided, the cumulative Impact Fee Credits for the Wholesale Capacity shall not exceed the cost of the Reclaimed Water Capacity constructed by the POA.

(3) POA agrees to accept, and FLAGLER BEACH agrees to deliver the Reclaimed Water Capacity, based on a cost recovery charge of twenty five cents (\$0.25) per thousand gallons ("Cost Recovery Charge"). Such Cost Recovery Charge may be adjusted from time to time for cost reductions or increases in chemicals, electricity and direct labor, provided that FLAGLER BEACH provides the POA sixty (60) days notice of any such proposed change. FLAGLER BEACH agrees to provide to POA all Reclaimed Water Capacity meeting FDEP requirements, subject to POA need for irrigation uses. Should FLAGLER BEACH have insufficient Reclaimed Water Capacity available from time to time due to treatment plant maintenance, service interruptions or non-specification reclaimed water to serve all the PUD Property, the POA shall have the right to provide backup irrigation quality water to the PUD Property from other permitted sources. POA or a community development district may be the

recipient of the Reclaimed Water Capacity. Should FLAGLER BEACH have more reclaimed water than the POA can accept for irrigation purposes on the PUD Property from time to time, FLAGLER BEACH shall reuse or dispose of such excess reclaimed water elsewhere.

4.5. Miscellaneous Agreements.

(1) FLAGLER BEACH, POA, PALM COAST and COUNTY agree to and incorporate the Map into this Agreement. This Agreement shall survive any future annexations that may occur of all or any part of the PUD Property, and this Agreement shall not be used as a basis for supporting annexation of all or any portion of the PUD Property.

(2) FLAGLER BEACH represents and warrants to the POA that it has or will have the capacity and infrastructure available to provide all of the Wholesale Capacity on or before January 1, 2008, subject to the terms of this Agreement, and such Wholesale Capacity shall be provided at an adequate pressure to meet current and future fire flow requirements for the PUD Property. Notwithstanding the foregoing and for purposes of PUD Property construction utility demands, development models, initial landscaping and pre-opening facility needs, FLAGLER BEACH agrees to provide thirty (30) ERCs of the Wholesale Capacity for the PUD Property from FLAGLER BEACH's water and wastewater utility system (collectively "Construction ERCs") upon the payment by the POA to FLAGLER BEACH of Impact Fees for such capacity, which Impact Fees shall be refunded by FLAGLER BEACH to the POA upon the POA's completion and conveyance of the Reclaimed Water Facility to FLAGLER BEACH. The POA acknowledges that delivery of the Construction ERCs by FLAGLER BEACH shall

be subject to the POA's completion of the required interconnection facilities as provided in Section 4.1(3) above.

(3) FLAGLER BEACH further represents and warrants to the POA that except for the payment of Impact Fees by the POA and payment of the cost of the Reclaimed Water Capacity as set forth above, FLAGLER BEACH shall not charge the POA or customers within the PUD Property any additional fees or charges related to the reservation or provision of Wholesale Capacity and Reclaimed Water Capacity (exclusive of any rates, fees and charges related to Wholesale Capacity to the County as provided above).

(4) The COUNTY represents and warrants to the POA that the COUNTY shall not charge the POA any Impact Fees or other fees or charges related to the reservation or provision of Wholesale Capacity and Reclaimed Water Capacity (exclusive of equal rates, fees and charges related to retail service to customers).

4.6. Beverly Beach Interconnect. FLAGLER BEACH agrees to provide COUNTY with up to 20,000 GPDADP of wholesale water service capacity through the Beverly Beach interconnect within 180 days of approval of this Agreement, at a time mutually agreed upon with the County. Delivery of this capacity shall be subject to payment of impact fees and rates as set forth in Exhibit "D" hereof.

SECTION 5. AGREEMENTS BETWEEN PALM COAST AND COUNTY.

PALM COAST and COUNTY agree as follows:

5.1. Service Area Agreements. PALM COAST and COUNTY agree to the retail water, wastewater, and reclaimed water service areas as depicted on the Map, and shall not offer to serve or serve within the service area

of another without the express written consent of the other. PALM COAST may serve within its current and future City Limits; provided, however, it may not serve within COUNTY's service area as depicted on the Map, subject, however, to the provisions of Section 5.3 of this Agreement. PALM COAST and the COUNTY may enter into subsequent agreements in order to provide efficient and cost effective utility service to the public.

5.2. Wholesale Water Supply and Extension of Water Line.

PALM COAST agrees to make available to COUNTY water and/or wastewater service on a wholesale basis subject to but not in excess of wholesale rates charged by PALM COAST to any other entity. PALM COAST agrees to extend at its cost as depicted on the Map a water line and install one (1) 6-inch diameter meter.

5.3. Agreements Regarding Annexation. PALM COAST agrees

that it will not require annexation as a condition of providing retail water and wastewater service in those areas depicted on the Map that are currently in the PALM COAST's Chapter 180, *Florida Statutes*, Service Area, south and/or east of the existing PALM COAST city limits, and lands east of the Intracoastal Waterway and the provisions of this Agreement shall prevail over PALM COAST's policy relating to mandatory annexation as part of the provision of utility services in those areas. PALM COAST is not restrained by this Agreement from lawfully annexing property in accordance with the controlling provisions of State law and providing utility services to annexed areas within its City Limit; provided, however, that if PALM COAST should, in the future, annex areas into its City Limits which are now located in the COUNTY's service area, the COUNTY agrees it will negotiate in good faith but shall not be compelled to sell or transfer

the utility service customers and facilities located within such annexed area to PALM COAST at a just, full and fair market value to be determined. Any such negotiated sale shall not compromise the integrity of the COUNTY's independent operating system or adversely affect COUNTY system hydraulics. Furthermore, no such sale or transfer shall violate the terms of any agreements to which the COUNTY may be a party or any bond covenants or restrictions which may now or hereafter exist with regard to either party.

5.4. Miscellaneous Agreements. COUNTY will provide, at no cost to PALM COAST, a master pump station site either by grant of utility easement or conveyance of fee simple interest in the COUNTY-owned property located next to Hammock Dunes Bridge, said site adequate in size for use as a master pump station, but which requirement shall not require the COUNTY to procure additional lands or otherwise violate any conditions under which COUNTY holds title to the land. COUNTY and PALM COAST shall cooperate with each other regarding any and all permitting for utility development or implementing other provisions of this Agreement, including, but not limited to, development orders, development permitting, right-of-way use and well activation.

SECTION 6. AGREEMENTS OF ALL PARTIES. All Parties to this Agreement agree as follows:

6.1. Territorial Agreements. Each Party agrees that it shall honor all other Parties' service area boundary lines as specified on the Map and shall not seek to offer or provide service in the other Parties' exclusive water, wastewater, and reclaimed water service areas as depicted on the Map. Notwithstanding anything to the contrary, the Parties agree that the interlocal

agreements between PALM COAST and FLAGLER BEACH shall apply to the Colbert Lane area.

6.2. Enforceable Agreement. The Parties that are governmental entities agree and acknowledge that they have complied with the requirements of applicable law. In executing this Agreement, the Parties are involving and utilizing the authority granted pursuant to both Section 163.01, *Florida Statutes* (the "Florida Interlocal Cooperation Act of 1969"), the provisions of Part II, Chapter 163, *Florida Statutes* (2006); an agreement entered into under the home rule powers of the parties as set forth in Article VIII of the *Constitution of the State of Florida* and Chapters 125 and 166, *Florida Statutes*. Notwithstanding anything to the contrary, the Parties agree that this Agreement is valid, binding, and enforceable, and each Party warrants to all other Parties that it has the requisite power and authority to be bound by this Agreement. The Parties agree that they shall not challenge in any forum the validity or enforceability of this Agreement.

6.3. Dismissal of Proceedings. That all legal proceedings between the Parties and entities referenced above shall be dismissed upon entry of the Order, each Party to pay its own attorney's fees and costs. The Parties agree that they shall not challenge the necessary permits and approvals required by the Parties in the execution of their respective responsibilities relating to their respective utility service areas in accordance with the controlling requirements of law. Within three (3) business days after the full execution of this Agreement and the date that the Court enters the Order approving this Agreement and Dismissing the Action with Prejudice, the Parties, through their counsel, shall cause to be filed in the Circuit Court of Flagler County, Florida, a Joint Stipulation

for Dismissal, with prejudice, relative to any other litigation or any administrative proceedings that may be pending between or among the Parties.

6.4. Cooperation. Neither Party nor entity referenced above shall take any action or refrain from taking any action in a manner which is inconsistent with the intent and spirit of this Agreement. This cooperation shall include but not be limited to the support of all Parties for the approval of the modification of FLAGLER BEACH's water use permit as described in Subsection 4.3(2) hereof. The Parties that are governmental entities agree to engage in ongoing activities that will result in the provision of utility services to the public in a coordinated manner. The Parties that are governmental entities agree to exchange technical information and engage in intergovernmental coordination and collaboration in order to benefit the public. The Parties that are governmental entities agree to amend their respective comprehensive plans and codes and ordinances as may be necessary to implement the provisions of this Agreement.

SECTION 7. EFFECTIVE DATE. Upon the full execution of this Agreement by the Parties, the COUNTY shall file a certified copy of this Agreement with the Clerk of the Circuit Court for Flagler County pursuant to Section 163.01, *Florida Statutes*. This Agreement shall be effective upon the later of (1) entry of the Order by the Court and (2) filing of the Agreement by the COUNTY with the Clerk of the Circuit Court for Flagler County, and shall be perpetual in nature and be subject only to amendment by mutual agreement by all of the applicable Parties as to provisions of this Agreement that affect such Parties.

SECTION 8. RELEASES. The Parties on their own behalf and on behalf of their past and present agents, successors, assigns, and any all persons or

entities claiming through them or under them, hereby each release and forever discharge the other and their respective past, present and future parent corporations, subsidiaries, affiliates, shareholders, agents, employees, directors, officers, servants, assigns, insurers, partners, attorneys, predecessors, successors, officers, directors, staff and elected officials ("Released Parties"), from any and all claims and demands, actions and causes of action, at law or in equity, known and unknown, which either now owns or holds, or has at any time heretofore owned or held against the other or any of the Released Parties, including, but not limited to, any and all claims, demands or causes of action of any kind whatsoever arising out of this Action or any litigation pending between and among the Parties. Notwithstanding the foregoing, no Party is released of its rights or obligations under this Agreement.

SECTION 9. VENUE. The venue for all lawsuits brought by any Party hereto involving any dispute, controversy, or claim arising out of or in connection with this Agreement shall be brought in the Circuit Court of Flagler County, Florida.

SECTION 10. BINDING UPON SUCCESSORS. This Agreement shall be binding upon and inure to the benefit of the Parties hereto and their respective successors, heirs, parent corporations, subsidiaries, affiliates, representatives, and assigns. Without limiting the foregoing, the POA's rights and benefits under this Agreement shall inure to the benefit of Hammock Beach River Club, LLC; Ginn-LA Bulow, Ltd., LLLP; Ginn Golf, LLC; Ginn Development Company, LLC; The Club at Hammock Beach, LLC; Northshore Ocean Hammock Investment Ltd., LLLP; other PUD Property owners; and The Gardens at Hammock Beach Community Development District (collectively, the "POA Parties"). The POA

shall not be required to obtain the consent of any other Party to full or partial assignment of its rights under this Agreement to the POA Parties.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement as of the date first above written.

ATTEST:

FLAGLER BEACH

CITY OF FLAGLER BEACH

Angela M Apperson
Angela Apperson, City Clerk

By Alice M. Baker
ALICE M. BAKER, Mayor

Date: 1/25/07

UNOFFICIAL DOCUMENT

COUNTY

FLAGLER COUNTY, FLORIDA

Christie L. Mayer

Print Name: CHRISTIE L. MAYER

Carl Laurdrie

Print Name: CARL LAURDRIE

By: ^{1.26.07} James A. Darby

Name: JAMES A. DARBY

Title: CHAIRMAN, FLAGLER COUNTY BOARD OF COUNTY COMMISSIONERS

APPROVED AS TO FORM AND LEGALITY.

James A. Darby

STATE OF FLORIDA
COUNTY OF FLAGLER

The foregoing instrument was acknowledged before me this 26th day of January, 2007 by JAMES A. DARBY, the CHAIRMAN, BOCC of Flagler County, on behalf of Flagler County, He is personally known to me and did not take an oath.



Christie L. Mayer
MY COMMISSION # DD196978 EXPIRES
April 8, 2007
BONDED THRU TROY FAIN INSURANCE, INC.

AFFIX NOTARY STAMP

Christie L. Mayer

Signature of Notary Public

CHRISTIE L. MAYER

Print Notary Name

My Commission Expires: 4/8/07

Commission No.: DD196978

Personally known, or
 Produced Identification
Type of Identification Produced

UNOFFICIAL INSTRUMENT

POA

THE GARDENS AT HAMMOCK
BEACH PROPERTY OWNERS'
ASSOCIATION, INC., f/k/a
HAMMOCK BEACH RIVER CLUB
PROPERTY OWNERS'
ASSOCIATION, INC.

Deborah Smith

Print Name: Deborah Smith

GREG FORD

Print Name: GREG FORD

By: Daniel Baker

Name: Daniel Baker

Title: Vice President

STATE OF FLORIDA
COUNTY OF FLAGLER

The foregoing instrument was acknowledged before me this 26 day
of JANUARY, 2007 by DANIEL BAKER, the VICE PRESIDENT
of The Gardens at Hammock Beach Property Owners' Association, Inc., f/k/a
Hammock Beach River Club Property Owners' Association, Inc., on behalf of The
Gardens at Hammock Beach Property Owners' Association, Inc. He is
personally known to me and did not take an oath.

Joan M. Raby
Signature of Notary Public

JOAN M. RABY

Print Notary Name

My Commission Expires: 2-21-2010

Commission No.: DD 520633

AFFIX NOTARY STAMP

Personally known, or
 Produced Identification
Type of Identification Produced

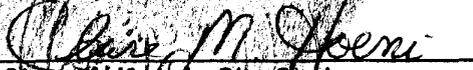


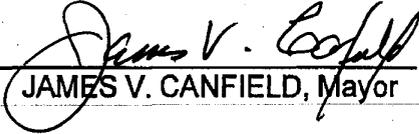
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ATTEST:

PALM COAST

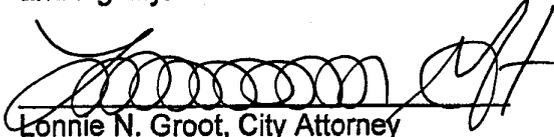
CITY OF PALM COAST


Claire M. Hoen, City Clerk

By: 
JAMES V. CANFIELD, Mayor

Date: 1-31-07

For use and reliance of the Palm Coast
City Council only. Approved as to form
and legality.


Lonnie N. Groot, City Attorney
JANUARY 30, 2007


Richard M. Kelton, City Manager

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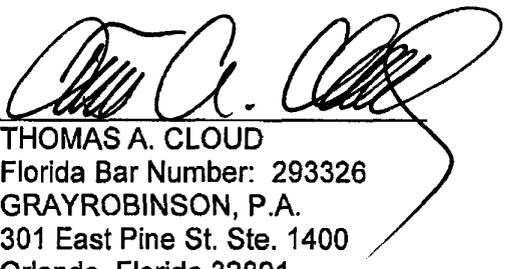
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850-656-4029 Facsimile
Counsel for Plaintiff
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PROPERTY OWNERS' ASSOCIATION,
INC., n/k/a THE GARDENS AT
HAMMOCK BEACH PROPERTY
OWNERS' ASSOCIATION, INC.

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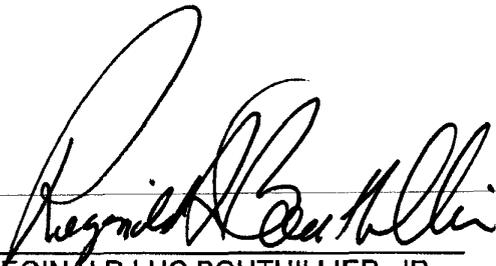
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CITY OF PALM COAST, FLORIDA
1/30/07

UNOFFICIAL

EXHIBIT "A"

MAP

UNOFFICIAL DOCUMENT

Exhibit "B"
PUD Property Description

UNOFFICIAL DOCUMENT

EXHIBIT "B"

LEGAL DESCRIPTION

PARCEL "A"

A PARCEL OF LAND LYING IN SECTIONS 10, 11, 14, 15, 38, AND 39, TOWNSHIP 12 SOUTH, RANGE 31 EAST, FLAGLER COUNTY, FLORIDA, AND BEING A PORTION OF THOSE LANDS AS DESCRIBED IN OFFICIAL RECORDS BOOK 26, PAGE 558 OF THE PUBLIC RECORDS OF SAID FLAGLER COUNTY, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

FOR A POINT OF REFERENCE, COMMENCE AT A POINT ON THE SOUTHERLY RIGHT OF WAY LINE OF STATE ROAD 100, (ALSO KNOWN AS MOODY BOULEVARD), BEING THE NORTHEAST CORNER OF THOSE LANDS AS DESCRIBED IN OFFICIAL RECORDS BOOK 22, PAGE 128 OF THE PUBLIC RECORDS OF FLAGLER COUNTY, FLORIDA; THENCE S02°11'10"E, DEPARTING SAID RIGHT OF WAY LINE, A DISTANCE OF 1200.23 FEET TO THE POINT OF BEGINNING.

FROM THE POINT OF BEGINNING, THENCE N87°21'40"E, A DISTANCE OF 4304.57 FEET; THENCE N88°32'23"E, A DISTANCE OF 330.58 FEET; THENCE N88°28'36"E, A DISTANCE OF 2641.30 FEET; THENCE S01°24'50"E, A DISTANCE OF 345.10 FEET; THENCE S88°36'24"W, A DISTANCE OF 150.00 FEET; THENCE S01°28'15"E, A DISTANCE OF 300.30 FEET; THENCE N88°38'24"E, A DISTANCE OF 150.00 FEET; THENCE S01°08'43"E, A DISTANCE OF 24.77 FEET; THENCE N88°54'22"E, A DISTANCE OF 749.54 FEET TO A POINT ON THE WESTERLY RIGHT OF WAY LINE OF STATE ROAD 201, (ALSO KNOWN AS JOHN ANDERSON HIGHWAY), THENCE S18°11'55"E ALONG SAID WESTERLY RIGHT OF WAY LINE, A DISTANCE OF 401.46 FEET; THENCE S77°14'08"W, DEPARTING SAID RIGHT OF WAY LINE, A DISTANCE OF 99.57 FEET; THENCE S01°16'02"E, A DISTANCE OF 216.94 FEET; THENCE S88°50'35"W, A DISTANCE OF 126.47 FEET; THENCE S01°10'25"E, A DISTANCE OF 660.84 FEET; THENCE N88°37'24"E, A DISTANCE OF 158.75 FEET; THENCE S18°14'33"E, A DISTANCE OF 330.09 FEET; THENCE N88°50'18"E, A DISTANCE OF 330.04 FEET TO A POINT ON THE AFOREMENTIONED WEST RIGHT OF WAY LINE OF STATE ROAD 201; THENCE S18°14'52"E ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 1793.42 FEET; THENCE S18°10'03"E CONTINUING ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 3179.91 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE NORTHEASTERLY HAVING A RADIUS OF 1196.28 FEET; THENCE SOUTHEASTERLY ALONG SAID CURVE AND CONTINUING ALONG SAID RIGHT OF WAY LINE, THROUGH A CENTRAL ANGLE OF 22°09'31", AN ARC DISTANCE OF 462.65 FEET TO THE POINT OF TANGENCY, SAID CURVE BEING SUBTENDED BY A CHORD BEARING AND DISTANCE OF S29°14'49"E, 459.77 FEET; THENCE S40°19'34"E CONTINUING ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 775.72 FEET TO THE

UNOFFICIAL

BOO. 1026 PAGE: 0423

SOUTHEAST CORNER OF THE MONUMENTED SOUTHERLY LINE OF THOSE LANDS AS DESCRIBED IN DEED BOOK 26, PAGE 558 OF SAID PUBLIC RECORDS; THENCE S69°18'54"W ALONG SAID SOUTHERLY LINE, A DISTANCE OF 8705.99 FEET TO A POINT ON THE EASTERLY RIGHT OF WAY LINE OF STATE ROAD 5A, (ALSO KNOWN AS OLD KINGS ROAD); THENCE N26°39'29"W ALONG SAID EASTERLY RIGHT OF WAY LINE, A DISTANCE OF 4.52 FEET; THENCE N26°28'14"W A DISTANCE OF 126.15 FEET; THENCE N69°18'54"E DEPARTING SAID RIGHT OF WAY A DISTANCE OF 1415.84 FEET TO THE WESTERLY EXTENDED LINE OF OFFICIAL RECORDS BOOK 397, PAGE 332 -AND OFFICIAL RECORDS BOOK 402, PAGE 101; THENCE N20°40'59"W A DISTANCE OF 881.67 FEET; THENCE N76°49'01"E A DISTANCE 181.51 FEET; THENCE N13°10'59"W A DISTANCE OF 1877.17 FEET; THENCE S76°49'01"W TO A POINT ON A LINE AS RECORDED IN OFFICIAL RECORD BOOK 274, PAGE 894 A DISTANCE OF 205.26 FEET; THENCE CONTINUING ALONG SAID BOOK AND PAGE THE FOLLOWING FOUR CALLS, N30°41'26"W A DISTANCE OF 142.28 FEET; THENCE N13°04'14"W A DISTANCE OF 254.18 FEET; THENCE N21°33'19"W A DISTANCE OF 481.89 FEET; THENCE N11°45'17"W A DISTANCE OF 442.18 FEET; THENCE N30°05'11"W DEPARTING THE EASTERLY LINE OF SAID BOOK AND PAGE A DISTANCE OF 1151.29 FEET TO THE NORTHEAST CORNER OF OFFICIAL RECORDS BOOK 274, PAGE 894 AND OFFICIAL RECORDS BOOK 277, PAGE 100; THENCE N21°11'01"W A DISTANCE OF 2727.00 FEET; THENCE N19°04'21"W, A DISTANCE OF 458.74 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE SOUTHWESTERLY HAVING A RADIUS OF 300.00 FEET; THENCE NORTHWESTERLY ALONG SAID CURVE, THROUGH A CENTRAL ANGLE OF 57°12'26", AN ARC DISTANCE OF 299.53 FEET TO THE POINT OF TANGENCY, SAID CURVE BEING SUBTENDED BY A CHORD BEARING AND DISTANCE OF N47°35'58"W, 287.25 FEET; THENCE N76°12'10"W, A DISTANCE OF 101.30 FEET; THENCE N50°40'00"W, A DISTANCE OF 263.61 FEET; THENCE N07°54'38"W, A DISTANCE OF 962.35 FEET; THENCE N02°30'05"W, A DISTANCE OF 229.54 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE SOUTHWESTERLY HAVING A RADIUS OF 300.00 FEET; THENCE NORTHWESTERLY ALONG SAID CURVE, THROUGH A CENTRAL ANGLE OF 43°58'32", AN ARC DISTANCE OF 230.26 FEET TO THE POINT OF TANGENCY, SAID CURVE BEING SUBTENDED BY A CHORD BEARING AND DISTANCE OF N24°26'47"W, 224.64 FEET; THENCE N46°25'30"W, A DISTANCE OF 324.38 FEET; THENCE N36°12'00"W, A DISTANCE OF 251.06 FEET; THENCE N02°32'28"W, A DISTANCE OF 69.67 FEET; THENCE N87°48'42"E, A DISTANCE OF 58.22 FEET TO THE POINT OF BEGINNING.

CONTAINING: 68,041,746 SQUARE FEET OR 1,562.02 ACRES, MORE OR LESS AS SHOWN ON THAT CERTAIN BOUNDARY SURVEY PREPARED BY ALBERT D. BRADSHAW (NO. 5257) OF PRIVETT-NILES AND ASSOCIATES, INC., DATED DECEMBER 31, 2003, PROJECT NO. 658-001.

LESS AND EXCEPT

PARCEL "A-1"

A PARCEL OF LAND LOCATED IN SECTION 38, TOWNSHIP 12 SOUTH, RANGE 31 EAST, FLAGLER COUNTY, FLORIDA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

FROM A POINT OF BEGINNING BEING THE INTERSECTION OF THE EASTERLY RIGHT-OF-WAY LINE OF OLD KINGS ROAD (STATE ROAD 5A, A 100 FOOT WIDE RIGHT-OF-WAY) WITH THE SOUTHERLY LINE OF LANDS AS DESCRIBED IN DEED BOOK 26, PAGES 558 THROUGH 569 OF THE PUBLIC RECORDS OF FLAGLER COUNTY, FLORIDA; THENCE ALONG SAID EASTERLY RIGHT-OF-WAY LINE N26°39'29"W FOR A DISTANCE OF 4.52 FEET; THENCE CONTINUING ALONG SAID EASTERLY RIGHT-OF-WAY LINE N26°28'14"W FOR A DISTANCE OF 126.15 FEET; THENCE DEPARTING SAID EASTERLY RIGHT-OF-WAY LINE N69°18'54"E FOR A DISTANCE OF 1415.84 FEET; THENCE S20°40'59"E FOR A DISTANCE OF 130.00 FEET TO THE SAID SOUTHERLY LINE OF LANDS AS DESCRIBED IN DEED BOOK 26, PAGES 558 THROUGH 569; THENCE ALONG SAID SOUTHERLY LINE S69°18'54"W FOR A DISTANCE OF 1402.65 FEET TO THE AFOREMENTIONED POINT OF BEGINNING OF THIS DESCRIPTION.

THE ABOVE DESCRIBED PARCEL OF LAND CONTAINS 4.21 ACRES, MORE OR LESS AS SHOWN ON THAT CERTAIN BOUNDARY SURVEY PREPARED BY ALBERT D. BRADSHAW (NO. 5257) OF PRIVETT-NILES AND ASSOCIATES, INC., DATED DECEMBER 31, 2003, PROJECT NO. 658-001.

TOGETHER WITH

PARCEL "B"

A PARCEL OF LAND IN THE SOUTH 1/2 OF SECTION 11, TOWNSHIP 12 SOUTH, RANGE 31 EAST, FLAGLER COUNTY, FLORIDA MORE PARTICULARLY DESCRIBED AS FOLLOWS;

A POINT OF REFERENCE BEING THE SOUTHEAST CORNER OF GOVERNMENT SECTION 10, TOWNSHIP 12 SOUTH, RANGE 31 EAST AS MONUMENTED BY A 4"x4" CONCRETE MONUMENT INSCRIBED WITH A "T"; THENCE NORTH 01 DEGREES 28 MINUTES 02 SECONDS WEST, ALONG THE WEST LINE OF SECTION 11, A DISTANCE OF 1263.34 FEET TO A POINT ON

UNOFFICIAL DOCUMENT

BOOK 1026 PAGE: 0425

THE SOUTHERLY LINE OF LANDS KNOWN AS THE LANDS VESTED BY THE AGREEMENT BETWEEN ITT COMMUNITY DEVELOPMENT CORPORATION AND THE DIVISION OF STATE PLANNING OF THE DEPARTMENT OF ADMINISTRATION, STATE OF FLORIDA AS RECORDED IN OFFICIAL RECORDS BOOK 352, PAGES 75 THROUGH 768, INCLUSIVE; THENCE NORTH 87 DEGREES 21 MINUTES 29 SECONDS EAST ALONG SAID SOUTHERLY LINE, A DISTANCE OF 225.57 FEET; THENCE NORTH 87 DEGREES 21 MINUTES 29 SECONDS EAST, A DISTANCE OF 104.57 FEET; THENCE ALONG SAID SOUTHERLY LINE NORTH 88 DEGREES 32 MINUTES 12 SECONDS EAST A DISTANCE OF 330.58 FEET TO THE POINT OF BEGINNING OF THIS DESCRIPTION; THENCE NORTH 01 DEGREES 27 MINUTES 01 SECONDS WEST, A DISTANCE OF 1088.02 FEET TO A POINT ON THE SOUTHERLY RIGHT OF WAY LINE OF STATE ROAD 100 (A 200 FOOT RIGHT OF WAY AS NOW ESTABLISHED); THENCE ALONG SAID SOUTHERLY RIGHT OF WAY LINE, SOUTH 89 DEGREES 28 MINUTES 56 SECONDS EAST, A DISTANCE OF 959.84 FEET; THENCE, DEPARTING SAID SOUTHERLY RIGHT OF WAY LINE, SOUTH 00 DEGREES 31 MINUTES 04 SECONDS WEST, A DISTANCE OF 210.00 FEET; THENCE SOUTH 89 DEGREES 28 MINUTES 56 SECONDS EAST, A DISTANCE OF 210.00 FEET; THENCE SOUTH 00 DEGREES 31 MINUTES 04 SECONDS WEST, A DISTANCE 390.00 FEET; THENCE SOUTH 89 DEGREES 28 MINUTES 56 SECONDS EAST, A DISTANCE OF 822.42 FEET; THENCE SOUTH 00 DEGREES 06 MINUTES 52 SECONDS EAST, A DISTANCE OF 417.46 FEET TO A POINT ON THE SOUTHERLY LINE OF SAID VESTED LANDS; THENCE SOUTH 88 DEGREES 28 MINUTES 25 SECONDS WEST ALONG SAID SOUTHERLY LINE, A DISTANCE OF 560.75 FEET; THENCE SOUTH 88 DEGREES 28 MINUTES 25 SECONDS WEST, ALONG SAID SOUTHERLY LINE A DISTANCE OF 1,400.00 FEET TO THE POINT OF BEGINNING.

CONTAINING 35.38 ACRES MORE OR LESS AS SHOWN ON THAT CERTAIN BOUNDARY SURVEY PREPARED BY ALBERT D. BRADSHAW (NO. 5257) OF PRIVETT-NILES AND ASSOCIATES, INC., DATED DECEMBER 31, 2003, PROJECT NO. 658-001.

TOGETHER WITH

PARCEL "C"

A PARCEL OF LAND LYING IN SECTION 12, TOWNSHIP 12 SOUTH, RANGE 31 EAST, FLAGLER COUNTY, FLORIDA AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT 4 INCH BY 4 INCH CONCRETE MONUMENT MARKED WITH A "+" ON TOP, SAID POINT BEING THE SOUTHWEST CORNER OF SAID SECTION 12; THENCE NORTH 01°30'23" WEST, DEPARTING SAID SOUTHERLY LINE AND ALONG THE WESTERLY LINE OF SAID SECTION, A DISTANCE OF 1,203.23 FEET; THENCE NORTH 88°52'15" EAST, DEPARTING SAID WESTERLY

BOOK 1026 PAGE: 0426

SECTION LINE, A DISTANCE OF 649.96 FEET; THENCE SOUTH 19°00'27" EAST, A DISTANCE OF 1,265.64 FEET TO THE SOUTHERLY LINE OF SAID SECTION; THENCE SOUTH 88°56'30" WEST, ALONG SAID SECTION LINE, A DISTANCE OF 1,030.73 FEET TO THE POINT OF BEGINNING.

CONTAINING 1,011,514 SQUARE FEET OR 23.22 ACRES, MORE OR LESS AS SHOWN ON THAT CERTAIN BOUNDARY SURVEY PREPARED BY ALBERT D. BRADSHAW (NO. 5257) OF PRIVETT-NILES AND ASSOCIATES, INC., DATED DECEMBER 31, 2003, PROJECT NO. 658-001.

TOGETHER WITH

PARCEL "D"

A PARCEL OF LAND IN SECTION 10, 11 AND 39, TOWNSHIP 12 SOUTH RANGE 31 EAST, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

A POINT OF REFERENCE BEING THE SOUTHEAST CORNER OF GOVERNMENT SECTION 10, TOWNSHIP 12 SOUTH, RANGE 31 EAST AS MONUMENTED BY A 4" X 4" CONCRETE MONUMENT INSCRIBED WITH A "T"; THENCE SOUTH 87 DEGREES 22 MINUTES 23 SECONDS WEST, ALONG THE SOUTH LINE OF SECTION 10, A DISTANCE OF 244.44 FEET TO A POINT ON THE EASTERLY LINE OF SECTION 39, TOWNSHIP 12 SOUTH, RANGE 31 EAST, SAID POINT BEING THE SOUTHWEST CORNER OF SAID SECTION 10 AS MONUMENTED BY A 4" X 4" CONCRETE MONUMENT INSCRIBED WITH A "T"; THENCE NORTH 20 DEGREES 42 MINUTES 23 SECONDS WEST ALONG THE EASTERLY LINE OF SAID SECTION 39, A DISTANCE OF 1328.49 FEET TO A POINT ON THE SOUTHERLY LINE OF LANDS KNOWN AS THE LANDS VESTED BY THE AGREEMENT BETWEEN IIT COMMUNITY DEVELOPMENT CORPORATION AND THE DIVISION OF STATE PLANNING OF THE DEPARTMENT OF ADMINISTRATION, STATE OF FLORIDA AS RECORDED IN OFFICIAL RECORDS BOOK 352, PAGES 759 THROUGH 768, INCLUSIVE, SAID POINT BEING THE POINT OF BEGINNING OF THIS DESCRIPTION; THENCE SOUTH 87 DEGREES 21 MINUTES 40 SECONDS WEST ALONG SAID SOUTHERLY LINE, A DISTANCE OF 3291.83 FEET; THENCE, DEPARTING SAID SOUTHERLY LINE, NORTH 02 DEGREES 11 MINUTES 10 SECONDS WEST, A DISTANCE OF 1200.23 FEET TO A POINT ON THE SOUTHERLY RIGHT OF WAY OF STATE ROAD 100 (A 200 FOOT RIGHT OF WAY AS NOW ESTABLISHED); THENCE ALONG SAID SOUTHERLY RIGHT OF WAY LINE NORTH 87 DEGREES 48 MINUTES 42 SECONDS EAST, A DISTANCE OF 514.27 FEET TO THE NORTHWEST CORNER OF THE FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) WATER RETENTION AREA NUMBER 2 AS RECORDED IN OFFICIAL RECORDS BOOK 497, PAGES 1771 THROUGH 1773, INCLUSIVE; THENCE, DEPARTING SAID RIGHT OF WAY LINE, SOUTH 02 DEGREES 11 MINUTES 10 SECONDS EAST ALONG THE WESTERLY LINE OF SAID FDOT LANDS, A DISTANCE OF 415.00 FEET; THENCE ALONG THE

UNOFFICIAL

BOOK 1026 PAGE 0427

SOUTHERLY LINE OF SAID FDOT LANDS NORTH 87 DEGREES 48 MINUTES 42 SECONDS EAST, A DISTANCE OF 300.87 FEET; THENCE ALONG THE EASTERLY LINE OF SAID FDOT LANDS NORTH 02 DEGREES 11 MINUTES 18 SECONDS WEST, A DISTANCE OF 415.00 FEET TO A POINT ON THE SOUTHERLY RIGHT OF WAY LINE OF SAID STATE ROAD 100; THENCE ALONG SAID SOUTHERLY RIGHT OF WAY LINE NORTH 87 DEGREES 48 MINUTES 42 SECONDS EAST, A DISTANCE OF 384.95 FEET; THENCE CONTINUE ALONG SAID RIGHT OF WAY LINE NORTH 87 DEGREES 48 MINUTES 42 SECONDS EAST A DISTANCE OF 1155.17 FEET TO THE POINT OF CURVATURE OF A CURVE CONCAVE SOUTHERLY HAVING A CENTRAL ANGLE OF 01 DEGREE 22 MINUTES 12 SECONDS, A RADIUS OF 22818.31 FEET, A CHORD BEARING OF NORTH 88 DEGREES 28 MINUTES 21 SECONDS EAST; THENCE ALONG THE ARC OF SAID CURVE A DISTANCE OF 545.65 FEET TO THE INTERSECTION OF THE SOUTHERLY RIGHT OF WAY OF STATE ROAD 100 AND THE EASTERLY LINE OF SAID SECTION 39 AS PRESENTLY MONUMENTED, BEING A POINT OF CURVATURE OF A CURVE CONCAVE SOUTHERLY HAVING A CENTRAL ANGLE OF 01 DEGREE 20 MINUTES 10 SECONDS, A RADIUS OF 22818.31 FEET, A CHORD BEARING OF NORTH 89 DEGREES 49 MINUTES 32 SECONDS EAST; THENCE ALONG THE ARC OF SAID CURVE AND SOUTHERLY RIGHT OF WAY, A DISTANCE OF 532.07 FEET; THENCE SOUTH 89 DEGREES 28 MINUTES 56 SECONDS EAST, A DISTANCE OF 231.02 FEET TO THE NORTHWEST CORNER OF THE FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) WATER RETENTION AREA NUMBER 3 AS RECORDED IN OFFICIAL RECORDS BOOK 497, PAGES 1771 THROUGH 1773, INCLUSIVE; THENCE, DEPARTING SAID SOUTHERLY RIGHT OF WAY LINE, ALONG THE WESTERLY LINE OF SAID FDOT LANDS SOUTH 01 DEGREE 27 MINUTES 45 SECONDS EAST, A DISTANCE OF 500.15 FEET; THENCE ALONG THE SOUTHERLY LINE OF SAID FDOT LANDS SOUTH 89 DEGREES 28 MINUTES 11 SECONDS EAST, A DISTANCE OF 325.06 FEET; THENCE ALONG THE EASTERLY LINE OF SAID FDOT LANDS NORTH 01 DEGREES 27 MINUTES 45 SECONDS WEST, A DISTANCE OF 500.22 FEET TO A POINT ON THE SOUTHERLY RIGHT OF WAY LINE OF SAID STATE ROAD 100; THENCE ALONG THE SAID SOUTHERLY RIGHT OF WAY LINE SOUTH 89 DEGREES 28 MINUTES 58 SECONDS EAST, A DISTANCE OF 330.90 FEET; THENCE, DEPARTING SAID SOUTHERLY RIGHT OF WAY LINE, SOUTH 01 DEGREE 26 MINUTES 59 SECONDS EAST, A DISTANCE OF 1099.15 FEET TO A POINT ON THE AFOREMENTIONED SOUTHERLY LINE OF THE VESTED LANDS; THENCE ALONG THE SAID SOUTHERLY LINE SOUTH 87 DEGREES 21 MINUTES 40 SECONDS WEST, A DISTANCE OF 1012.74 FEET TO THE POINT OF BEGINNING.

CONTAINING 109.40 ACRES MORE OR LESS AS SHOWN ON THAT CERTAIN BOUNDARY SURVEY PREPARED BY ALBERT D. BRADSHAW (NO. 5257) OF PRIVETT-NILES AND ASSOCIATES, INC., DATED DECEMBER 31, 2003, PROJECT NO. 658-001.

BOOK 1026 PAGE 0428

LESS AND EXCEPT

PARCEL D-"1"

A PARCEL OF LAND LOCATED IN GOVERNMENT SECTION 10, TOWNSHIP 12 SOUTH, RANGE 31 EAST, FLAGLER COUNTY, FLORIDA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

AS A POINT OF REFERENCE, COMMENCE AT THE SOUTHEAST CORNER OF SECTION 10, TOWNSHIP 12 SOUTH, RANGE 31 EAST, FLAGLER COUNTY, FLORIDA; THENCE ALONG THE EAST LINE OF SAID SECTION 10, N01°27'45"W FOR A DISTANCE OF 1263.77 FEET TO THE SOUTHERLY LINE OF LANDS KNOWN AS THE LANDS VESTED BY THE AGREEMENT BETWEEN ITT COMMUNITY DEVELOPMENT CORPORATION AND THE DIVISION OF STATE PLANNING OF THE DEPARTMENT OF ADMINISTRATION, STATE OF FLORIDA, AS RECORDED IN OFFICIAL RECORDS BOOK 352, PAGES 759 THROUGH 768, PUBLIC RECORDS OF FLAGLER COUNTY, FLORIDA, AND THE POINT OF BEGINNING OF THIS DESCRIPTION; THENCE DEPARTING SAID EAST LINE ALONG SAID SOUTHERLY LINE, S87°21'40"W FOR A DISTANCE OF 324.93 FEET; THENCE DEPARTING SAID SOUTHERLY LINE N01°27'45"W FOR A DISTANCE OF 635.13 FEET TO THE SOUTHERLY LINE OF LANDS KNOWN AS WATER RETENTION AREA 3; THENCE ALONG SAID SOUTHERLY LINE S89°28'11"E FOR A DISTANCE OF 325.06 FEET; THENCE DEPARTING SAID SOUTHERLY LINE S01°27'45"E FOR A DISTANCE OF 617.15 FEET TO THE AFOREMENTIONED POINT OF BEGINNING OF THIS DESCRIPTION.

THE ABOVE DESCRIBED PARCEL OF LAND CONTAINS 4.67 ACRES, MORE OR LESS AS SHOWN ON THAT CERTAIN BOUNDARY SURVEY PREPARED BY ALBERT D. BRADSHAW (NO. 5257) OF PRIVETT NILES AND ASSOCIATES, INC., DATED DECEMBER 31, 2003, PROJECT NO. 658-001.

AND LESS AND EXCEPT

PARCEL D-"2"

A PARCEL OF LAND LOCATED IN GOVERNMENT SECTION 11, TOWNSHIP 12 SOUTH, RANGE 31 EAST, FLAGLER COUNTY,

UNOFFICIAL

BOOK: 1026 PAGE: 0429

FLORIDA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

AS A POINT OF REFERENCE, COMMENCE AT THE SOUTHEAST CORNER OF SECTION 10 (ALSO BEING THE SOUTHWEST CORNER OF SAID SECTION 11), TOWNSHIP 12 SOUTH, RANGE 31 EAST, FLAGLER COUNTY, FLORIDA; THENCE ALONG THE EAST LINE OF SAID SECTION 10, N01°27'45"W FOR A DISTANCE OF 1263.77 FEET TO THE SOUTHERLY LINE OF LANDS KNOWN AS THE LANDS VESTED BY THE AGREEMENT BETWEEN ITT COMMUNITY DEVELOPMENT CORPORATION AND THE DIVISION OF STATE PLANNING OF THE DEPARTMENT OF ADMINISTRATION, STATE OF FLORIDA, AS RECORDED IN OFFICIAL RECORDS BOOK 352, PAGES 759 THROUGH 768, PUBLIC RECORDS OF FLAGLER COUNTY, FLORIDA, AND THE POINT OF BEGINNING OF THIS DESCRIPTION; THENCE CONTINUE ALONG SAID EAST LINE (AND ALONG THE EAST LINE OF LANDS KNOWN AS WATER RETENTION AREA 3), N01°27'45"W FOR A DISTANCE OF 1117.37 FEET TO THE SOUTHERLY RIGHT-OF-WAY LINE OF STATE ROAD 100 (A 200 FOOT WIDE RIGHT-OF-WAY); THENCE DEPARTING SAID EAST LINE ALONG SAID SOUTHERLY LINE S89°28'56"E FOR A DISTANCE OF 330.90 FEET; THENCE DEPARTING SAID SOUTHERLY LINE S01°26'59"E FOR A DISTANCE OF 1099.15 FEET; THENCE S87°21'40"W FOR A DISTANCE OF 330.53 FEET TO THE AFOREMENTIONED POINT OF BEGINNING OF THIS DESCRIPTION.

THE ABOVE DESCRIBED PARCEL OF LAND CONTAINS 8.41 ACRES, MORE OR LESS AS SHOWN ON THAT CERTAIN BOUNDARY SURVEY PREPARED BY ALBERT D. BRADSHAW (NO. 5257) OF PRIVETT-NILES AND ASSOCIATES, INC., DATED DECEMBER 31, 2003, PROJECT NO. 658-001.

TOGETHER WITH

Parcel "E" (on survey by Tomoka Engineering)

A PARCEL OF LAND LOCATED IN GOVERNMENT SECTIONS 13, 14 AND 38, TOWNSHIP 12 SOUTH, RANGE 31 EAST, FLAGLER COUNTY, FLORIDA, BEING A PORTION OF LANDS AS DESCRIBED IN OFFICIAL RECORDS BOOK 104, PAGES 131 THROUGH 133 OF THE PUBLIC RECORDS OF FLAGLER COUNTY, FLORIDA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BOOK: 1026 PAGE: 0430

BEGINNING AT THE INTERSECTION OF THE EAST RIGHT-OF-WAY LINE OF JOHN ANDERSON HIGHWAY (STATE ROAD 201, A 100 FOOT WIDE RIGHT-OF-WAY) WITH THE NORTH LINE OF SECTION 38, TOWNSHIP 12 SOUTH, RANGE 31 EAST; THENCE ALONG SAID EAST RIGHT-OF-WAY LINE OF JOHN ANDERSON HIGHWAY $N18^{\circ}14'59''W$ FOR A DISTANCE OF 2087.53 FEET; THENCE DEPARTING SAID RIGHT-OF-WAY LINE $N88^{\circ}47'53''E$ FOR A DISTANCE OF 710.35 FEET TO A POINT ON THE WEST LINE OF SECTION 13, TOWNSHIP 12 SOUTH, RANGE 31 EAST; THENCE ALONG SAID WEST LINE $N01^{\circ}13'39''W$ FOR A DISTANCE OF 661.23 FEET TO THE NORTHWEST CORNER OF SAID SECTION 13; THENCE DEPARTING SAID WEST LINE ALONG THE NORTH LINE OF SAID SECTION 13 (A PORTION OF WHICH BEING THE SOUTH LINE OF CUSTER'S PALM HARBOR SUBDIVISION AS RECORDED IN MAP BOOK 27, PAGE 10 OF THE PUBLIC RECORDS OF FLAGLER COUNTY, FLORIDA) $N88^{\circ}56'19''E$ FOR A DISTANCE OF 1890.40 FEET TO THE WESTERLY RIGHT-OF-WAY LINE OF THE FLORIDA INTRACOASTAL WATERWAY (A 500 FOOT WIDE RIGHT-OF-WAY); THENCE DEPARTING SAID NORTH LINE ALONG SAID WESTERLY LINE $S13^{\circ}59'24''E$ FOR A DISTANCE OF 2750.14 FEET; THENCE CONTINUING ALONG SAID WESTERLY LINE $S21^{\circ}17'54''E$ FOR A DISTANCE OF 2767.63 FEET TO THE SOUTHERLY LINE OF LANDS AS DESCRIBED IN DEED BOOK 26, PAGES 558 THROUGH 569, PUBLIC RECORDS OF FLAGLER COUNTY, FLORIDA; THENCE DEPARTING SAID WESTERLY LINE ALONG SAID SOUTHERLY LINE $S69^{\circ}10'09''W$ FOR A DISTANCE OF 2520.12 FEET TO A POINT ON SAID EAST RIGHT-OF-WAY LINE OF JOHN ANDERSON HIGHWAY; THENCE DEPARTING SAID SOUTHERLY LINE ALONG SAID EASTERLY LINE $N40^{\circ}21'40''W$ FOR A DISTANCE OF 74.31 FEET TO A POINT OF CURVATURE; THENCE NORTHWESTERLY ALONG THE ARC OF A CURVE TO THE RIGHT (CONCAVE NORTHEASTERLY) 423.92 FEET, SAID CURVE HAVING A RADIUS OF 1096.28 FEET, A CENTRAL ANGLE OF $22^{\circ}09'21''$, A CHORD BEARING $N29^{\circ}14'16''W$ AND A CHORD DISTANCE OF 421.29 FEET; THENCE DEPARTING SAID CURVE, CONTINUING ALONG SAID EASTERLY LINE $N18^{\circ}10'26''W$ FOR A DISTANCE OF 3184.44 FEET TO THE AFOREMENTIONED POINT OF BEGINNING OF THIS DESCRIPTION.

THE ABOVE DESCRIBED PARCEL OF LAND CONTAINS 340.368 ACRES (14,826,430 SQUARE FEET), MORE OR LESS AS SHOWN ON THAT CERTAIN BOUNDARY SURVEY OF A PORTION OF GOVERNMENT SECTIONS 13, 14 AND 38, TOWNSHIP 12 SOUTH, RANGE 31 EAST, FLAGLER COUNTY, FLORIDA PREPARED BY KENNETH J. KUCHAR (NO. 6105) OF TOMOKA ENGINEERING, DATED DECEMBER 24, 2003, PROJECT NO. T1008GINN-A.

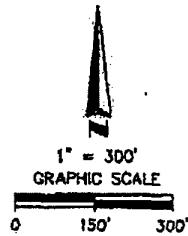
SKETCH OF DESCRIPTION:

SHOPPING CENTER
 DEED BOOK 26
 PAGES 558-559
 NOW OR FORMERLY

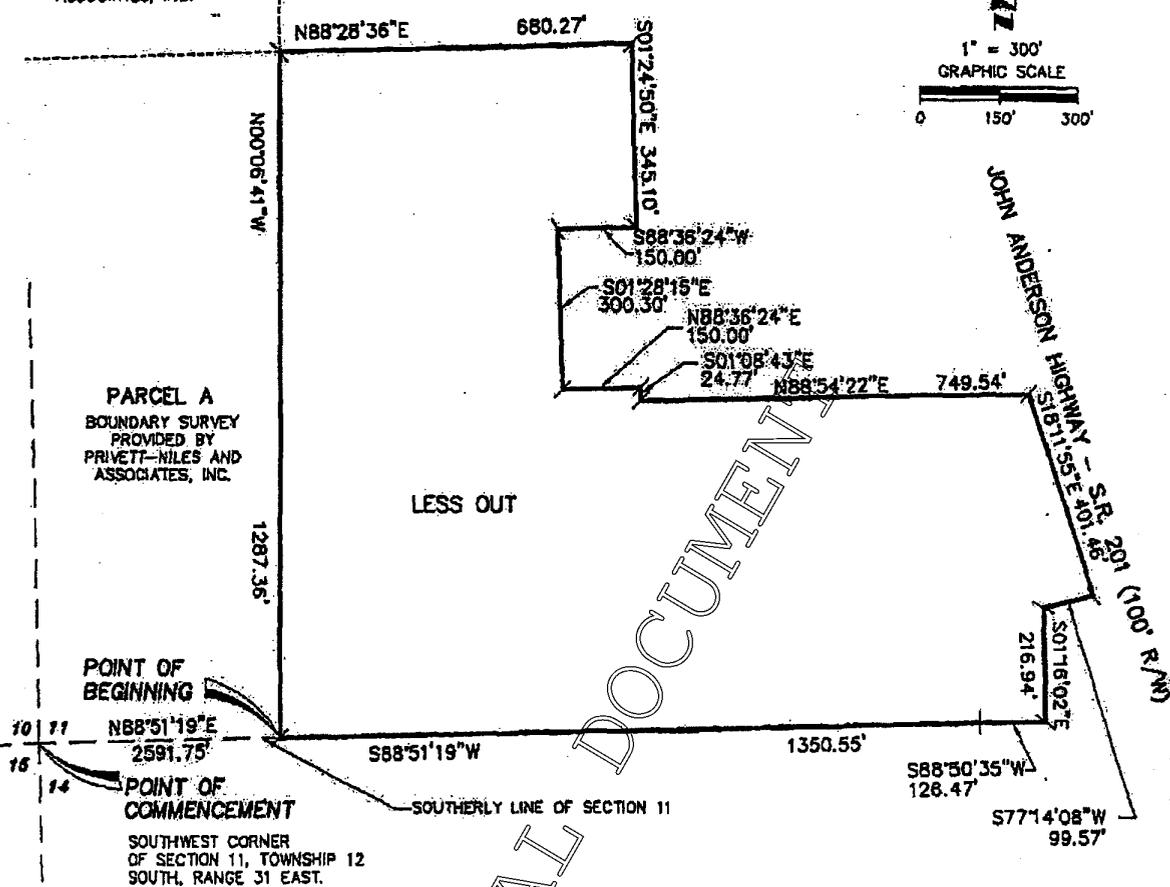
PARCEL B
 BOUNDARY SURVEY
 PROVIDED BY
 PRIVETT-NILES AND
 ASSOCIATES, INC.

PARCEL A
 BOUNDARY SURVEY
 PROVIDED BY
 PRIVETT-NILES AND
 ASSOCIATES, INC.

LESS OUT



JOHN ANDERSON HIGHWAY - STR. R/W 100' (100' R/W)



POINT OF BEGINNING

POINT OF COMMENCEMENT
 SOUTHWEST CORNER
 OF SECTION 11, TOWNSHIP 12
 SOUTH, RANGE 31 EAST.

SOUTHERLY LINE OF SECTION 11

LESS OUT
 SHEET 2 OF 2
 SEE SHEET 1 OF 2 FOR DESCRIPTION

ABBREVIATIONS:
 R/W - RIGHT OF WAY

DATE: 08/23/2005	REVISED:
SCALE: 1"=300'	
APPROVED BY: SMP	
JOB NO.:	
DRAWN BY: AG	



AMERICAN SURVEYING & MAPPING
 CERTIFICATION OF AUTHORIZATION NUMBER LB78393
 1030 N. ORLANDO AVENUE, SUITE B
 WINTER PARK, FLORIDA 32789
 (407) 426-7879

DESCRIPTION:

LESS OUT

A PARCEL OF LAND IN SECTION 12, TOWNSHIP 12 SOUTH, RANGE 31 EAST, FLAGLER COUNTY, FLORIDA MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGIN AT THE SOUTHWEST CORNER OF SAID GOVERNMENT SECTION 12, THENCE DEPARTING SAID SOUTHERLY LINE NORTH 01°30'23" WEST A DISTANCE OF 1203.23 FEET ALONG THE WESTERLY LINE OF SAID SECTION 12; THENCE NORTH 88°52'15" EAST, A DISTANCE OF 649.96 FEET; THENCE SOUTH 19°00'52" EAST, A DISTANCE OF 1,265.64 FEET; THENCE SOUTH 88°56'30" WEST, ALONG SAID SECTION LINE, A DISTANCE OF 1,030.73 FEET TO THE POINT OF BEGINNING.

CONTAINING 23.22 ACRES (1,011,514 SQUARE FEET), MORE OR LESS.

DOCUMENT

In accordance with CH-61617-6 of the Florida Administrative Code, this Description and Sketch of Description bears the notation:

~~THIS IS NOT A SURVEY~~

HAMMOCK BEACH RIVER CLUB
LESS OUT
SHEET 1 OF 2
SEE SHEET 2 OF 2 FOR SKETCH

THE BEARING SHOWN HEREON ARE BASED ON THE WESTERLY LINE OF SECTION 12; TOWNSHIP 12 SOUTH, RANGE 31 EAST; FLAGLER COUNTY, FLORIDA. AS BEING NORTH 01°30'23" WEST, ASSUMED.

SKETCH OF DESCRIPTION

HAMMOCK BEACH RIVER CLUB
LESS OUT

FLAGLER COUNTY, FLORIDA SECTION 12-12-31

DATE: 08/25/05
SCALE: 1"=300'
APPROVED BY: SMP
JOB NO.
DRAWN BY: AG

REVISED:



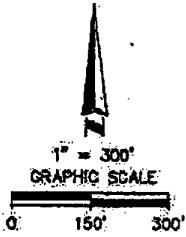
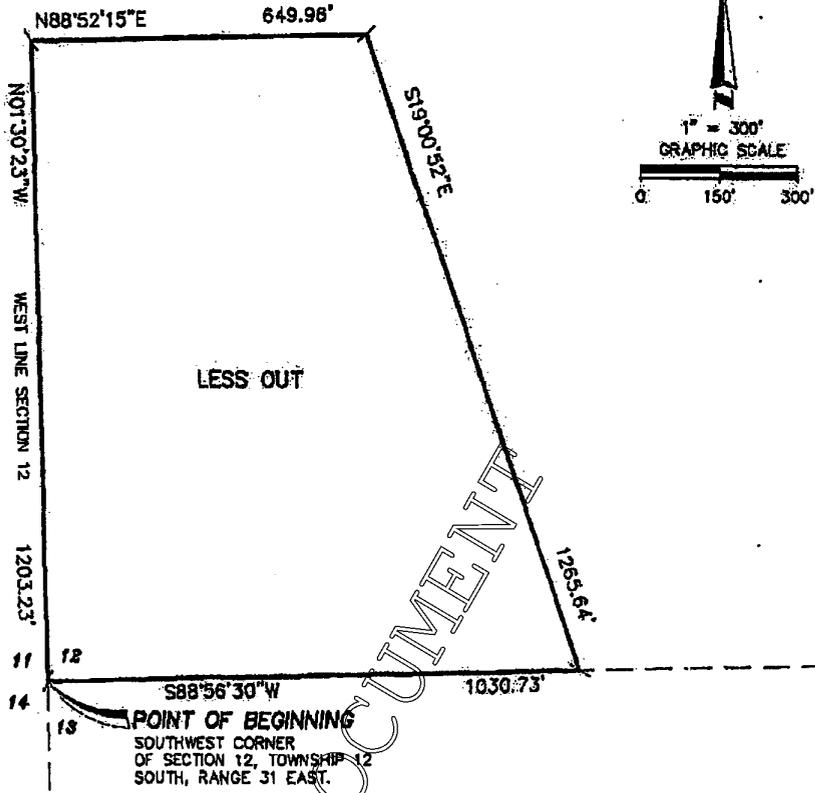
AMERICAN SURVEYING & MAPPING
CERTIFICATION OF AUTHORIZATION NUMBER LG/6383
1030 N. ORLANDO AVENUE, SUITE B
WINTER PARK, FLORIDA 32789
32801 (407) 425-7879

1. THE SURVEYOR HAS NOT ABSTRACTED THE LAND SHOWN HEREON FOR EASEMENTS, RIGHT OF WAY, RESTRICTIONS OF RECORD WHICH MAY AFFECT THE TITLE OR USE OF THE LAND
2. NO UNDERGROUND IMPROVEMENTS HAVE BEEN LOCATED EXCEPT AS SHOWN.
3. NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.


BRETT A. MOSCOVITZ PSM #3011
DATE: 08/25/05

SKETCH OF DESCRIPTION:

FLAGLER BEACH
WASTE WATER
TREATMENT PLANT



UNOFFICIAL DOCUMENT

LESS OUT
SHEET 2 OF 2
SEE SHEET 1 OF 2 FOR DESCRIPTION

DATE: 08/25/2005
SCALE: 1" = 300'
APPROVED BY: SMP
JOB NO.
DRAWN BY: AG

REVISED:

AMERICAN SURVEYING & MAPPING
CERTIFICATION OF AUTHORIZATION NUMBER LB#8393
1030 N. ORLANDO AVENUE, SUITE B
WINTER PARK, FLORIDA 32789
(407) 422-7878

Exhibit "C"

Description of System Looping

UNOFFICIAL DOCUMENT

**THE GARDENS
AT HAMMOCK BEACH**

DEVELOPMENT PROGRAM

PARCEL	UNIT TYPE	# OF LOTS	LOT SIZE
P-10	Condominium Units	30	1,000 S.F.
P-11	Condominium Units	30	1,000 S.F.
P-12	Condominium Units	30	1,000 S.F.
P-13	Condominium Units	30	1,000 S.F.
P-14	Condominium Units	30	1,000 S.F.
P-15	Condominium Units	30	1,000 S.F.
P-16	Condominium Units	30	1,000 S.F.
P-17	Condominium Units	30	1,000 S.F.
P-18	Condominium Units	30	1,000 S.F.
P-19	Condominium Units	30	1,000 S.F.
P-20	Condominium Units	30	1,000 S.F.
P-21	Condominium Units	30	1,000 S.F.
P-22	Condominium Units	30	1,000 S.F.
P-23	Condominium Units	30	1,000 S.F.
P-24	Condominium Units	30	1,000 S.F.
P-25	Condominium Units	30	1,000 S.F.
P-26	Condominium Units	30	1,000 S.F.
P-27	Condominium Units	30	1,000 S.F.
P-28	Condominium Units	30	1,000 S.F.
P-29	Condominium Units	30	1,000 S.F.
P-30	Condominium Units	30	1,000 S.F.
P-31	Condominium Units	30	1,000 S.F.
P-32	Condominium Units	30	1,000 S.F.
P-33	Condominium Units	30	1,000 S.F.
P-34	Condominium Units	30	1,000 S.F.
P-35	Condominium Units	30	1,000 S.F.
P-36	Condominium Units	30	1,000 S.F.
P-37	Condominium Units	30	1,000 S.F.
P-38	Condominium Units	30	1,000 S.F.
P-39	Condominium Units	30	1,000 S.F.
P-40	Condominium Units	30	1,000 S.F.
P-41	Condominium Units	30	1,000 S.F.
P-42	Condominium Units	30	1,000 S.F.
P-43	Condominium Units	30	1,000 S.F.
P-44	Condominium Units	30	1,000 S.F.
P-45	Condominium Units	30	1,000 S.F.
P-46	Condominium Units	30	1,000 S.F.
P-47	Condominium Units	30	1,000 S.F.
P-48	Condominium Units	30	1,000 S.F.
P-49	Condominium Units	30	1,000 S.F.
P-50	Condominium Units	30	1,000 S.F.
P-51	Condominium Units	30	1,000 S.F.
P-52	Condominium Units	30	1,000 S.F.
P-53	Condominium Units	30	1,000 S.F.
P-54	Condominium Units	30	1,000 S.F.
P-55	Condominium Units	30	1,000 S.F.
P-56	Condominium Units	30	1,000 S.F.
P-57	Condominium Units	30	1,000 S.F.
P-58	Condominium Units	30	1,000 S.F.
P-59	Condominium Units	30	1,000 S.F.
P-60	Condominium Units	30	1,000 S.F.
P-61	Condominium Units	30	1,000 S.F.
P-62	Condominium Units	30	1,000 S.F.
P-63	Condominium Units	30	1,000 S.F.
P-64	Condominium Units	30	1,000 S.F.
P-65	Condominium Units	30	1,000 S.F.
P-66	Condominium Units	30	1,000 S.F.
P-67	Condominium Units	30	1,000 S.F.
P-68	Condominium Units	30	1,000 S.F.
P-69	Condominium Units	30	1,000 S.F.
P-70	Condominium Units	30	1,000 S.F.
P-71	Condominium Units	30	1,000 S.F.
P-72	Condominium Units	30	1,000 S.F.
P-73	Condominium Units	30	1,000 S.F.
P-74	Condominium Units	30	1,000 S.F.
P-75	Condominium Units	30	1,000 S.F.
P-76	Condominium Units	30	1,000 S.F.
P-77	Condominium Units	30	1,000 S.F.
P-78	Condominium Units	30	1,000 S.F.
P-79	Condominium Units	30	1,000 S.F.
P-80	Condominium Units	30	1,000 S.F.
P-81	Condominium Units	30	1,000 S.F.
P-82	Condominium Units	30	1,000 S.F.
P-83	Condominium Units	30	1,000 S.F.
P-84	Condominium Units	30	1,000 S.F.
P-85	Condominium Units	30	1,000 S.F.
P-86	Condominium Units	30	1,000 S.F.
P-87	Condominium Units	30	1,000 S.F.
P-88	Condominium Units	30	1,000 S.F.
P-89	Condominium Units	30	1,000 S.F.
P-90	Condominium Units	30	1,000 S.F.
P-91	Condominium Units	30	1,000 S.F.
P-92	Condominium Units	30	1,000 S.F.
P-93	Condominium Units	30	1,000 S.F.
P-94	Condominium Units	30	1,000 S.F.
P-95	Condominium Units	30	1,000 S.F.
P-96	Condominium Units	30	1,000 S.F.
P-97	Condominium Units	30	1,000 S.F.
P-98	Condominium Units	30	1,000 S.F.
P-99	Condominium Units	30	1,000 S.F.
P-100	Condominium Units	30	1,000 S.F.
Total:			40



ILLUSTRATIVE MASTER PLAN

Ginn

November 10, 2006



- A - BULK WATER SERVICE POINT w/ METER
- B - BULK WATER SERVICE POINT w/ METER
- C - BULK WASTEWATER SERVICE POINT w/ METER

Exhibit "D"
Flagler Beach Rates

Water

Current Flagler Beach rates charged customers within the City are as follows:

Base Facility Charge: \$4.57 per ERC

Gallage Charge (per 1000 gallons):

<u>Gallage</u>	<u>Rate</u>
0 - 2,000	\$3.44
2,001 - 8,000	5.36
over 8,000	6.49

Wastewater

Base Facility Charge: \$7.60 per ERC

Gallage Charge (per 1000 gallons): \$5.36

By the 15th day of each month during the term of this Agreement the County shall provide to Flagler Beach a report identifying the number of ERC's to which the County provided service on the first and last day of the preceding month within the John Anderson Corridor (including within the PUD Property). Flagler Beach will then divide the number of gallons of Wholesale Capacity provided the County during the month by the average number of ERCs served during the month to determine the per ERC usage during that month. Flagler Beach will then apply the appropriate rate block for such usage for each ERC to determine the volumetric charge for the month. To this Flagler Beach will add the base facility charge for each ERC to determine the total monthly bill.

UNOFFICIAL COMMENT

IN THE CIRCUIT COURT OF THE SEVENTH JUDICIAL CIRCUIT IN AND
FOR FLAGLER COUNTY, FLORIDA

CITY OF FLAGLER BEACH,
a municipal corporation of the
State of Florida, and
CITY OF PALM COAST, a municipal
corporation of the State of Florida

Plaintiff,

CASE NO.: 06-001531CA

v.

HAMMOCK BEACH RIVER CLUB PROPERTY
OWNERS' ASSOCIATION, INC., n/k/a
THE GARDENS AT HAMMOCK BEACH
PROPERTY OWNERS' ASSOCIATION, INC.,
a Florida Non-Profit Corporation, and
FLAGLER COUNTY, a Political subdivision
of the State of Florida

Defendants.

**AGREED ORDER ADDING FLAGLER COUNTY AS PARTY AND THE CITY OF
PALM COAST AS FULL PARTY, APPROVING SETTLEMENT AGREEMENT, AND
DISMISSING ACTION WITH PREJUDICE**

THIS CAUSE having come before the Court on the Unopposed Joint Motion for
Entry of Order Adding Flagler County as Party and the City of Palm Coast as a Full
Party, Approving Settlement Agreement, and Dismissing Action With Prejudice (the
"Motion") and the Court, having considered the Motion and the pleadings and papers
constituting the record in this matter to include the Settlement Agreement (the
"Agreement"), and being otherwise fully advised in the premises, it is thereupon;

CONSIDERED, ORDERED AND ADJUDGED as follows:

1. The Motion is hereby **GRANTED**.

UNOFFICIAL DOCUMENT

5538

2. FLAGLER COUNTY is hereby added as a Party-Defendant in this case and the Intervenor, CITY OF PALM COAST, is hereby added as a Party-Plaintiff in this case.

3. The Agreement is declared to be: a judicially enforceable interlocal agreement under the provisions of Section 163.01, *Florida Statutes*, (the "Florida Interlocal Cooperation Act of 1969"); a judicially enforceable joint planning agreement entered under the provisions of Part II, Chapter 163, *Florida Statutes*; as well as a judicially enforceable agreement entered under the home rule powers of the parties as set forth in Article VIII of the *Constitution of the State of Florida* and Chapters 125 and 166, *Florida Statutes*; and the Agreement is hereby adopted as an order of this Court.

4. This action is hereby dismissed with prejudice, with all Parties to bear their own attorneys' fees and costs.

5. Notwithstanding the dismissal of this action with prejudice, each Party has the right to seek enforcement of the Agreement, and accordingly, the Court retains jurisdiction to enforce the Agreement.

DONE AND ORDERED at Flagler County, Florida this 5 day of Feb., 2007.

[Handwritten signature]
Raul A. Zambrano
Circuit Judge
FLAGLER COUNTY, FLORIDA

UNOFFICIAL

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing has been furnished by U.S. mail to Daren L. Shippy, Esquire, John R. Jenkins, Esquire, Rose Sundstrom & Bentley, 2548 Blairstone Pines Drive, Tallahassee, FL 32301; Charles J. B. Cino., Esquire, Charles J.B. Cino, P.A., 555 W. Granada Blvd., Suite E12, Ormond Beach, FL 32174; Phillip C. Gildan, Esquire, Susan F. Kornspan, Esquire, Greenberg Traurig, P.A., 777 S. Flagler Drive, Suite 300 East, West Palm Beach, FL 33401-6167; Reginald Luc Bouthillier, Jr., Esquire, Greenberg Traurig, P.A. 101 E. College Ave., Tallahassee, FL 32301; Carl E. Kern, III, Esquire, County Attorney, Flagler County, 1200 E. Moody Blvd., #1, Bunnell, FL 32110; and Lonnie Groot, Esquire, City of Palm Coast, 2 Commerce Blvd., Palm Coast, FL 32164; Jacob D. Varn, Esquire, Fowler White, P.O. Box 11240, Tallahassee, FL 32302-3240 on this _____ day of _____, 2007.

JUDICIAL ASSISTANT

UNOFFICIAL

DOCUMENT

**Appendix B Excerpts from Volusia County and
City of Ormond Beach adopted
Water Supply Facilities Work Plans**

1. Volusia County Utilities Northeast Water Supply Planning Area

The Northeast water supply planning area, shown in **Figure II-2**, is situated within the northeast corner of the County. Service is provided to two large, primarily single family developments known as Halifax Plantation and Plantation Oaks, along with several smaller residential developments. These developments are located along the west side of the water supply planning area between I-95 and Old Dixie Highway. A portion of the water supply planning area that includes these developments is located within Flagler County. An interlocal agreement exists with Flagler to allow service by the County within the Flagler County portion of the water supply planning area (See **Table II-3**).

2. Volusia County Utilities Spruce Creek Water Supply Planning Area

The Spruce Creek water supply planning area, shown in **Figure II-3**, is comprised entirely of the Spruce Creek Fly-in community that commenced development in the 1970's. This development consists of single family residences and is located within the unincorporated area on the west side of the municipal limits of the City of Port Orange. There are 419 vacant lots that remain to be developed within this community which will connect to the Spruce Creek system.

3. Volusia County Utilities Southeast Water Supply Planning Area

The Southeast water supply planning area, shown in **Figure II-4**, is located on the west side of the Indian River Lagoon in the southeast area of the County. The water supply planning area includes the entire City of Oak Hill and a small portion of the City of Edgewater. The County has previously executed interlocal agreements with the cities of Edgewater and Oak Hill, which delineate the respective service delivery arrangements (See **Table II-3**).

4. Volusia County Utilities Northwest Water Supply Planning Area

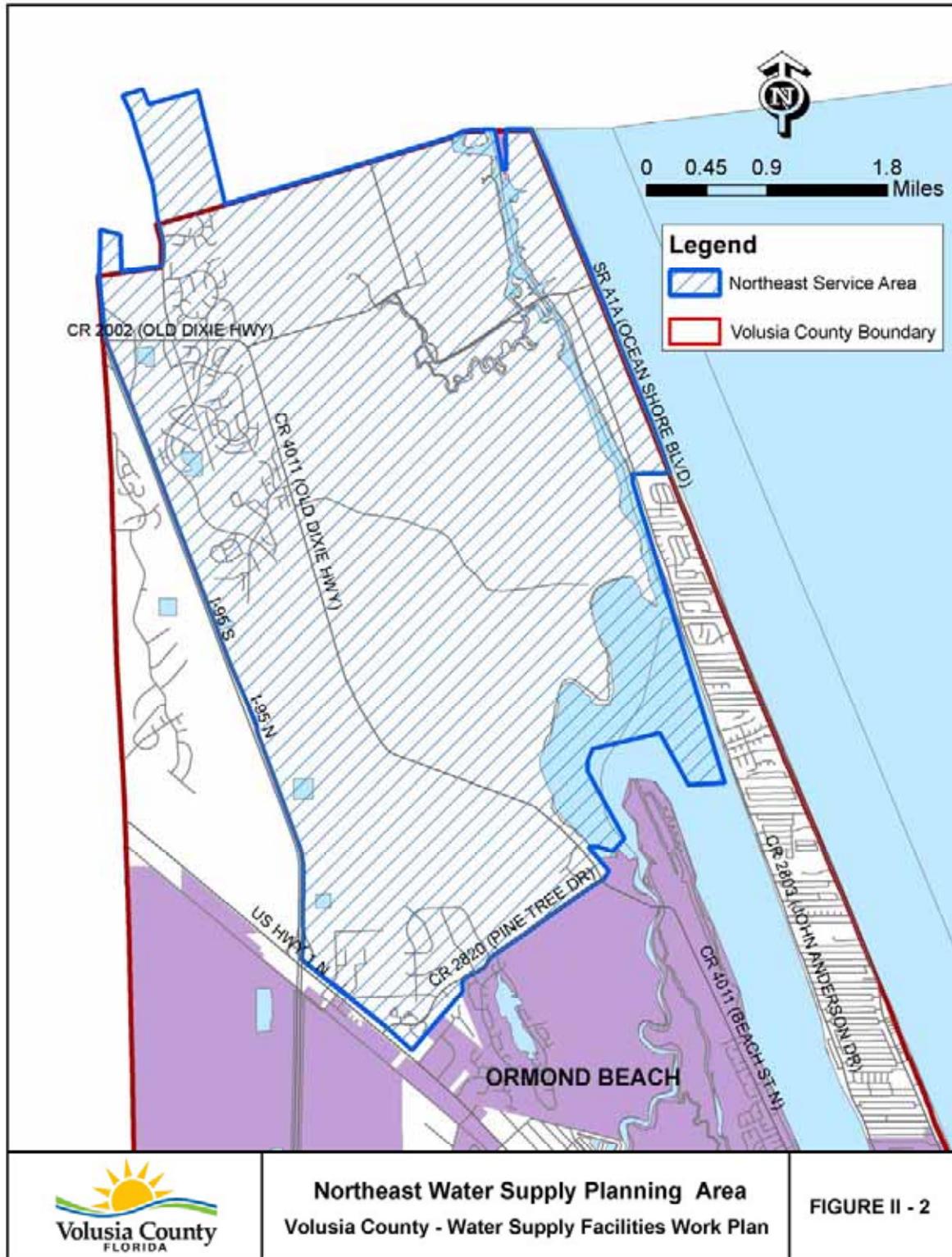
The County owns and operates two separate systems in the northwest area of the County (see **Figure II-5**), which serve two small rural residential developments known as Pine Island and New Hope Villas. The well fields for these two systems fall under the thresholds for requiring a Consumptive Use Permit (CUP). An inventory of the system components is included in Section III of this Work Plan. Due to the small size of these two systems, and because the system components are adequate to meet the needs of these two communities, water supply availability is not addressed.

5. Volusia County Utilities Southwest Water Supply Planning Area

The Southwest water supply planning area, shown in **Figure II-6**, serves the City of DeBary along with some unincorporated area. This system was formerly private and known as West Volusia Utilities prior to its acquisition by the County, which occurred in 1986 before the City of DeBary was incorporated. This system also provides potable water service within a portion of Orange City through an interlocal agreement with the City that was executed in 1989 (See **Table II-3**).

This system contains the largest customer base of all the County's water supply planning areas. The Southwest water supply planning area contains 53% of the total potable water connections within the County's system. Service is provided primarily to single family residential land uses with some commercial service provided along the US 17-92 corridor in the vicinity of DeBary.

Figure II-2: Northeast Water Supply Planning Area



III. Existing Volusia County Water System Facilities

The existing Volusia County potable water system includes water supply, treatment, and storage facilities, located throughout the County in one of its seven water supply planning areas that were described in Section II. In addition, the County provides treated wastewater effluent (reclaimed water) in lieu of potable water for irrigation use. A summary of the County's potable water system and reclaimed water facilities is presented in this section.

A. Water Supply Facilities

The County's seven water supply planning areas are comprised of independent systems that are not interconnected with any other County system. However, each County water supply planning area provides emergency interconnects with other utility systems. These interconnects are normally closed and are only opened in coordination with the other utility systems in emergency situations when water supplies need to be shared. Groundwater from the Floridan aquifer provides the water supply source for five of the seven County water supply planning areas, which utilize wells to produce the water. The remaining water supply planning areas receive their water supply through a wholesale supply arrangement with another utility provider. The following sub-sections describe the water supply facilities and permitted water uses for each County water supply planning area.

1. Northeast Water Supply Planning Area

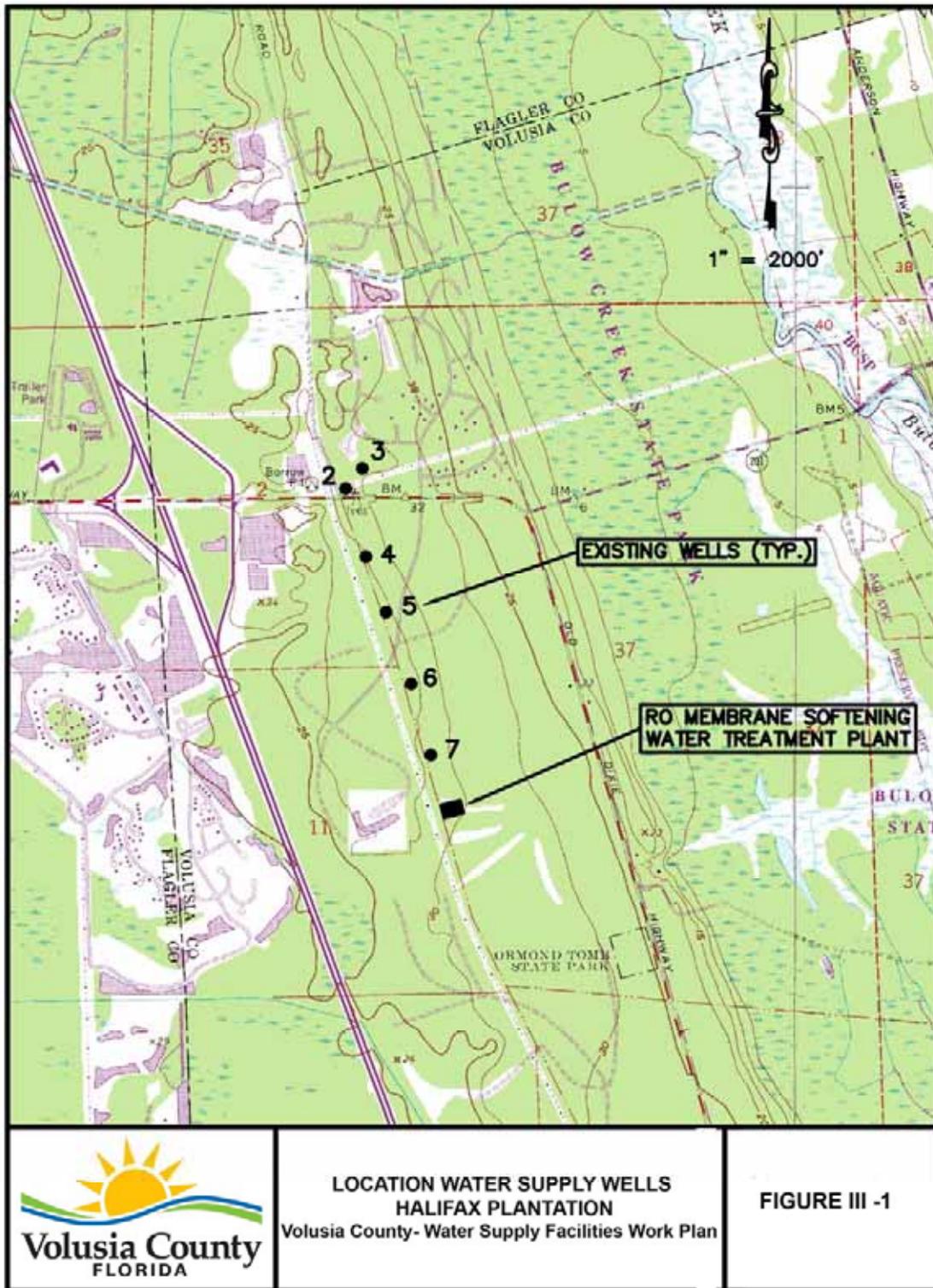
The County owns and operates the Halifax Plantation wellfield to serve County customers in the Northeast water supply planning area. The existing wells for the Halifax Plantation wellfield are summarized in **Table III-1** and the general locations of the wells are shown in **Figure III-1**. Halifax Plantation has a total of seven wells, with individual production capacities ranging from 84 to 135 gpm each.

Table III- 1: Northeast Water Supply Planning Area Water Supply Wells

Location	CUP #	State ID #	Well Name	Total Depth	Casing Depth	Casing Diameter	Horsepower	Yield (gpm)
Halifax Plantation	50157	3644123	1	180'	118'	6"	7.5	135
	50157	3644123	2	180'	126'	6"	7.5	135
	50157	3644123	3	150'	110'	6"	7.5	84
	50157	3644123	4	180'	118'	6"	7.5	135
	50157	3644123	5	180'	122'	6"	7.5	135
	50157	3644123	6	180'	110'	6"	7.5	135
	50157	3644123	7	180'	110'	6"	7.5	135

Source: Volusia County Water and Utility Services

Figure III-1: Location Water Supply Wells Halifax Plantation



The CUP for groundwater withdrawals for Halifax Plantation was approved by the SJRWMD in February 2006. The CUP provides maximum allowable withdrawals on an annual basis for the years 2006 through 2021. According to the CUP, the maximum allowable withdrawal increases annually through 2010. However, after 2010 there is no increase in the allowable CUP allocation, which remains constant at 254.4 million gallons per year through 2021. The CUP withdrawals for Halifax Plantation are summarized in **Table III-2**. The County is currently pursuing an individual consumptive use permit for the Northeast water supply planning area such that the permitted withdrawal is increased to 0.75 mgd on an average daily basis. The purpose of the request is to shift the source for a portion of the groundwater allocation from the upper Floridan aquifer to the surficial aquifer, which has better water quality. The County intends to blend these two sources. This request has the added benefits of reducing the concentrate by-product and costs associated with the reverse osmosis treatment process for water pumped from the upper Floridan aquifer.

During 2007, this plant produced 102.859 million gallons of treated potable water and distributed it to 1,853 metered customers. The annual average flow was approximately 282,000 gallons per day. The plant capacity is adequate for existing flows.

Table III- 2: Permitted Water Use - Northeast Water Supply Planning Area

Year	Annual Permitted Withdrawal (mgy)	Max. Daily Permitted Withdrawal (mgd)
2007	225.2	1.01
2008	237.3	1.07
2009	245.6	1.10
2010 through 2021	254.4	1.14

Source: County CUP (Note: The CUP refers to this water supply planning area as "Halifax Plantation")

2. **Spruce Creek Water Supply Planning Area**

The County owns and operates the Spruce Creek wellfield to serve County customers in the Spruce Creek water supply planning area. These existing Spruce Creek water supply wells are summarized in **Table III-3**, and the general locations of these wells are shown in **Figure III-2**. Spruce Creek has three water supply wells with a capacity range of 200 to 420 gpm.

Table III- 3: Spruce Creek Water Supply Planning Area Water Supply Wells

Location	CUP #	State ID	Well Name	Total Depth	Casing Depth	Casing Diameter	Horsepower	Yield (GPM)
Spruce Creek	50157	3640412	1	300	80	12	25	420
Spruce Creek	50157	3640412	2	200	95	8	20	200
Spruce Creek	50157	3640412	3	200	74	12	25	420

Source: Volusia County Water and Utility Services

The CUP for groundwater withdrawals was approved by the SJRWMD in February 2006. The permit provides maximum allowable annual withdrawals from 2006 through 2021. The permitted withdrawals for Spruce Creek are included in **Table III-4**.

IV. Historic & Projected Water Consumption

This section of the Work Plan reviews the historic water use and the projected potable water demand through 2025 for the County's five major water supply planning areas. The following subsections discuss the methodology used in this Work Plan to project the potable water demand and describe the historic usage and projected demand for each water supply planning area. The projected water demands are used in Section V to address water supply availability and the facilities needed to meet the projected demand.

A. Methodology

To project potable water demand for each of the water supply planning areas, the historic monthly average daily use per connection was calculated for the five-year period 2003 through 2007. The monthly historic average daily use per connection was derived by comparing the monthly number of connections with the monthly recorded usage for potable water. The monthly historic average use per connection was then averaged for the five-years to estimate an average daily use for projecting water demand through the 2025 planning horizon. The maximum daily use for each month was compared to the total average daily use so that a ratio of maximum daily use to average daily use could be calculated. The ratio of maximum daily use to average daily use was used to calculate the maximum daily use for each connection.

Table IV-1 provides a comparison of the per connection demand factors used in this Work Plan to project future demand with the historic per connection demand factor and the Level of Service (LOS) standards established in the Comprehensive Plan for each of the five major water supply planning areas. As seen in the table, the historic water use for the Northeast, Spruce Creek, and Southeast water supply planning areas was below the Comprehensive Plan LOS standard, while the historic water use for the Southwest and Deltona North water supply planning areas exceeded the Comprehensive Plan LOS standard.

Table IV - 1: Historic Demand and LOS Standard

Water Supply Planning Area	Historic Demand Factor Per Residential Connection (GPD/ERU*)	Persons Per Household	Historic Per Capita Usage (GPD)	LOS Standard Comprehensive Plan (GPD/ERU*)	Demand Factor Per Residential Connection Used for Projecting Water Demands (GPD/ERU*)
Deltona North	449	3.20	140	300	450
Southwest	360	2.50	144	300	365
Northeast	149	2.50	80	200	200
Spruce Creek	191	2.32	82	200	200
Southeast	170	2.00	85	200	200

*ERU = Equivalent Residential Unit; GPD = Gallons per Day

Source: Volusia County Comprehensive Plan; Volusia County Water and Utilities Services

As shown in **Table IV-1**, the potable water LOS standard established in the Comprehensive Plan for the Deltona North and Southwest water supply planning areas is 300 gallons per day (GPD), as opposed to 200 GPD for the Northeast, Spruce Creek and Southeast water supply planning areas. The relatively high historic per connection usage for these two water supply planning areas as compared to the other three water supply planning areas is attributed to landscape irrigation resulting primarily from the newer subdivisions in these water supply planning areas. However, this Work Plan takes into account reduction of water demand over time through various programs such as implementing the waterwise irrigation ordinance and increasing the provision of reuse. These factors are discussed further in **Section V** of this Work Plan.

The increase in new connections through 2025 is based on the projected population growth within each County water supply planning area (see **Table IV-2**). The population projections were derived from the Volusia County MPO Five-Year *Long Range Transportation Plan* (LRTP) that was updated in 2005. The MPO population projections are based on the mid-range Florida Bureau of Economic and Business Research (BEBR). These population projections are considered the best available data since the projections are spatially distributed by Traffic Analysis Zone (TAZ) and allow for the conversion of the population data to water supply planning areas. Further, the MPO coordinated the spatial distribution at the TAZ level with the planning staff of the local governments within the County.

The MPO population projections are the ones that were used in the County's Evaluation and Appraisal Report (EAR), which was found sufficient by DCA in October 2006. The sufficiency review of the County's EAR included the opportunity for comments from the applicable state and regional reviewing agencies; however, none made any objections to the use of these projections. Further, the County's Comprehensive Plan requires that population projections used to justify amendments be consistent with the LRTP projections.

Table IV - 2: Population Projection for Primary Water Supply Planning Areas

Year	Northeast	Spruce Creek	Southeast	Southwest	Deltona North	TOTAL
2008	4,053	3,233	3,104	22,250	8,883	41,523
2010	4,256	3,459	3,163	22,792	9,427	43,097
2015	4,766	4,024	3,308	24,149	10,785	47,032
2020	5,275	4,590	3,454	25,505	12,144	50,968
2025	5,784	5,155	3,600	26,861	13,503	54,903

Source: 2005 Volusia County MPO Long-Range Transportation Plan; Volusia County EAR

A comparison is shown between the County's population projections for each of the water supply planning areas and the population projections used in the Water Authority of Volusia (WAV) Master Plan (see **Table IV-3**). The WAV Master Plan population projections were based on the population projections developed by Burton and Associates for SJRWMD (SJ2004-SP19). The County's projections result in a system-wide population increase of 14,167 or 34% over the 18-year period this Work Plan addresses, which equates to a 1.7% average annual rate of growth. The County's projections result in a smaller growth in population and water demand than the projections used in the WAV Master Plan over the same period. This Work Plan is based on the MPO population projections and the County's Utility engineering staff demand projections for several key reasons:

- The population projections are the same as used in the recent update to the County's Comprehensive based on its EAR, and reflect a slowing rate of growth as indicated in more recent BEBR projections;
- The demand projections are based on more recent water usage data (through 2007) and a more refined, specific analysis by water supply planning area conducted by the County's utility engineering staff; and
- The County's projections reflect a significant reduction in water demand for the Southwest Activity Center project than the projected demand used in the WAV Master Plan (0.31 mgd vs. 1.72 mgd).

Table IV - 3: Projected Population and Water Demand - Volusia County Water Supply Planning Areas

Year	Volusia County Work Plan		WAV Master Plan	
	Population	Water Demand (mgd*)	Population	Water Demand (mgd*)
2010	43,097	4.55	38,895	7.12
2015	47,032	5.06	46,844	8.94
2020	50,968	5.56	53,509	10.68
2025	54,903	6.02	59,326	12.08

*mgd – Millions of Gallons per Day

Source: Volusia County EAR; Volusia County Water and Utilities Services; and WAV Master Plan

B. Projected Water Demand

The projected water demand for each of the County's five major water supply planning areas is presented in the following sub-sections. Each sub-section includes a summary of the historic water use over the past five years and projected water demands through 2025.

1. Northeast Water Supply Planning Area

Table IV-4 provides the historic and projected potable water usage for this water supply planning area. The average daily demand per connection for the previous five-years was 149 GPD; however, a conservative average daily use of 200 GPD per connection based on the adopted level of service (LOS) standard was used to project demand for future years. The projections assume that 46 new connections will be added to the system on an annual basis for the years 2008 through 2025. The number of connections is based a population growth of 115 people per year through this period, divided by an average of 2.5 persons per household. To remain conservative in projecting demand, the projected increase in connections assumes that all of the new population growth in this water supply planning area will connect to the County's system.

Table IV - 4: Projected Water Demand for Northeast Water Supply Planning Area

Year	Number of Conn.	Increase in Conn.	Average Daily Use (GPD)	Maximum Daily Use (GPD)	Average Daily Use Per Conn. (GPD)	Ratio Average/Max. Day
2003	1,468	101	190,746	-----	134	-----
2004	1,620	152	193,614	291,467	130	1.31
2005	1,787	167	262,538	307,942	153	1.17
2006	1,828	41	315,341	416,150	173	1.33
2007	1,839	11	281,665	364,675	153	1.30
2008	1,878	43	352,343	528,515	200	1.50
2010	1,970	46	389,846	584,768	200	1.50
2015	2,200	46	435,841	653,762	200	1.50
2020	2,430	46	481,841	722,762	200	1.50
2025	2,664	46	527,841	791,761	200	1.50

Source: Volusia County Water and Utilities Services (*italicized text is historical data*)

2. Spruce Creek Water Supply Planning Area

Table IV-5 provides the historic and projected potable water usage for this water supply planning area. The average daily demand per connection for the previous five-years was 200 GPD which was used to project demand for future years. The projections assume that from 28 to 33 new connections will be added to the system on an annual basis for the years 2008 through 2025. The number of connections is based on a population growth of 65 to 77 people per year through this period, divided by an average of 2.32 persons per household. There are 419 lots remaining in this subdivision to be connected to the County's system. At the projected rate of growth, it is anticipated that all lots in this subdivision will be connected by the year 2020.

Table IV - 5: Projected Water Demand for Spruce Creek Water Supply Planning Area

Year	Number of Conn.	Increase in Conn.	Average Daily Use per Conn. (GPD)	Average Daily Use (GPD)	Monthly Max. Daily Use (GPD)	Ratio Average/Max. Day
2003	1,429	8	351,731	-----	246	-----
2004	1,442	13	223,918	278,007	156	1.32
2005	1,416	-26	220,354	296,183	154	1.34
2006	1,427	11	277,630	372,571	195	1.34
2007	1,431	4	290,007	363,348	203	1.25
2008	1,458	28	273,500	358,771	200	1.30
2010	1,523	33	301,627	392,115	200	1.30
2015	1,685	32	334,038	434,249	200	1.30
2020	1,850	33	366,983	477,078	200	1.30
2025	1,850	0	366,983	477,078	200	1.30

Source: Volusia County Water and Utilities Services (*italicized text is historical data*)

V. Demand and Capacity Analysis

Based on the County's existing water system configuration and projected water demands and levels of service presented in **Section IV** of this Work Plan, three of the County's five potable water supply planning areas that require a CUP will not experience a need for alternative water supplies and will continue to use groundwater from County water supply wells exclusively for its water supply. These planning areas are the Southeast, Northeast and the Spruce Creek water supply planning areas. The Southwest and Deltona North water supply planning areas will experience a need for alternative water supplies within this planning horizon.

A. Northeast Water Supply Planning Area

A summary of the projected water demands, well supply capacity, treatment plant capacity, and CUP water use allocations for the Northeast water supply planning area is presented in **Table V-1**. As indicated by the data, the Northeast water supply planning area treatment facilities will experience a treatment capacity deficit by 2009. To ensure that the projected maximum daily water demands can be met, the treatment capacity must be equal to or greater than the maximum daily water demand. Currently, the County has an on-going expansion project for the Northeast water supply planning area water treatment facilities in which the Halifax Plantation water plant will be expanded to 1.5 mgd. This expansion project should be complete by 2010.

Table V- 1: Northeast Water Supply Planning Area - Comparison of Water Demand, Well Capacity, Plant Capacity, and CUP Allocation

Year	Projected Finished Water Demand (1) (mil.gal/yr)	Projected Avg. Daily Demand (1) (mgd)	Projected Max. Daily Demand (1) (mgd)	Well Supply Capacity (mgd)	Treatment Plant Capacity (mgd)	Water Use Allowed Per CUP (mil.gal/yr)
2008	169.59	0.465	0.697	1.09	0.750	237.3
2009	183.57	0.503	0.754	1.09	0.750	245.6
2010	187.90	0.515	0.772	1.09	1.50	254.4
2011	192.24	0.527	0.790	1.09	1.50	254.4
2012	196.57	0.539	0.808	1.09	1.50	254.4
2013	200.91	0.550	0.826	1.09	1.50	254.4
2014	205.73	0.564	0.845	1.09	1.50	254.4
2015	210.06	0.576	0.863	1.09	1.50	254.4
2016	214.40	0.587	0.881	1.09	1.50	254.4
2017	218.74	0.599	0.899	1.09	1.50	254.4
2018	223.07	0.611	0.917	1.09	1.50	254.4
2019	227.89	0.624	0.937	1.09	1.50	254.4
2020	232.23	0.636	0.954	1.09	1.50	254.4
2021	236.56	0.648	0.972	1.09	1.50	254.4
2022	240.90	0.660	0.990	1.09	1.50	254.4
2023	245.24	0.672	1.008	1.09	1.50	254.4
2024	250.05	0.685	1.028	1.09	1.50	254.4
2025	254.39	0.697	1.045	1.09	1.50	254.4

Note: 254.4 million gallons per year is equivalent to 0.697 mgd

(1) Demands adjusted to account for reject stream from RO process

Source: Volusia County Water and Utilities Services; SJRWMD

VI. Water Supply Needs and Source Assessment

Based on the projected water demands and the available water supplies, an assessment of the County's water needs and sources has been completed for this Work Plan for each of the County's five major water supply planning areas. For water supply planning area, a comparison was made between the projected water demands, the CUP allocations, and the actual capacity of the existing supply facilities. Where an alternative water supply need is identified, a water supply strategy consistent with the SJRWMD Water Supply Plan is presented. **Section VII** of this Work Plan describes the County's water supply strategy.

Each of the water supply planning areas includes a "water conservation offset," which is an allowance that is made to account for the potential water demand reduction related to the County's on-going conservation program described in **Section VII** of this Work Plan. An assumption is made that water demand will steadily decrease annually, due to the conservation program, in order to reach the County's target goal of a 10% reduction by 2020, and then remain at 10% thereafter.

A. Northeast, Spruce Creek and Southeast Water Supply Planning Areas Supply Assessment

The water supply needs and sources summary for the Northeast, Spruce Creek, and Southeast water supply planning areas are provided in **Table VI-1** through **Table VI-3** on the following pages. The adjusted water demands shown in each of these tables includes the water use reduction based on conservation strategies described in **Section VII**.

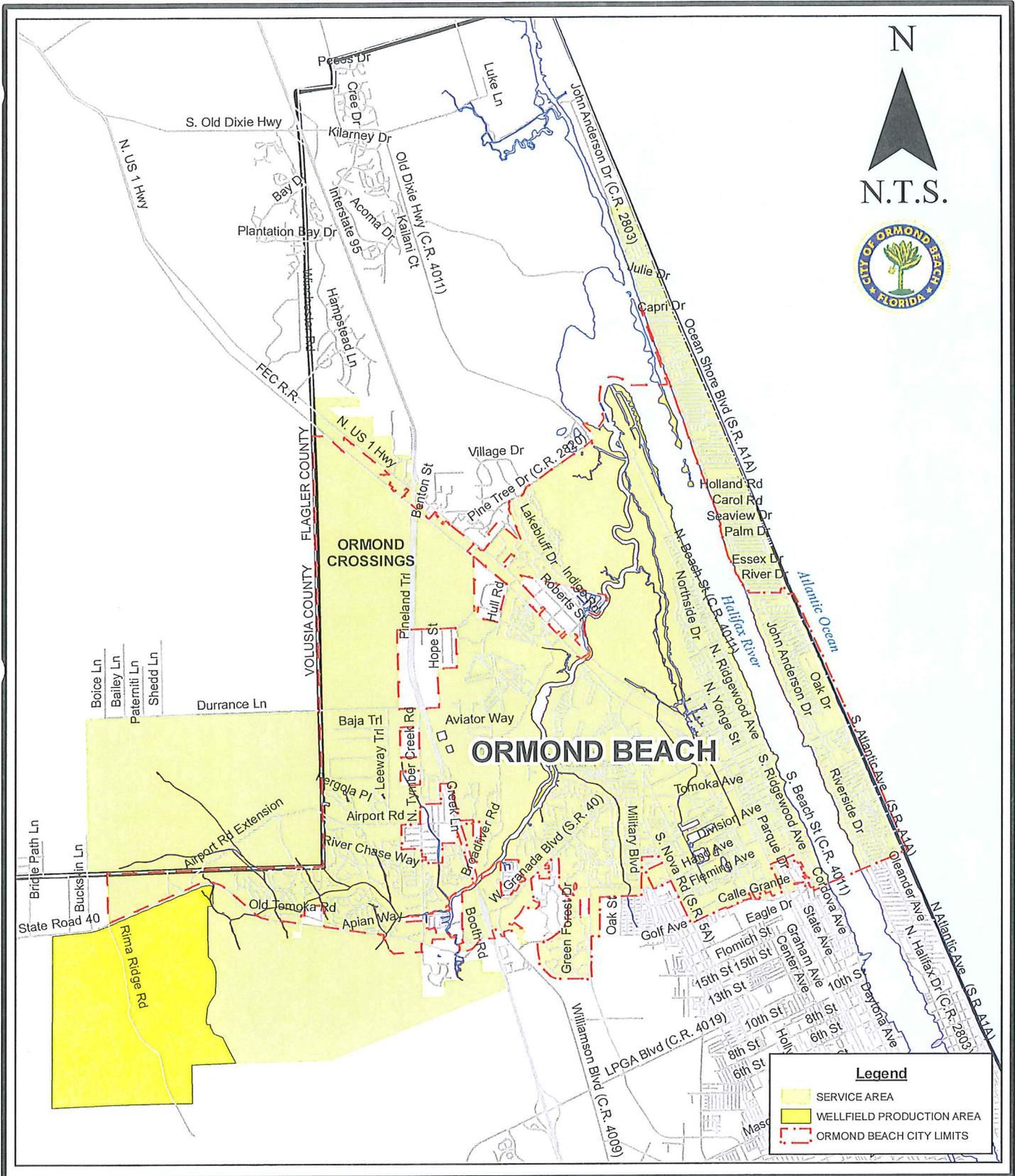
As shown in **Table V-1** and **Table V-2**, Volusia County will continue to utilize groundwater supplies as allocated under the CUP for the Northeast and Spruce Creek water supply planning areas. For the Southeast water supply planning area, as shown in the **Table V-3**, Volusia County will utilize existing groundwater supplies and wholesale purchase of City of Edgewater supplies to meet demands through 2025. It is projected that the adjusted total water demand will be less than the supply capacities and permitted water uses for each of these three water supply planning areas. Therefore, no additional water supply source improvements are required. The only improvements that will occur are those associated with the on-going expansion of the Northeast water supply planning area WTP (Halifax Plantation WTP).

Table VI-1: Needs and Sources Assessment for the Northeast Water Supply Planning Area

Year	Projected Total Demand (mgd)	Water Conservation Offset (1) (mgd)	Adjusted Total Demand (mgd)	Groundwater Sources/CUP Allocations (mgd)	Total Alternative Water Supply Required (mgd)
2008	0.465	0.004	0.461	0.650	0.000
2009	0.503	0.008	0.495	0.673	0.000
2010	0.515	0.012	0.503	0.697	0.000
2011	0.527	0.016	0.511	0.697	0.000
2012	0.539	0.021	0.518	0.697	0.000
2013	0.550	0.025	0.525	0.697	0.000
2014	0.564	0.030	0.534	0.697	0.000
2015	0.576	0.035	0.541	0.697	0.000
2016	0.587	0.041	0.546	0.697	0.000
2017	0.599	0.046	0.553	0.697	0.000
2018	0.611	0.052	0.559	0.697	0.000
2019	0.624	0.058	0.566	0.697	0.000
2020	0.636	0.064	0.572	0.697	0.000
2021	0.648	0.065	0.583	0.697	0.000
2022	0.660	0.066	0.594	0.697	0.000
2023	0.672	0.067	0.605	0.697	0.000
2024	0.685	0.069	0.617	0.697	0.000
2025	0.697	0.070	0.627	0.697	0.000

(1) Assumes conservation target of 10% water saving reached by year 2020, and then remain at 10% thereafter

Source: Volusia County and SJRWMD



City of Ormond Beach
 G.I.S. Department
 P.O. Box 277
 Ormond Beach, FL 32174
 August 28, 2008

CITY OF ORMOND BEACH WATER PLANNING SERVICE AREA

FIGURE 2.1-1
UTILITY SERVICE
AREA MAP

(2) Current Flow/Population Served/Per Capita Usage

Table 1-1 exhibits the average day, peak day, and peak month per year. Data was obtained from the Monthly Operating Reports of the City's Water Treatment Plant.

**Table 1-1
Average and Peak Raw Water Flows
City of Ormond Beach Service Area**

Year	Average Daily Flow (MGD)	Peak Day (MGD)	Average Day Peak Month (MGD)
1997	5.01	6.16	5.26
1998	5.02	6.93	6.24
1999	5.38	6.48	5.90
2000	5.70	6.74	6.18
2001	5.50	6.58	5.80
2002	5.56	7.05	6.23
2003	5.60	7.41	6.12
2004	5.87	8.35	6.35
2005	5.92	7.23	6.52
2006	6.25	8.45	6.77

The peak day during 2006 occurred in the month of July and had a peak day flow of 8.45 MGD. Thus over a ten-year period, the annual average daily flow increased by 25% and the monthly peak flow increased by 29%. Average daily flows have increased an average of 2.3% /year for the past ten (10) years.

Historically, population in the Ormond Beach utility service area has exhibited steady growth. Development trends in the area remain strong and population is expected to increase steadily throughout the planning period. A moderate

decline in the rate of population increase is expected to occur as the area approaches build-out. However, a large D.R.I., Ormond Crossings, will continue development trends and generally sustain historical growth patterns. Service Area population information was obtained from Ormond Beach’s Community Development Department (CUP) data and Traffic Analysis Zone (TAZ) data. Historical population increases in the utility service area since 1996 are detailed below in **Table 1-2**.

Table 1-2
Ormond Beach Utility Service Area
Historical Population (1996 – 2006)

Year	Population
1996	47,023
1997	47,801
1998	48,579
1999	49,358
2000	50,870
2001	51,654
2002	52,369
2003	53,224
2004	53,974
2005	54,853
2006	55,667

Review of **Table 1-2** yields an average growth rate of 1.7% per year for the 10 year period. A slightly lower rate of growth is generally expected to continue throughout the study period due to the effects of build-out, but specific developments and service area increases are expected to maintain a growth rate of approximately 1.4% through 2025. These areas are described in more detail within Section IV.

**Table 1-3
Historical Flow and Population**

YEAR	Raw Water Flow (mgd)	HR & BT Flow (mgd)	Total Ground Water Flow (mgd)	Population	Gross Per Capita Flow (gpcd)
1997	5.01	0.63	5.64	47,801	118
1998	5.02	0.81	5.83	48,579	120
1999	5.38	0.64	6.02	49,358	122
2000	5.70	0.82	6.52	50,870	128
2001	5.50	0.72	6.22	51,654	120
2002	5.56	0.66	6.22	52,369	119
2003	5.60	0.58	6.18	53,224	116
2004	5.87	0.59	6.46	53,974	120
2005	5.92	0.75	6.67	54,853	122
2006	6.25	1.34	7.59	55,667	136

Notes:

1. HR & BT Flow represents groundwater used for irrigation in Hunter's Ridge and Breakaway Trails
2. Historical population based upon planning department, CUP and TAZ Data.

Historical flow data is obtained from the City's Water Treatment Plant and irrigation system records. The 'raw water flow' represents influent flow into the water plant. The 'HR & BT' flow represents well withdrawals for irrigation supply at Hunter's Ridge and Breakaway Trails. Irrigation demand at Breakaway Trails is supplemented by stormwater from an on-site pond.

Demand in 2006 was high due to drought conditions. Excessive irrigation demand in the potable distribution system and within Hunter's Ridge/Breakaway Trails contributed to abnormally high per capita demand.

(3) Planning Period

The planning timeframe for the Water Supply Work Plan is 10 years (FY 07/08 through FY 16/17).

(4) Unincorporated Service Areas and Wholesale Agreements

A) Hunters Ridge

The City provides water and sewer service to residents within Hunter's Ridge. This development is located in Volusia and Flagler County. Flagler County residents who will reside in Hunter's Ridge will be wholesale or retail customers of Ormond Beach. A groundwater allocation of approximately 426,000 GPD is assigned by SJRWMD in 2021 to supply Flagler County residents in Hunter's Ridge. The portion of Hunter's Ridge in Flagler County will have an estimated buildout of 1,624 units and 3,492 people.

B) S.W. Service Area

Unincorporated areas south of SR 40 and west of Tymber Creek Road are identified herein as the S.W. Service Area. A recently negotiated Utility Service Agreement (USA), involving Daytona Beach and Ormond Beach, established boundaries and terms for water and sewer service within the area.

Based upon the County's Future Land Use Map (FLUM) for the subject area, it is largely composed of conservation and rural residential zoned property. Traffic Analysis Zone (TAZ) data for the property indicated a 2020 population of approximately 3,100 within the area. It is probable that future zoning changes in the area will increase densities. A 16-inch diameter extension of the 16-inch water main along SR 40 is recommended to serve this future area.

A portion of the service area is sited east of the Tomoka River and south of Old Tomoka Road. It is isolated from the remainder of the area and will require separate water main extensions. The extensions will connect to the existing main on SR 40 or the proposed water main extension along Hand Avenue, when it is constructed.

C) County – Halifax Plantation

At the far northern extents of the City's service area is the community of Halifax Plantation in unincorporated Volusia County. Water service to the subject community is provided by Volusia County Utilities via their Halifax Plantation water plant. The County plant would benefit greatly by an interconnect with the Ormond Beach system. If the County plant was ever shut down for maintenance or failure, an interconnect with the City's system could allow for a redundant water supply at negotiated wholesale rates. At this time, neither an interconnect or wholesale rate exists.

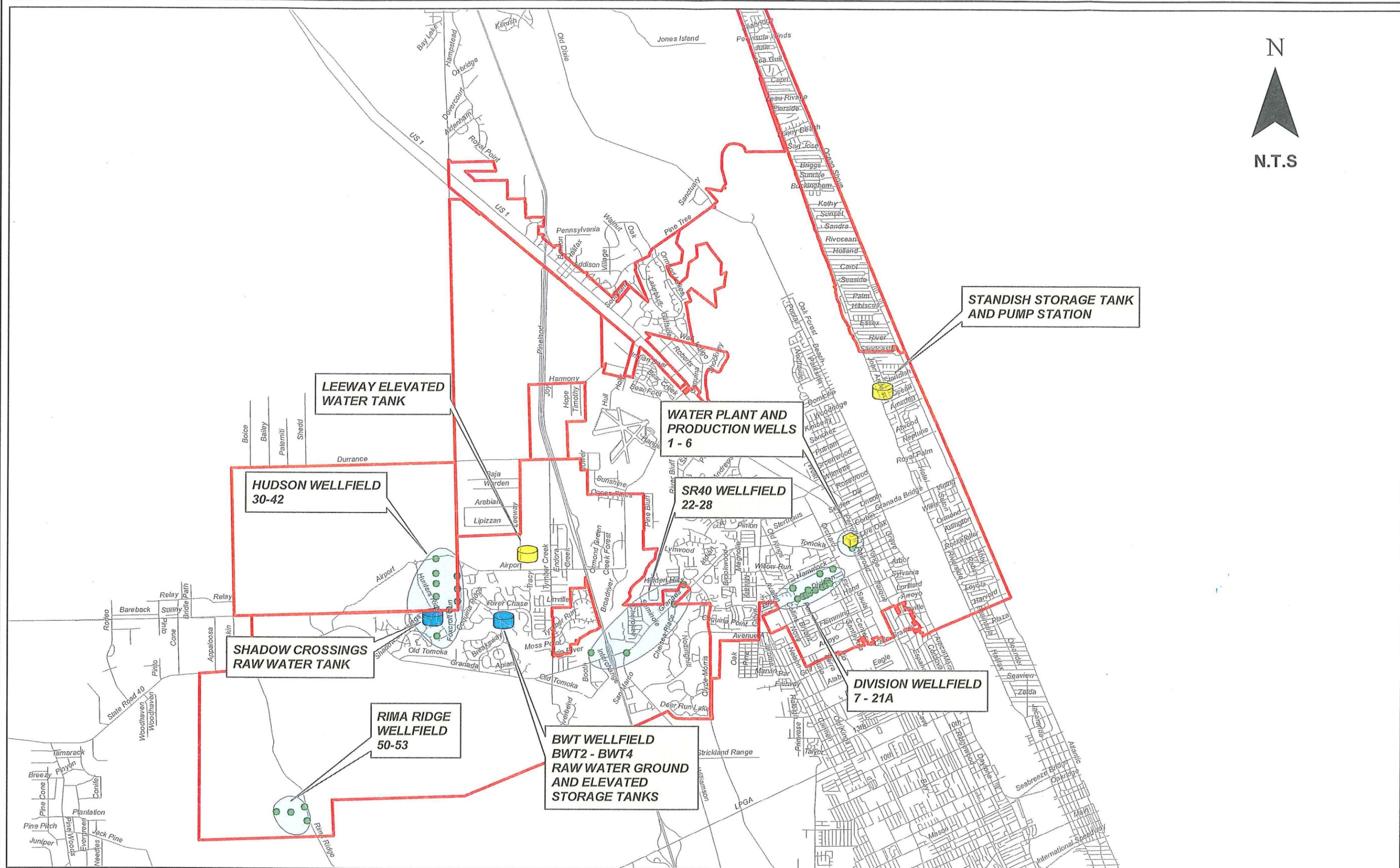
The subdivision currently has 1,873 metered water connections and average daily consumption is approximately 200,000 GPD. The estimated buildout unit count in Halifax Plantations and Plantation Oaks is 4,200, (source: Volusia County Utility Department).

D) North Peninsula

The unincorporated beachside areas north of Sandcastle Drive receive retail water service from the City of Ormond Beach. Approximately 9,400 Volusia County residents live in the area typically referenced to as 'Ormond By-The-Sea'.

E) County – North, US1 Highway 1

Unincorporated areas north of Southland Drive, adjacent to US Highway 1, are served by the City. This includes significant commercial and industrial areas in



OB35 water supply facilities POTABLE WATER COMPONENTS.mxd

DATE	BY	DESCRIPTION	DATE	BY	REVISION DESCRIPTION

QUENTIN L. HAMPTON ASSOCIATES, INC.
 CONSULTING ENGINEERS
 FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER: 625
 P.O. DRAWER 290247 PORT ORANGE, FL 32129-0247
 PHONE: 386.761.6810 FAX: 386.761.3977

CITY OF ORMOND BEACH
 WATER
 SUPPLY PLAN

PRIMARY WATER
 COMPONENTS

FIGURE 2.1

RICHARD W. FERNANDEZ, P.E. 14722
 MARK A. HAMPTON, P.E. 27391
 BRADLEY T. BLAIS, P.E. 47130
 DAVID A. KING, P.E. 50809
 ANDREW M. GIANNINI, P.E. 46601

DESIGNED	DATE
DRAWN	DATE
CHECKED	DATE
APPROVED	DATE

SCALE AS SHOWN
 SHEET NO. x OF x

Section III

Water and Reclaimed Water Systems

A. Existing Water System

(1) Water Supply and Production Areas

Water supply for the City of Ormond Beach is derived from a series of Upper Floridan Aquifer wells installed throughout the service area. The present and projected growth of the area has required the installation of new wells to meet increased demand. Additional wells are also proposed to increase rotational capacity and provide water supply for new development.

(2) Existing Wells and Capacities

The City of Ormond Beach operates a single water treatment plant with a rated capacity of 8.0 MGD. The Ormond Beach Water Treatment Plant (OBWTP) is located north of Jefferson Street, west of US-1 and east of the F.E.C. Railway adjacent to Tomoka Avenue. It is a conventional lime softening plant, construction of a 4.0 MGD reverse osmosis (RO) plant expansion is currently underway. The new facility is scheduled for completion in March 2008. A tabular listing of each well, casing size, depth, capacity, and status is included as **Table 3-1**.

**Table 3-1
Existing Wellfield Capacity**

City Well Number	Wellfield	Status	Casing Dia. (in)	Well Depth (ft)	Pump HP	Design Capacity (gpm)	Design Capacity (mgd)	Design TDH (ft)	Drill Date
1	Water Plant	Stand-By	6	186	5	105	0.151		1952
2	Water Plant	Stand-By	6	210	7.5	170	0.245	100	1952
3	Water Plant	Not Equipped	6	202					1952
4	Water Plant	Not Equipped	6	202					1952
5	Water Plant	Not Equipped	8	182					1955
*6	Water Plant	Not Equipped	8	207					1955
7	Division	Abandoned	8	201					1958
8A	Division	Primary	12	201.5	15	300	0.432	110	1999
9A	Division	Secondary	12	190	10	300	0.432	75	1999
10A	Division	Primary	12	206	15	300	0.432	110	1999
11A	Division	Primary	12	225	20	300	0.432	190	1999
12A	Division	Primary	12	220	15	250	0.360	110	2003
13	Division	Primary	6	229	20	200	0.288	222	1969
13A	Division	Primary	12	220	20	300	0.432	190	2001
15	Division	Abandoned							
15A	Division	Primary	12	210	10	300	0.432	110	2001
16	Division	Abandoned							
17	Division	Abandoned							
18	Division	Abandoned	8	200					1976
19	Division	Secondary	8	200	10	180	0.259	100	1976
21A	Division	Primary	12	220	10	250	0.360	110	2003
22	SR 40	Primary	8	200	7.5	250	0.360	64	1979
24	SR 40	Primary	6	200	15	275	0.396	68	1979
*26	SR 40	Not Equipped	8	170					1981
28	SR 40	Primary	6	203	15	200	0.288	130	1982
30	Hudson	Primary	6	270	10	138	0.199	150	1987
31	Hudson	Primary	6	270	10	138	0.199	150	1987
32	Hudson	Primary	6	270	7.5	73	0.105	200	1987

City Well Number	Wellfield	Status	Casing Dia. (in)	Well Depth (ft)	Pump HP	Design Capacity (gpm)	Design Capacity (mgd)	Design TDH (ft)	Drill Date
33	Hudson	Primary	6	270	7.5	73	0.105	200	1987
34	Hudson	Primary	6	270	7.5	73	0.105	200	1987
35	Hudson	Primary	6	270	7.5	73	0.105	200	1987
36	Hudson	Primary	6	271	7.5	73	0.105	200	1987
37	Hudson	Primary	6	270	7.5	73	0.105	200	1987
38	Hudson	Primary	6	270	7.5	138	0.199	150	1987
39	Hudson	Primary	6	270	10	138	0.199	150	1987
40	Hudson	Primary	6	270	10	138	0.199	150	1987
41**	Hudson	Irrigation/ Fire Protection	6	270	10				1987
42**	Hudson	Irrigation/ Fire Protection	6	270	7.5				1987
50	Rima Ridge	Primary	10	300	40	500	0.720	240	1987
51	Rima Ridge	Primary	10	300	40	500	0.720	240	1987
52	Rima Ridge	Primary	10	300	40	500	0.720	240	1994
53	Rima Ridge	Primary	10	300	40	500	0.720	240	1994
BWT-2**	Breakaway Trails	Irrigation/ Fire Protection	8	260	5	215	0.310		1985
BWT-3**	Breakaway Trails	Irrigation/ Fire Protection	8	260	5	260	0.374		1985
BWT-4**	Breakaway Trails	Irrigation/ Fire Protection	8	260	5	225	0.324		1985

Total Installed Raw Water Production Capacity **9.80**** **mgd**
Total Firm Raw Water Production Capacity, (largest single well out of service) **9.08**** **mgd**

Note: * Water Treatment Plant Well #6 and #26 is used for salt water monitoring only.
** Wells are used for irrigation and fire protection in Hunters Ridge and Breakaway Trails. These wells are not included in the total or firm raw water capacities.
For all wells, ground water is withdrawn from the Upper Floridan Aquifer.
For all raw water production wells, all groundwater is pumped to the Ormond Beach Water Treatment Plant.

Source: Ormond Beach Utilities, Water Production (Sep. 2003).
Water Supply System Evaluation (BFA, Feb. 1998).
Ormond Beach GIS (October 2003).

involves retrofitting existing residential and business areas south of Granada Boulevard to Harvard Drive. Approximately 1,700 potential customers are located in the service area. Estimated annual average demand from the area is approximately 820,000 GPD. Estimated peak, month reuse demand in the area is 1.1 MGD.

Retrofitting reclaimed water within existing areas is costly. An estimated cost to serve the area is approximately \$11 million. The estimated unit cost for this project is \$13.41/GPD.

(b) Option 'B' Breakaway Trails and Hunter's Ridge Reuse Extension

This project involves construction of new reuse transmission mains, and conversion of old force mains, to serve existing and new irrigation customers in Breakaway Trails, Hunter's Ridge, and Riverbend Golf Course.

There are currently 1,285 irrigation customers in Breakaway Trails and Hunter's Ridge. The customers are currently served using raw water (groundwater) which is pumped from storage tanks into a dedicated irrigation pipe network. Average annual use in 2006 was 1.34 MGD, peak use is significantly higher. In many cases, peak use exceeds the raw water supply capability. In these cases, irrigation service is suspended until adequate storage volume is recovered. It is significant to note that the irrigation pipe network also provides fire protection for this area. Reclaimed water is necessary to reduce groundwater demand and comply with CUP conditions that limit withdrawals to 0.51 MGD.

Another significant customer in the area is Riverbend Golf Course. The estimated irrigation demand for Riverbend is approximately 0.3 MGD. Total estimated annual average demand in the area is 1.5 MGD, estimated peak month demand is 2.25 MGD.

In order to serve the area, a series of improvements are required. Two (2) project phases are recommended. Phase I involves extension of a reuse main to Riverbend Golf Course, a Booster pump at Riverbend, conversion of the existing force main to reuse and new transmission mains to Breakaway Trails and Hunter's Ridge. Estimated Phase I costs are **\$4.1 million**. Phase II is a parallel 12" transmission main on Airport Road from Riverbend to Breakaway Trails. It will increase transmission capacity to satisfy peak demands. Estimated Phase II costs are **\$1.8 million**. The estimated unit cost for this project is \$3.93/GPD. A comparison of the projects is detailed below:

OPTION	DESCRIPTION	AVG ANNUAL DEMAND (GPD)	ESTIMATED COST (\$)	UNIT COST (\$/GPD)
A	S. Peninsula Reuse Distribution	850,000	\$11,000,000	\$12.94
B	Western Service Area Reuse Transmission, (I & II)	1,500,000*	\$5,900,000	\$3.93

* This number will be reduced if customers are charged based on demand.

Conclusion: Option 'B' was approved by the City Commission.

Section IV

Water Use and Capital Needs

A. Historic Water Use

In Section I of this report we summarized historical water use in terms of total flow and per capita usage. In 2006, an approximate service area population of 55,667 used an average of 7.59 MGD.

This year was an anomaly and represents significantly higher per capita consumption than previous years. Table 4-1, below, details flows for the previous 10 years. Average gross per capita demand since 2001 is 122 GPCD.

**Table 4-1
Historical Population and Flow Data**

Year	Service Area Population	Treated Water Pumped (mgd)	Raw Water Flow (mgd)	HR & BT Flow (mgd)	Total Ground Water Flow (mgd)	Average Per Capita Treated (gpcd)	Average Per Capita Ground (gpcd)
1997	48,396	5.09	5.01	0.63	5.64	105	118
1998	50,236	5.41	5.34	0.81	6.15	108	127
1999	51,373	5.59	5.61	0.64	6.25	109	127
2000	51,673	5.76	5.72	0.82	6.26	111	123
2001	52,373	5.50	5.50	0.72	6.22	105	120
2002	52,976	5.60	5.56	0.66	6.22	106	119
2003	53,698	5.65	5.61	0.58	6.19	105	116
2004	54,373	6.30	5.89	0.59	6.48	116	120
2005	55,056	6.42	5.92	0.75	6.67	117	122
2006	55,667	6.98	6.25	1.34	7.59	125	136
Averages						110	122

1. Treated water pumped includes plant recirculation flows
2. HR & BT Flow represents groundwater used for irrigation in Hunter's Ridge and Breakaway Trails
3. Historical population based upon CUP and TAZ data.

Projected population and demand growth through 2025 includes SJRWMD population and BEBR demand projections through 2025. The projections come from SJ2004-SP19, 'Population and Water Usage Projection for Volusia County' by Burton & Associates. The Burton & Associates (B&A) study used census data, BEBR data, land use, historic growth trends, discussions with cities about anticipated developments of regional impact (DRIs), and potential new job centers to generate population projections for each utility service area. These population projections were then modified to reflect additional demand associated with the southwest service area and Ormond Crossings D.R.I. The population data was then multiplied by the per capita water usage to obtain demand projections. The projected population is higher than the B & A report; however, the estimated water demand is consistent with both the SJRWMD data and the City's C.U.P. allocations. Per capita use also increases due to concentrate waste associated with the R/O process. Population and flow projections are detailed in Table 4-3.

B. Demand Analysis and Projections

(1) Current CUP Status

The primary constraint limiting the City's groundwater withdrawals is defined in Ormond Beach's Consumptive Use Permit, (C.U.P.). St. Johns River Water Management District issued CUP #8932 in May 2004. It expires May 2024; conditions in the permit allow for evaluation and updating by SJRWMD at five (5) year increments. Maximum annual groundwater withdrawals and maximum daily withdrawals are specified in the permit. The permitted allocations are adequate to satisfy projected demands, with certain constraints. The constraints relate to irrigation demand and concentrate withdrawals associated with the new R/O process.

As detailed within Table 4-3, the projected withdrawals are dependent upon reducing irrigation demand in Breakaway Trails and Hunter's Ridge and limiting the volume of concentrate required for water treatment. A tabular listing of permitted and projected withdrawals is detailed below:

**Table 4-2
Projected Water Demand and Supply**

Year	Utility Service Area Population		Water Demand (mgd)			Water Supply (mgd)			Surplus/Deficiency
			Potable	Non-Potable	Total	Traditional	Alternative	Reclaimed	
2008	In City	-	4.77	0.60	5.27	7.25	-	-	0.05
	Outside	-	1.86	-	1.86				
	Total	57,911	6.63	0.60	7.23				
2009	In City	-	5.00	0.40	5.40	7.39	-	-	0.09
	Outside	-	1.95	-	1.95				
	Total	59,033	6.95	0.40	7.35				
2010	In City	-	5.13	0.40	5.53	7.53	*0.05	-	0.06
	Outside	-	1.99	-	1.99				
	Total	60,546	7.12	0.40	7.52				
2011	In City	-	5.31	0.20	5.51	7.55	*0.05	-	0.02
	Outside	-	2.07	-	2.07				
	Total	61,391	7.38	0.20	7.58				
2012	In City	-	5.38	0.20	5.58	7.69	*0.05	-	0.07
	Outside	-	2.09	-	2.09				
	Total	62,236	7.47	0.20	7.67				
2013	In City	-	5.52	0.20	5.72	8.08	**0.55	-	0.71
	Outside	-	2.15	-	2.15				

Year	Utility Service Area Population		Water Demand (mgd)			Water Supply (mgd)			Surplus/Deficiency
			Potable	Non-Potable	Total	Traditional	Alternative	Reclaimed	
	Total	63,081	7.67	0.20	7.87				
2014	In City	-	5.59	0.20	5.79	8.22	**0.55	-	0.76
	Outside	-	2.18	-	2.18				
	Total	63,926	7.77	0.20	7.96				
2015	In City	-	5.65	0.20	5.85	8.36	**0.55	-	0.81
	Outside	-	2.20	-	2.20				
	Total	64,771	7.85	0.20	8.05				
2016	In City	-	5.72	0.20	5.92	8.51	**0.55	-	0.86
	Outside	-	2.23	-	2.23				
	Total	65,616	7.95	0.20	8.15				
2017	In City	-	5.79	0.20	5.99	8.6	**0.55	-	0.86
	Outside	-	2.25	-	2.25				
	Total	66,461	8.04	0.20	8.24				

- (1) Traditional is based on CUP groundwater allocation. CUP issues on 5/11/04; expires 5/11/24.
- (2) Supply from Western Ormond Beach Reclaimed Water Distribution Project
- (3) Supply from reclaimed projects not considered AWS.

* Alternative water supply project Reuse Storage and pumping (2009-2012) realizes a 0.05 MGD resource for irrigation due to increase in system reliability and storage capacity.

** Alternative water supply project Western Reclaimed Water Distribution (2013-2017) results in alternate irrigation resource for 0.50 MGD on existing allocation based on areas served at Hunter's Ridge and Breakaway Trails.

In addition to annual average and maximum groundwater withdrawals, the permit specifies average and maximum withdrawal rates from the six (6) wellfields. The following **Table 4-4**, details permitted withdrawals.

Table 4-3
City of Ormond Beach
Permitted Average Daily Withdrawals From Each Wellfield

Year	Division Avenue	State Route 40	Hudson	Rima Ridge	Water Plant	Breakaway Trails
2004	2.48	0.51	1.30	2.16	0.12	0.51
2005	2.49	0.48	1.30	2.55	0.12	0.51
2006	2.50	0.50	1.30	2.66	0.12	0.51
2007	2.50	0.50	1.30	2.74	0.12	0.51
2008	2.50	0.52	1.30	2.82	0.12	0.51
2009	2.50	0.53	1.30	2.88	0.12	0.51
2010	2.50	0.54	1.30	2.95	0.12	0.51
2011	2.50	0.55	1.30	3.01	0.12	0.51
2012	2.50	0.56	1.36	3.04	0.12	0.51
2013	2.50	0.57	1.42	3.08	0.12	0.51
2014	2.50	0.58	1.48	3.15	0.12	0.51
2015	2.50	0.59	1.54	3.22	0.12	0.51
2016	2.50	0.60	1.60	3.30	0.12	0.51
2017	2.50	0.61	1.68	3.30	0.12	0.51
2018	2.50	0.62	1.76	3.30	0.12	0.51
2019	2.50	0.63	1.84	3.30	0.12	0.51
2020	2.50	0.64	1.92	3.30	0.12	0.51
2021	2.50	0.65	2.00	3.30	0.12	0.51
2022	2.50	0.65	2.00	3.30	0.12	0.51
2023	2.50	0.65	2.00	3.30	0.12	0.51
2024	2.50	0.65	2.00	3.30	0.12	0.51

Current permit allocations are adequate to satisfy projected demands through 2021. Implementation of reclaimed water service to Hunter's Ridge and Breakaway Trails will allow a reduction in groundwater withdrawals to satisfy system demand without exceeding permitted allocations.

It should be noted that a modification of interim CUP allocations may be necessary to meet demand associated with R/O concentrate. The original CUP only assumed a total concentrate demand of 0.4 MGD. The plant size was increased to 4.0 MGD, estimated recovery is 80% with concentrate flows of 20% or 0.8 MGD at 4.0 MGD flow. Therefore, modification of the City's CUP may be required. The modification request would be limited to a change of interim allocations, not the total permitted allocation.

C. Source Needs Assessment

Currently, SJRWMD has not identified groundwater deficits associated with future aquifer withdrawals from the Ormond Beach wellfields through 2020. Implementation of MFL Legislation has the potential to change regional deficit projections. Another potential constraint associated with the MFL issue is the cumulative effect of groundwater withdrawals.

SJRWMD has the legislative authority to limit Consumptive Use Permit (CUP) allocations for individual permit holders based upon cumulative groundwater withdrawals, and their potential effect upon MFL's. Therefore, future regional groundwater deficits may be assigned countywide, but not on a utility-by-utility basis. In the event that this occurs, Ormond Beach should be prepared to meet future demands utilizing traditional and alternative sources as detailed below.

(1) Groundwater

At the time of this writing, the City of Ormond Beach has existing, firm raw water supply capacity of 9.08 MGD. Permits have been obtained and funds budgeted to construct seven (7) new wells during FY'07, FY'08, and FY'09. Upon completion of the new wells, the City will have a firm capacity of 12.9 MGD, sufficient to satisfy peak demands for the duration of the study period.

Similarly, the City's C.U.P. establishes groundwater withdrawal allocations through 2024. Review of projections indicates that currently permitted allocations are sufficient to satisfy groundwater demands through 2022. Therefore, the City has a combination of existing and proposed groundwater sources which are capable of satisfying existing and proposed raw water supply needs.

(2) Brackish Groundwater

The new 4.0 MGD water treatment plant expansion will enable full utilization of existing and proposed wells, including those with elevated chlorides. Current C.U.P. conditions require utilization of lower quality water sources. Four of the City's proposed wells are in the Division Avenue wellfield. Potential exists for a gradual decline in water quality from these wells. Additional wells will provide rotational capacity. Wells constructed into the LFA have potential to provide significant yield. Water from the LFA is expected to be brackish, 2,000 – 5,000 mg/L chlorides, but it may be blended to produce a raw water which is compatible with the City's new membrane process. Further evaluation of the alternative water source (AWS) is warranted. A test well program is recommended to accomplish this goal.

(3) Conservation and Demand Reduction

Existing WAV sponsored conservation programs such as low-flow showers and toilets, rain sensors for lawn irrigation, xeriscape and educational programs will stay in effect. The use of reclaimed water to supplement and replace groundwater usage is proposed.

Currently, groundwater is used for irrigation in Hunter's Ridge and Breakaway Trails. Extension of reuse mains to satisfy this need will reduce groundwater usage by approximately 0.5 MGD. This project is contained in the Western Ormond Beach Reclaimed Water Distribution Project scheduled for completion in

FY'12-'13. A low interest State Revolving Fund (SRF) loan is proposed to fund this work.

(4) Facility Work Plan Capital Needs

A series of raw water supply, potable treatment and reclaimed water projects have been identified to meet the City's existing and future water supply needs. All projects detailed herein have a dedicated funding source.

**Appendix C Beverly Beach Water and
Wastewater System Improvements
(2011 PER Update and Supplement)**

Beverly Beach Water and Wastewater System Improvements

2011 Preliminary Engineering Report (PER) Update and Supplement

for



February 28, 2011

Prepared by:



Kimley-Horn and Associates, Inc.

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- EXHIBIT 2 - Irma Velez, City of Palm Coast Utility Department correspondence
Draft "Flagler County/City of Palm Coast Interlocal Agreement for Wastewater Services
- EXHIBIT 3 - Beverly Beach WWTF Domestic Wastewater Facility Permit
FDEP Consent Order (December 2010)
- EXHIBIT 4 - Master Wastewater Meter Location maps
- EXHIBIT 5 - DRAFT Flagler County/City of Palm Coast Interlocal Agreement
- EXHIBIT 6 - Site Plans and Project Limit Exhibits

INTRODUCTION

2011 Preliminary Engineering Report Update and Supplement

In September 2008, Kimley-Horn and Associates, Inc. (KHA) was selected by Flagler County to serve as the successor engineers for the Beverly Beach Water and Wastewater System Improvements project. In April 2010, KHA was tasked by Flagler County to prepare an update to the February 24, 2005 Preliminary Engineering Report (PER) prepared by Hartman Consulting, Inc. (HCI). This was the last PER filed with the county and United States Department of Agriculture Rural Development (USDA). Since February 2005, additional alternatives and project options to those identified in the HCI PER have become feasible and are being pursued by the county. These options will be reviewed as part of this update and supplement to the HCI PER.

The HCI PER was previously reviewed and approved by Flagler County and USDA and since the background details and historical facts regarding the existing facilities are relatively unchanged, the HCI PER, including several of its findings and conclusions are still applicable to the present day. KHA has reviewed the February 28, 2005 HCI PER and agrees with and accepts the conclusions and findings stated within the sections of the 2005 PER that will remain unchanged as part of this update. Therefore, it is the goal for this update to the PER to re-assess all eight (8) sections of the PER, review any criteria or system changes germane to the previous findings, update and/or supplement those findings, and provide an engineering opinion on the alternatives that are presently available.

SECTION 1 GENERAL

1.1 BACKGROUND

There are no changes, amendments, or supplements to this section of the 2005 HCI PER.

1.2 PURPOSE OF REPORT

2011 Supplement to the PER: The purpose of this document is to provide an update to the February 24, 2005 Preliminary Engineering Report (PER) prepared by Hartman Consulting, Inc. (HCI), which was the last PER filed with the county and United States Department of Agriculture Rural Development (USDA). This PER Update and Supplement will re-evaluate the alternatives identified in the 2005 HCI PER that are being pursued by Flagler County.

**SECTION 2
PROJECT PLANNING AREA**

2.1 LOCATION

There are no changes, amendments, or supplements to this section of the 2005 HCI PER.

2.2 ENVIRONMENTAL RESOURCES PRESENT

2011 Supplement to the PER: KHA updated the Environmental Report (ER) which describes the environmental resources and constraints. Please reference the ER for details related to the environmental aspects of this project.

2.3 GROWTH AREAS AND POPULATION TRENDS

There are no appreciable changes, amendments, or supplements to this section of the 2005 HCI PER.

TABLE 2.4 – SYSTEM WATER USE			
User Category	# of Connections	Total Average Monthly Water Use (Gal/Mo)	Avg. Monthly Water Use per connection (Gal/mo)
Residential	472	2,203,700	4,669
Commercial	0	0	0
Schools	0	0	0
Hospitals	0	0	0
ACME Industries	0	0	0
Total	472	2,203,700	

* Water use data obtained from Flagler County and District records for the 12 month time period between Feb. 2009 and Jan 2010

TABLE 2-4a
SOUTHERN SERVICE AREA
PROJECTED AVERAGE DAILY BULK WATER PURCHASES
Updated 5/2010

Year	ERC's	gpd/ERC	Average Annual gpd
2008	472 ⁽²⁾	151	71,273 ⁽¹⁾
2009	472 ⁽²⁾	152	71,952 ⁽¹⁾
2010	472	153	72,063
2011	475	154	73,150
2012	489	155	75,834
2013	504	156	78,613
2014	519	157	81,490
2015	535	158	84,469
2016	551	159	87,554
2017	567	160	90,748
2018	584	161	94,055
2019	602	162	97,478
2020	620	163	101,022
2021	638	164	104,691
2022	658	165	108,489
2023	677	166	112,421
2024	698	167	116,491
2025	718	168	120,705
2026	740	169	125,066
2027	762	170	129,580
2028	785	171	134,253
2029	809	172	139,089
2030	833	175	145,760

⁽¹⁾ Actual recorded bulk purchases as recorded by Flagler County staff

⁽²⁾ Actual number of water customers per Flagler County May 2010

For planning purposes, assumes 3% increase in ERC's year-over-year.
Assumes future average density target of 1.75 persons per residence (or 175 gpd/ERC).

ERC – Equivalent Residential Unit

gpd – gallons per day

TABLE 2-5
SOUTHERN SERVICE AREA WASTEWATER FLOW PROJECTIONS
 Updated 5/2010

Year	Wastewater ERC	gpd per ERC	AADF gpd	Max 3-MADF PF	3-MADF gpd
2008	338 ⁽²⁾	92	31,200	1.14	35,500 ⁽¹⁾
2009	338 ⁽²⁾	94	31,800	1.06	33,840 ⁽¹⁾
2010	338	96	32,476	1.15	37,347
2011	350	98	34,329	1.15	39,478
2012	375	100	37,531	1.15	43,161
2013	400	102	40,833	1.16	47,366
2014	425	104	44,235	1.16	51,313
2015	450	106	47,737	1.17	55,853
2016	475	108	51,339	1.17	60,067
2017	500	110	55,041	1.18	64,949
2018	525	112	58,843	1.18	69,435
2019	550	114	62,746	1.19	74,667
2020	558	116	64,774	1.20	77,729
2021	575	118	67,898	1.20	81,477
2022	592	120	71,089	1.20	85,307
2023	610	122	74,471	1.20	89,365
2024	628	124	77,924	1.20	93,509
2025	647	126	81,576	1.25	101,969
2026	666	128	85,303	1.25	106,629
2027	686	130	89,237	1.25	111,546
2028	707	132	93,383	1.25	116,728
2029	728	134	97,612	1.25	122,015
2030	750 ⁽³⁾	140	105,000	1.25	131,250

⁽¹⁾ Based on actual recorded wastewater flows as recorded by Flagler County staff

⁽²⁾ Actual number of wastewater customers per Flagler County May 2010

⁽³⁾ Assumes future wastewater customer base will increase proportional to water customers to a max ratio of 90% at year 2030.

For planning purposes, assumes septic tank phase-out at 25 customers per year from 2010-2020.

Target Max 3-MADF PF of 1.25

AADF – Average Annual Daily Flow

Max 3 – MADF PF – Maximum 3 Month Average Daily Flow as percentage of Average Annual Daily Flow

3-MADF- 3 Month Average Daily Flow

**SECTION 3
EXISTING FACILITIES**

3.1 LOCATION

There are no changes, amendments, or supplements to this section of the 2005 HCI PER.

**TABLE 3-1
Flagler County Barrier Island
Water Service Areas
Updated 5/2010**

<u>Water Service Area</u>	<u>Water Supply Source</u>
Flagler Beach	Self
Ocean City/Beverly Beach	Palm Coast/Flagler Beach ⁽¹⁾
Flagler By-the-Sea	Palm Coast
Dunes Community Development District Unincorporated County (map)	Palm Coast and Dunes CDD RO WTP
Sea Colony	Palm Coast
Matanzas Shores Owner's Association	Palm Coast
Maritime Estates	Palm Coast
Marineland	Self/Interconnect PC ⁽²⁾

⁽¹⁾ An emergency Fire Protection Interconnect with the City of Flagler Beach water system was made in 2007/08.

⁽²⁾ Palm Coast water transmission facilities around the southern boundary of the Marineland Community.

3.2 HISTORY

There are no changes, amendments, or supplements to this section of the 2005 HCI PER.

3.3 CONDITION OF FACILITIES

2011 Update to the PER:

Water System: In 2007/08, Flagler County completed a second water system interconnect with the City of Flagler Beach on the southern end of the Beverly Beach service boundary. A 4-inch water system interconnect was made to provide an emergency source of water and to improve the water system pressure and capacity for fire protection needs. This interconnect is only used under emergency demands

associated with fire flows. In addition, Flagler County staff finished installing multiple fire hydrants along State Road (S.R.) A1A to reduce the previous hydrant spacing and provide more reliable fire protection within the Beverly Beach service boundary. Installation of the fire hydrants along S.R. A1A was completed in October 2009.

Flagler County currently has contractual agreements (see EXHIBIT 1) with the City of Palm Coast for 80,000 gpd annual average of bulk purchased potable water for the Beverly Beach service boundary. Based on the 2009 water usage data shown in TABLE 2-4a (71,952 gpd), there is approximately 8,048 gpd of purchased water capacity remaining in these agreements. Based on the water use projections shown in TABLE 2-4a (81,490 gpd), an additional 10,000 gpd of capacity from the City of Palm Coast will be required by 2014. The estimated cost to acquire the additional 10,000 gpd of bulk capacity from the City of Palm Coast is \$113,000.

Wastewater Facilities: The Beverly Beach Wastewater Treatment Plant (BBWWTP) currently has a permitted capacity of 85,000 gallons per day (gpd). The facility operating records indicate that over the past year (2009), the plant received wastewater flows of approximately 33,800 gpd on an annual average basis, with a maximum month annual average flow of approximately 54,800 gpd. The actual recorded annual average wastewater flows for the past 5-years (~35,100 gpd) are significantly less than the rated capacity for the facility (85,000 gpd). Similar to the operating and compliance issues stated in the 2005 HCI PER, the BBWWTP continued to experience effluent quality violations. The BBWWTP has not reliably met the permitted effluent limits for constituents such as; total recoverable zinc, total recoverable copper, dissolved oxygen, chlorine residual, and toxicity screening. Past violations stem from failures to meet effluent limits for total recoverable copper and total recoverable zinc. In August 2009, the Florida Department of Environmental Protection Agency (FDEP) issued a Consent Order (OGC-09-0852) on July 15, 2009 requiring Flagler County to prepare a collection and treatment system evaluation and Compliance Plan to identify causes and implement corrective actions to bring the BBWWTP into effluent limit compliance for total recoverable copper and total recoverable zinc as stated in the facility's operating permit. Flagler County is currently complying with the Compliance Plan approved by FDEP, and has met the objective dates outlined in the plan for improving total recoverable copper and total recoverable zinc limits.

Flagler County has made some adjustments and upgrades to the operating process, installed more reliable equipment, cleaned out the aeration tanks, and combined the influent pipes to the plant in an effort to improve system performance and meet their permitted effluent limits consistently. Despite meeting the objectives outlined in the Compliance Plan, the sampling results for total recoverable copper and total

recoverable zinc have varied and are not reliably meeting the permit limit criteria, and therefore these improvements in the equipment and operation of the BBWWTP are essentially temporary fixes.

On December 17, 2010 FDEP issued a new Operating Permit for the Beverly Beach WWTF (Permit No. FL0039756-010 (Minor)). In addition, FDEP issued Consent Order Number 09-0582 for the BBWWTP, which became effective on December 7, 2010, for the purpose of enforcing effluent exceedances of total recoverable copper, total recoverable zinc, total recoverable mercury, and whole effluent toxicity. The Consent Order allows for amended maximum interim effluent limits for the referenced constituents until the first of either the facility achieves full compliance with the standard limits or November 30, 2012. Based on our involvement in renewing the BBWWTP Operating Permit, review of the facility's condition, and review of the recent years effluent sampling data, our opinion is that the facility should be retired from service and decommissioned within the next FDEP operating permit cycle. Both the Operating Permit and Consent Order can be found in EXHIBIT 3.

In addition to the challenges associated with the wastewater treatment processes, there is significant flow data from the past 5 years (2005-2009) indicative of massive flow spikes likely associated with inflow and infiltration (I/I) within the sanitary collection system. KHA suggests that Flagler County conduct a system-wide study and evaluation of the sanitary collection system to identify the extent of I/I.

Table 3-10 from the 2005 HCI PER is updated below with the current effluent parameter limits, as stated in the most recent FDEP Operating Permit:

TABLE 3-10
Effluent Limits for BBWWTP
Updated 12/2010

Flow	0.085 MGD Treatment Capacity / 0.215 MGD Surface Water Annual Average Daily Flow (AADF)
CBOD5	10.0 mg/L (Annual Average) 10.0 mg/L (Monthly Average) 20.0 mg/L (Single Sample)
TSS	5.0 mg/L (Annual Average) 5.0 mg/L (Monthly Average) 10.0 mg/L (Single Sample)
Fecal Coliform	Arithmetic Mean of Monthly Samples not to exceed 200 per 100 mL
pH	6.5-8.5 s.u. (Single Sample)
Total Residual Chlorine (TRC) (for disinfection)	0.5 mg/L (Single Sample)
Total Residual Chlorine (TRC) (for disinfection)	0.01 mg/L (Single Sample)
Dissolved Oxygen (DO)	6.0 (Single Sample)
Total Recoverable Copper	3.7 µG/L (Single Sample)
Total Recoverable Zinc	86.0 µG/L (Single Sample)
Whole Effluent Toxicity	LC50 ≤ 100%
Receiving Stream Monitoring	SWU-1 and SWD-1 locations

TABLE 3-10a
Monthly Average Daily Flows (5 Years) for BBWWTP
Supplemented
5/2010

Monthly Average Daily Flow (MADF) - 5 Year Summary					
in Million Gallons per Day (MGD)					
Month	2005	2006	2007	2008	2009
January	0.0439	0.0316	0.0327	0.0337	0.0247
February	0.0549	0.0363	0.0449	0.0354	0.0299
March	0.0441	0.0356	0.0357	0.0357	0.0286
April	0.0541	0.0338	0.0268	0.0321	0.0236
May	0.0330	0.0243	0.0232	0.0238	0.0548
June	0.0387	0.0260	0.0263	0.0238	0.0290
July	0.0337	0.0285	0.0422	0.0319	0.0315
August	0.0274	0.0252	0.0317	0.0324	0.0291
September	0.0597	0.0342	0.0658	0.0305	0.0451
October	0.0589	0.0281	0.0486	0.0306	0.0301
November	0.0362	0.0299	0.0412	0.0314	0.0372
December	0.0338	0.0329	0.0316	0.0243	0.0424
Annual Average	0.0432	0.0305	0.0376	0.0305	0.0338
% change from prior year	-	-29.3%	23.1%	-18.9%	11.0%
Max. MADF	0.0597	0.0363	0.0658	0.0357	0.0548
% change from prior year	-	-39.2%	81.2%	-45.6%	53.3%

The BBWWTP currently serves approximately 472 ERCs, which are ~99% residential customers. The BBWWTP is located at 241 Starboard Drive, Beverly Beach, FL. The BBWWTP and effluent disposal facilities are permitted for operation under FDEP Permit No. FL0039756-010-DW3P, dated December 17, 2010. The BBWWTP, which is actually two treatment facilities operating in parallel, operates in extended aeration activated sludge mode. The treated effluent passes through sand filtration, is chlorinated, de-chlorinated, and is discharged through a single outfall pipe into the Intracoastal Waterway. All flows are measured at the plant influent and effluent discharge. The BBWWTP and effluent disposal system are owned and operated by Flagler County.

Operating data for the period beginning January 2009 and ending in December 2009 (Table 3-10a) indicates a monthly average daily flow (MADF) for the BBWWTP of 33,800 gpd. The maximum monthly flow over the same 12-month period equaled 54,800 gpd. The facility influent CBODs and TSS concentrations averaged 351 mg/L and 267 mg/L, respectively, for the same operating period.

3.4 FINANCIAL STATUS

2011 Update to the PER:

TABLE 3-11
Flagler County Single Family Residential Fee Schedule ⁽¹⁾
Updated 12/2010

<u>ERC / Meter Size</u>	<u>Base Facility Charge</u>	<u>Water</u>	<u>Sewer</u>
1 5/8 "		\$ 28.88	\$ 14.42
1.5 3/4"		\$ 43.38	\$ 21.63
2.5 1"		\$ 72.28	\$ 36.05
5 1-1/2"		\$ 144.55	\$ 72.10
8 2"		\$ 231.30	\$ 115.36
Meters in excess of 2" size will be considered on a case-by-case basis			
<u>Charge per 1,000 gallon</u>			
Residential		\$ 6.54	\$ 4.72
Commercial		\$ 6.54	\$ 5.65
<u>Impact Fee</u>			
Per ERC		\$ 2,780.00	\$ 2,500.00
System Capacity Fee		\$ 2,314.99	\$ 1,000.00
Tap-In Fee		\$ 63.00	Cost
Meter Installation (less than 1")		\$ 175.95	N/A
Meter Installation (1")		\$ 240.00	N/A
Meter Installation (greater than 1")		Cost	N/A
Initial Connection/Turn On		\$ 15.00	\$ 15.00
J&B or other construction		Cost	Cost
Deposit		\$ 75.00	\$ 75.00

⁽¹⁾ Effective Rates as of 04/03/2006

Table 3-12 lists the Short Lived Assets associated with the proposed project. These assets have typical life cycles less than 20 years.

TABLE 3-12			
SHORT LIVED ASSET SCHEDULE			
Asset	Cost	Qty	Typical Life Span (Yrs)
High Service Water Pumps	\$ 24,000	3	10
Wastewater Grinder Pumps	\$ 16,000	2	5
Water Ground Storage Tank Repainting	\$ 15,000	1	5
Metering Pumps	\$ 6,000	4	4
Chemical Tanks	\$ 3,000	2	5
Generator	\$ 50,000	1	20
Electronic Controls	\$ 7,500	5	10
Variable Frequency Drives	\$ 15,000	3	8

Table 3-13 is an anticipated estimate of Operation and Maintenance costs for the existing water and wastewater systems and facilities.

TABLE 3-13
FLAGLER COUNTY FY10
Sewer and Water Operation and Maintenance Expense (Estimate)
12/2010

Function	Sewer	Water
Salaries & Benefits	\$100,037.08	\$ 42,873.03
Engineering	\$ 9,179.35	\$ 3,934.00
Sludge Pumping	\$ 22,200.00	-
Laboratory Testing	\$ 10,910.09	\$ 4,129.33
FDEP Permitting	\$ 3,875.00	\$ 350.00
Cost of Water	-	\$ 56,737.46
Electricity	\$ 22,431.11	\$ 246.10
Telephone	\$ 1,337.76	\$ 573.33
Postage	\$ 1,752.38	\$ 1,752.38
Uniform Rental	\$ 584.99	\$ 584.98
Vehicle Insurance	\$ 457.00	\$ 457.00
Vehicle Maintenance	\$ 756.76	\$ 756.75
Vehicle Fuel	\$ 3,144.32	\$ 3,144.32
Casualty Insurance	\$ 7,054.60	\$ 3,023.40
Piping and Valves	\$ 5,413.80	\$ 2,320.20
Pumps	\$ 7,194.00	-
Hydrants	-	\$ 1,204.00
Tools	\$ 871.62	\$ 373.55
Printing	\$ 342.50	\$ 342.50
Office Supplies	\$ 405.60	\$ 173.83
Chemicals	\$ 11,612.64	\$ 1,161.26
Training	\$ 110.00	\$ 25.00
Computer	\$ 510.06	\$ 510.06
Planning & System Design	\$ 32,000.00	-
Engineering Dept Staff Time	\$ 7,358.71	-
Bank Fees	\$ 858.37	\$ 858.37
Interest on Advances	\$ 6,925.98	\$ 2,968.28
Total	\$257,323.72	\$128,499.13

Table 3-14 is a projected estimate of Operation and Maintenance costs for the proposed water and wastewater improvements project after it is placed into operation in year 2013.

TABLE 3-14
FLAGLER COUNTY
Estimated (Future Year 2013 Post-Pump Station Construction)
Sewer and Water Operation and Maintenance Expense
12/2010

Function	Sewer	Water
Salaries & Benefits	\$ 44,160	\$ 44,160
Engineering	\$ 9,455	\$ 4,053
Laboratory Testing	-	\$ 4,253
FDEP Permitting	-	\$ 350
Cost of Bulk Services *	\$ 54,961	\$ 58,440
Electricity	\$ 10,000	\$ 15,000
Telephone	-	\$ 591
Postage	-	\$ 1,752
Uniform Rental	\$ 585	\$ 585
Vehicle Insurance	\$ 457	\$ 457
Vehicle Maintenance	\$ 757	\$ 757
Vehicle Fuel	\$ 3,144	\$ 3,144
Casualty Insurance	\$ 7,055	\$ 3,023
Piping and Valves	\$ 2,500	\$ 2,320
Pumps	\$ 7,194	
Hydrants	-	\$ 1,204
Tools	\$ 200	\$ 374
Printing	-	\$ 343
⌘ Office Supplies	-	\$ 174
Chemicals	\$ 2,500	\$ 1,161
Training	\$ 110	\$ 25
Computer	-	\$ 510
Engineering Dept Staff Time	\$ 2,000	\$ 4,000
Bank Fees	\$ 858	\$ 858
Interest on Advances	-	\$ 2,968
Total	\$ 145,936	\$ 150,502

* **Cost of Bulk Services – The cost of the wastewater bulk service from the City of Palm Coast (City) is determined by the FY13 projected wastewater flows (~40,000 GPD avg. daily flow - estimated) times 365 days per year, times the City’s standard rate for wastewater (\$3.03 / 1,000 gallons), plus the City’s standard monthly base rate of \$893.61 per month.**

The cost of the water bulk service is determined by FY10 water fees (TABLE 3-13 above) times a 3% estimated growth factor.

FLAGLER COUNTY FISCAL SUMMARY 2004-2008

	FY 04	FY 05	FY 06	FY 07	FY 08	TOTAL
REVENUE						
Staff time to other departments			\$3,701	\$3,105		\$6,806
Water Billings		\$268,001	\$315,032	\$356,388	\$333,489	\$1,272,910
Turn on/off Fees			\$720	\$845	\$720	\$2,285
Meter Installation				\$1,888	\$528	\$2,415
Water Tap In Fee			\$252	\$315	\$63	\$630
Sewer Billings		\$103,594	\$105,997	\$109,966	\$116,178	\$435,735
Late Payment Penalties		\$2,949	\$3,690	\$5,204	\$4,286	\$16,129
Development Services		\$4,796	\$30,721	\$20	\$260	\$35,797
Investment Interest			\$6,982	\$33,298	\$17,973	\$58,253
Rents and Royalties		\$1,200				\$1,200
Refund - Prior Year Expense			\$96			\$96
Damages to County Property		\$4,155				\$4,155
Fixed Asset Sales				\$433		\$433
Miscellaneous			\$67	\$2		\$69
Customer Services		\$15,890				\$15,890
Interfund Transfer		\$100,000	\$41,000			\$141,000
Non-Operating Sources - Developers			\$117,500			\$117,500
Impact Fees (Can not be used to offset operating expense)		\$415,896	\$166,180	\$23,620	\$7,780	\$613,476
Total Revenue	\$0	\$916,481	\$791,938	\$535,084	\$481,277	\$2,724,780
Revenue Less Impact Fees	\$0	\$500,585	\$625,758	\$511,464	\$473,497	\$2,111,304
EXPENSE						
Personnel (Salaries & Benefits)	\$0	\$34,900	\$159,459	\$206,339	\$148,488	\$549,185
Ocean City Utilities Purchase	\$1,003,999					\$1,003,999
Hartman & Associates (Plant Evaluation)	\$19,923					\$19,923
Hartman & Associates (Beverly Beach)		\$116,213	\$19,590	\$79,156		\$214,959
Hartman & Associates (Eagle Lakes)			\$40,350	\$22,297		\$62,647
Hartman & Associates (Matanzas Settlement)			\$36,402			\$36,402
Kimley - Horn and Associates					\$5,972	\$5,972
Stephenson Surveying (Boundary Survey)	\$3,017					\$3,017
US Water Services (Beverly Beach Operations)		\$109,498				\$109,498
US Water Services (System Repairs)		\$303,018	\$18,269			\$321,287
US Water Services (Dechlor Tablets)		\$4,991				\$4,991
Flowers Chemical Labs (Wastewater Testing)			\$3,172	\$5,761	\$4,420	\$13,353
Gray Robinson, Attorneys at Law				\$1,739		\$1,739
Grove Scientific & Engineering (Bioassay Toxicity Tests)			\$3,000	\$2,850	\$300	\$6,150
Dumont Company (Hypchlrt Solution, Bisulfites)			\$5,268	\$5,080	\$3,356	\$13,703

Woody's Septic Service (Sludge Pumping)			\$17,975	\$13,777	\$12,355	\$44,107
Complete Underground Service (System Repairs)			\$25,609	\$16,857		\$42,466
Environmental Control Systems (System Repairs)			\$24,230	\$12,914	\$4,508	\$41,652
Florida DEP (Annual Reg Fee)		\$3,375	\$3,375	\$3,375	\$3,375	\$13,500
Governmental Services (Shared)			\$14,240	\$1,280	\$57,600	\$73,120
Employee Travel Expense		\$111				\$111
Employee Training/Education		\$1,338	\$379	\$909	\$921	\$3,547
Phone Service	\$106	\$1,345	\$1,774	\$1,643	\$1,611	\$6,479
Communications Installation	\$116		\$347			\$463
City of Bunnell (Water for Rental Office)			\$224			\$224
City of Palm Coast (Water for Utility)		\$27,178	\$62,866	\$58,290	\$50,909	\$199,243
City of Flagler Beach (Water - Interconnect)					\$9,139	\$9,139
Electricity	\$817	\$10,684	\$18,624	\$16,578	\$18,551	\$65,254
Postage (Mailings)		\$2,213	\$2,474	\$2,796	\$3,442	\$10,925
PO Box Rental	\$68	\$68	\$72	\$104		\$312
Office Rent		\$6,300	\$5,644	\$5,250		\$17,194
Miscellaneous Repair Parts & Tools		\$355	\$12,582	\$18,436	\$37,628	\$69,001
Grandview Pipe & Supply					\$9,079	\$9,079
6820 ZLLR Grinder				\$2,126		\$2,126
Sensus Meter System					\$8,186	\$8,186
Alpha General Systems					\$8,247	\$8,247
Equipment Rental		\$162			\$45	\$207
Sizemore Welding (Aluminum Drop-Box)	\$190					\$190
General Liability Insurance		\$2,774				\$2,774
Vehicle Insurance			\$508	\$1,517	\$909	\$2,934
Vehicle Fuel			\$1,402	\$4,852	\$3,883	\$10,137
Vehicle Repairs			\$1,450	\$1,608	\$4,302	\$7,360
Uniforms				\$884	\$391	\$1,275
RC Images (Magnetic Business Cards)	\$358					\$358
Legal Ads	\$248	\$816	\$280	\$489	\$69	\$1,902
Printing (Billing Postcards & Forms)		\$1,666	\$1,007	\$570	\$344	\$3,587
Office Supplies	\$947	\$1,817	\$1,517	\$473	\$1,406	\$6,160
Data Processing Supplies	\$310		\$17			\$327
Software Purchases & Licenses (HTE)	\$42,497	\$2,262	\$7,350	\$10,845		\$62,954
Depreciation	\$133	\$3,985	\$30,381	\$30,747	\$28,871	\$94,117
Fund 404 Account Analysis Charge (Finance)		\$320	\$809	\$1,041	\$1,635	\$3,805
Interest on Loans from General Fund		\$20,007	\$63,510	\$96,075	\$54,223	\$233,815
Write Offs/Shortages		\$1,311	\$1,948	\$95		\$3,354
Total Expense	\$1,072,729	\$656,707	\$586,104	\$626,752	\$484,163	\$3,426,454
Total Profit or Loss	-\$1,072,729	-\$156,122	\$39,654	-\$115,288	-\$10,665	-\$1,315,150

SECTION 4 NEED FOR PROJECT

4.1 HEALTH AND SAFETY

4.1.1 Customer Acceptance

There are no changes, amendments, or supplements to this section of the 2005 HCI PER.

4.1.2 State Regulation

2011 Supplement to the PER: Based on a review of the facility sampling and reporting data from 2005-2009, the following violations have been noted:

1. The monthly average effluent limit for CBOD₅ of 10.0 mg/L was exceeded six times; November 2006, March 2007, May 2007, June 2008, July 2009, and December 2009.
2. The monthly average effluent limit for TSS of 5.0 mg/L was exceeded four times; March 2005, April 2008, May 2008, and September 2008.
3. The single sample limit for CBOD₅ of 20.00 mg/L was exceeded twice; June 2008 and December 2009.
4. The single sample limit for TSS of 10.00 mg/L was exceeded in September 2008.

In addition to the above violations, FDEP documented the following violations in 2009, as summarized below:

1. An FDEP Wastewater Compliance Inspection Report conducted on June 15, 2009 reported that the BBWWTP was “significantly out of compliance” with respect to effluent quality. The June 15, 2009 tests exceeded limits for chlorine residual, pH, and toxicity.
2. A Consent Order (OGC-09-0582) was issued July 15, 2009 which requires the BBWWTP to comply with total recoverable copper and total recoverable zinc in the effluent to the Intracoastal Waterway.
3. Consent Order Number 09-0582B was issued on December 7, 2010, for the purpose of enforcing effluent exceedances of total recoverable copper, total recoverable zinc, total recoverable mercury, and whole effluent toxicity. The Consent Order allows for amended maximum interim effluent limits for the referenced constituents until the first of either the facility achieves full compliance with the standard limits or November 30, 2012.

There are no additional changes, amendments, or supplements to this section of the 2005 HCI PER.

4.1.3 Federal

2011 Supplement to the PER: The long term outlook for this facility is that as it continues to age and become less reliable and efficient, it will become increasingly difficult for the plant to meet the effluent limits for total recoverable zinc, total recoverable copper, chlorine residual, and toxicity. Violation of

these limits will continue to pose a threat to the aquatic habitat of the Intracoastal Waterway. A pump station project which interconnects to Palm Coast will eliminate a point discharge to the Intracoastal Waterway.

4.2 SYSTEM O&M

4.2.1 Water System

There are no changes, amendments, or supplements to this section of the 2005 HCI PER.

4.2.2 Wastewater

2011 Update to the PER: The proposed project will eliminate the need to operate and maintain an old, unreliable facility. The pump station will be integrated into the existing Beverly Beach wastewater collection system on the same site as the WWTP. Once the proposed Beverly Beach pump station is constructed, tested, certified, and placed into service, the existing BBWWTP will be decommissioned, demolished, and removed. Maintenance needs and resources will be reduced from 7 days per week to potentially once per month.

4.3 GROWTH

2011 Supplement to the PER:

4.3.1 Opportunity for Bulk Wastewater Transmission to City of Palm Coast

The BBWWTP is one of only two wastewater treatment facilities operated and maintained by Flagler County. The limited prospect for future growth in the Beverly Beach community and utility service boundary does not provide a compelling need for a new WWTP, nor is it supported when considered from a financial perspective and a county level of service perspective that is consistent with the needs of the community and the county as a whole. Alternatively, it is compelling to pursue the Palm Coast wastewater interconnect solution. This solution has similar capital needs, significantly lower annual operating costs (see Table 6-1), reduced staff needs, less demand for resources, and alleviates environmental concerns.

The pump station will be designed to initially meet a maximum monthly average daily flow of ~65,000 gpd, which will be peaked by a 4 peaking factor resulting in approximately 180 gpm. The design will anticipate accommodating a 5 to 8-year projected limited population growth horizon. Flexibility will be provided in the design to allow for future pump upgrades to accommodate future flows, as the customer base within the service area grows and flows increase beyond the initial pumps capacity.

**SECTION 5
ALTERNATIVES CONSIDERED**

5.1 WASTEWATER

2011 Update to the PER: The current wastewater treatment capacity for the City of Palm Coast WWTP #1 is 6.83 MGD as stated under FDEP Permit No. FL0116009.

There are no additional changes, amendments, or supplements to this section of the 2005 HCI PER.

5.2 ALTERNATIVE 1 - INDIVIDUAL FACILITIES

There are no changes, amendments, or supplements to this section of the 2005 HCI PER.

5.3 ALTERNATIVE 2 - OPTIMIZATION OF EXISTING FACILITIES

There are no changes, amendments, or supplements to this section of the 2005 HCI PER.

5.4 ALTERNATIVE 3 - BEVERLY BEACH WATER AND WASTEWATER (SUB-REGIONAL FACILITIES)

There are no changes, amendments, or supplements to this section of the 2005 HCI PER.

5.5 ALTERNATIVE 4 - CENTRAL WASTEWATER SYSTEM

There are no changes, amendments, or supplements to this section of the 2005 HCI PER.

5.6 ALTERNATIVE 5 - REGIONAL SYSTEM INTERCONNECTION

2011 Update to the PER: In the Fall 2009, Flagler County staff met with the City of Palm Coast staff to discuss the opportunity to develop an inter-local agreement to accept Beverly Beach's raw wastewater via sanitary pump station and forcemain. KHA attended a subsequent meeting on November 16, 2009 with Flagler County staff, the City of Palm Coast Public Works Director, and the City's consultant to discuss the opportunity in further detail. Topics discussed included the availability for Palm Coast to receive wastewater from Beverly Beach and to provide adequate treatment capacity at the Palm Coast WWTP #1 facility. As of May 2010, the city's consultant has prepared 60% design drawings for a proposed Palm Coast regional pump station, which is intended to serve portions of the barrier island, including wastewater flows from Beverly Beach. The proposed Palm Coast regional pump station will collect raw wastewater on the barrier island and transfer the waste to the west across the Intracoastal Waterway to

WWTP #1. Reportedly, the 100% design drawings and commencement of associated project permitting for the proposed Palm Coast regional pump station is underway. It is our understanding that the City of Palm Coast is actively assessing property on which to locate the pump station. It is anticipated that the Palm Coast regional pump station will be located in the vicinity of the Hammock Dunes Parkway bridge and S.R. A1A, with the metering interconnect located at the entrance to the Island Estates subdivision (See EXHIBIT 4). Both Flagler County and the City of Palm Coast believe this is a viable and attractive opportunity.

Flagler County has drafted an agreement with the City of Palm Coast (see “FLAGLER COUNTY/CITY OF PALM COAST INTERLOCAL AGREEMENT FOR WASTEWATER SERVICES” in EXHIBIT 5) to initially acquire 60,000 gpd of bulk wastewater treatment capacity associated with the Beverly Beach system. As of 2009, the wastewater AADF is 31,800 gpd (see TABLE 2-5) with a future flow projection of 60,000 gpd occurring in the range of 2018-2019. The initial bulk wastewater capacity fee is estimated at \$883,200 based on 60,000 gpd at \$14.72* per gallon, as stated in the referenced Interlocal Agreement **Section 4 - Fees and Usage** (see EXHIBIT 5). The current rate for bulk wastewater capacity from the City of Palm Coast is \$14.43 / gallon, pursuant to the December 28, 2010 email from Irma Velez, City of Palm Coast Utility Department (see EXHIBIT 2). However, for the purposes of projecting the rates at the time of actual capacity acquisition, a 2% escalation is assumed for the annual adjustment (* $\$14.43 \times 1.02 = \14.72), which typically occurs in October each year.

Alternative 5 is described in Table 5-7.

Since Palm Coast has identified the area needed for a regional pump station to serve the barrier island, and has acted by initiating a design for a regional pump station on the barrier island, the political and social impediments, as well as the prohibitive initial capital investment hurdles previously identified in the 2005 PER have been significantly mitigated or changed. As a result, Alternative 5 is now the most favorable Alternative.

TABLE 5-7
ALTERNATIVE 5
Updated 12/2010
Regional System Interconnection
Wastewater Alternate Summary⁽¹⁾

Location: Onsite at Beverly Beach WWTP location. Pump to City of Palm Coast.

Advantages:

- Elimination of Beverly Beach WWTP and potentially other Barrier Island wastewater facilities in the future
- Ability to coordinate Flagler County needs with Palm Coast's schedule
- Partnering with another community
- Similar to arrangement and business relationship between Flagler County and Palm Coast currently in use for potable water
- Strong Public Acceptance
- Regionalization and Economy of Scale in Operations
- Limited to Pump Station and Forcemain Pipeline Construction
- Ease of Operations
- Lower cost of Maintenance
- Positive Cash flows for Flagler County versus the negative cash flow for a WWTP
- Increased Longevity for service as compared to a WWTP
- Ease of Administration and Regulatory Compliance

Disadvantages:

- Additional Raw Wastewater Crossing of Intracoastal Waterway
- Lack of Rate Control
- Surcharges
- Lack of Customer Representation
- Loss of Equity to Provider of Treatment
- Loss of Long-Term Value

Capital Cost:⁽¹⁾ Initially \$6.07 million, with future capital needs for larger pumps, larger wetwell, and bulk capacity as customer base grows (future Capital Costs ~\$1.5 million)

O&M Cost:⁽¹⁾ Initially ~\$1.15 million, including City of Palm Coast wastewater impact and capacity fees, treatment rates, equipment maintenance, and staff. Future years will have O&M costs approximately \$200k per year.

⁽¹⁾ Costs shown in April 2010 dollars.

There are no additional changes, amendments, or supplements to this section of the 2005 HCI PER.

5.7 Water System Alternative Analysis

2011 Update to the PER: Flagler County currently has two contractual agreements (see EXHIBIT 1 *) with the City of Palm Coast for 80,000 gpd annual average of bulk purchased potable water for the Beverly Beach service boundary. In order to meet future growth needs, Flagler County will need to purchase additional bulk water capacity from the City of Palm Coast. Capacity is reserved from the City of Palm Coast in 10,000 gpd increments. Based on the 2009 water usage data shown in TABLE 2-4a (71,952 gpd), there is approximately 8,048 gpd of purchased water capacity remaining in the current agreements. Based on the water use projections shown in TABLE 2-4a (81,490 gpd), an additional 20,000 gpd of capacity (totally 100,000 gpd) will be required from the City of Palm Coast by 2014. The estimated cost to acquire the additional 20,000 gpd of bulk water capacity from the City of Palm Coast is \$226,000. The current rate for bulk water capacity from the City of Palm Coast is \$11.30 / gallon, pursuant to the December 28, 2010 email from Irma Velez, City of Palm Coast Utility Department (see EXHIBIT 2).

* The original Bulk Water Service Agreement for the Beverly Beach service boundary was originally established between Ocean City Utilities and Florida Water Services Corporation on December 22, 1999. On July 19, 2004, Flagler County executed a Water and Sewer System Purchase and Sale Agreement (see EXHIBIT 1A) which conveyed ownership of the water and sewer service area from Ocean City Utilities to Flagler County. In addition, but in an altogether separate transaction, the City of Palm Coast purchased the water and sewer utility from Florida Water Services Corporation in July 2003. As a result, the bulk water agreements between Ocean City Utilities and Florida Water Services Corporation have subsequently been assigned to the current water service owners, Flagler County and City of Palm Coast, through those transactions.

There are no additional changes, amendments, or supplements to this section of the 2005 HCI PER.

SECTION 6 SELECTION OF AN ALTERNATIVE

6.1 PRESENT WORTH COST ANALYSIS

2011 Update to the PER: Alternatives #1, #2, #3 and #4 remain unchanged from the 2005 HCI PER. In order to properly evaluate the cost associated with these alternatives, KHA updated the Total Present Worth values (shown in Table 6-1) from September 2004 dollars to April 2010 dollars by utilizing the growth in goods and services over this period as determined in the Consumer Price Index (CPI). Alternative #5 is revised and shown with April 2010 dollars, and not subject to the CPI adjustment. The most cost effective alternative as shown in Table 6-1 is the regional pump station described in Alternative 5.

6.2 MATRIX ANALYSIS OF NON-COST FACTORS

2011 Update to the PER: Based upon the non-cost factor alternative analysis shown on Table 6-2, Alternative 5 was the most favorable.

There are no additional changes, amendments, or supplements to this section of the 2005 HCI PER.

6.3 TRANSFORMATION CURVE ANALYSIS

2011 Update to the PER: This section is removed from the PER.

TABLE 6-1
PRESENT WORTH ANALYSIS SUMMARY
Using OMB Circular A-94 (3.2% for 20 years)
(\$ x 1,000,000)
Updated 12/2010

<u>Description</u>	<u>Alternative Described in Section 5</u>				
	<u>#1⁽¹⁾</u>	<u>#2⁽¹⁾</u>	<u>#3⁽¹⁾</u>	<u>#4⁽¹⁾</u>	<u>#5⁽²⁾</u>
<u>Capital Costs</u>					
Initial	\$ 0.2	\$ 1.6	\$ 2.4	\$ 6.3	\$ 5.85
Present Worth of Future	\$ 14.6	\$ 6.8	\$ 5.8	\$ 2.6	\$ 0.8
Total Capital Present Worth	\$ 14.8	\$ 8.4	\$ 8.2	\$ 8.9	\$ 6.65
<u>O&M Costs</u>					
Initial	\$ 1.1	\$ 1.1	\$ 1.1	\$ 1.1	\$ 1.15
Present Worth of Future	\$ 23.6	\$ 27.7	\$ 26.3	\$ 23.4	\$ 5.0
Total O&M Present Worth	\$ 24.7	\$ 28.8	\$ 27.4	\$ 24.5	\$ 6.15
Total Present Worth	\$ 39.5	\$ 37.2	\$ 35.6	\$ 33.4	\$ 12.8

⁽¹⁾ Utilizes 3.2% for 20 years. Initial Costs are September 2004 dollars. Excludes utility acquisition costs. Based upon comparative alternative costs shown on Tables 5-3 through 5-7 with associated notes. For alternative evaluation purposes. See Section 7 for estimated budgets, etc. Excludes water system costs which are common to all alternatives. Excludes collection system R&R costs which are common to all alternatives.

⁽²⁾ Initial Costs are April 2010 dollars. Capital Cost for Master PS and other associated wastewater system improvements, wastewater capacity fees to Palm Coast, utility acquisition costs, debt service, engineering and contingencies.

Consumer Price Index - Unadjusted

	<u>Sep-04</u>	<u>Apr-10</u>
All Items	189.9	218.009
Percent Change 2005-2010	14.80%	

	<u>#1⁽³⁾</u>	<u>#2⁽³⁾</u>	<u>#3⁽³⁾</u>	<u>#4⁽³⁾</u>	<u>#5⁽²⁾</u>
Total Present Worth April 2010⁽³⁾	\$ 45.3	\$ 42.7	\$ 40.9	\$ 38.3	\$ 12.8

⁽³⁾ Based on September 2004 Present Worth Estimate prepared by HCI and adjusted per the Consumer Price Index change of 14.8% from September 2004 to April 2010, except Alt #5 which is April 2010 dollars

**TABLE 6-2
NON-COST FACTORS
ALTERNATIVE ANALYSIS
Updated 5/2010**

Alternative	Reuse	Pollution Abatement	Energy Efficiency	Operations Security	Customer Acceptance	Implementation	Time Required	Regulatory	Comp Plan	County Value	Total
1	5	5	10	3	6	8	10	0	0	2	49
2	7	8	8	5	7	8	10	5	0	4	62
3	10	7	8	7	7	7	8	9	10	7	80
4	10	7	8	9	9	5	5	10	10	6	79
5	8	9	9	10	8	7	10	10	10	8	89

Scale of 1-10, with 1 being the least advantageous and 10 being the most advantageous.

SECTION 7 PROPOSED PROJECT

7.1 GENERAL

The county has selected alternative #5, which involves a new regional sanitary pump station located on the BBWWTP site. The new regional pump station will replace the existing wastewater treatment and disposal facilities. Wastewater from the Beverly Beach service boundary will be transferred through an interconnect with the City of Palm Coast. The waste will be re-pumped by the City of Palm Coast via their infrastructure, to Palm Coast WWTP #1. The existing BBWWTP will be removed from service and demolished. The water supply portion of this project will remain as a bulk purchase and inter-connect with the City of Palm Coast, with the addition of a new 375,000 gallon potable water storage tank and new parallel water lines within S.R. A1A to improve capacity for fire protection.

Design for the Phase 1 project will be initiated in March 2011, with construction targeted to commence in December 2011 and be completed in October 2012. The project components consist of the following:

- a) Water Capacity - The purchase of an additional 20,000 gpd ADF of water capacity from the City of Palm Coast.
- b) Fire Service Access - The provision of fire hydrants per County Code – *partially completed by Flagler County staff. Additional hydrants will be added as part of this project.*
- c) Water Pressure and Flow Connection - Construction of water transmission mains improving fire flows and solving water pressure problems via an additional, parallel 8-inch diameter transmission system.
- d) Potable Water Storage - 375,000 gallon potable water ground storage reservoir, high service pumping, chemical feed and instrumentation and auxiliary power from the WWTP and alternate service facilities for pressure and fire flow requirements.
- e) Demolition of the Existing WWTP
- f) Wastewater Capacity – The purchase of an initial 60,000 gpd ADF wastewater capacity from the City of Palm Coast.
- g) Construction of the Beverly Beach Regional Pump Station – An initial 200-220 gpm pump station and 6-inch forcemain will be constructed and interconnected with the City of Palm Coast for treatment and disposal.

The Phase 2 program (future and not part of this funding) will consist of:

- a) Additional water capacity purchases from the City of Palm Coast
- b) Inflow and Infiltration Study and Repairs
- c) Pump Replacement as population and customer base increases
- d) System extensions and expansions

7.2 PROJECT SCHEDULE

Table 7-1 provides a summary of the Beverly Beach Water and Wastewater System design, permitting, and construction period schedule for the proposed improvements.

**TABLE 7-1
FLAGLER COUNTY
BEVERLY BEACH WATER AND WASTEWATER SYSTEM**

ACTIVITY SCHEDULE

Description	Date
1. Additional Right-of-Way Survey	March 2011
2. Design Completed	August 2011
3. FDEP / FDOT Permitting	September 2011
4. Bidding and Award	October 2011
5. Commence Construction	December 2011
5. Construction to Substantial Completion of Pump Station and Forcemain	July 2012
6. Final Completion and Certification/Record Drawings (P.S. Operating)	October 2012
7. Water System Improvements (Fast Track)	March 2012
8. Water System in Service	June 2012

* Table 7-2 is not utilized in this report.

7.3 GRAPHIC PRESENTATION OF IMPROVEMENTS

The existing wastewater treatment plant site is shown on the drawings within EXHIBIT 6. The regional pump station and forcemain improvements are also illustrated within EXHIBIT 6. The site plan incorporates a 375,000 gallon potable water storage and high service pumping station. The proposed metered wastewater interconnect is shown on Drawings MP-1 and MP-2 as shown in EXHIBIT 4. The proposed forcemain constructed by Flagler County will be owned and maintained by Flagler County to the interconnect. The meter and the associated forcemain from the interconnect to the new City of Palm Coast lift station will be owned and maintained by the City of Palm Coast.

7.4 TOTAL PROJECT COST ESTIMATE

7.4.1 Construction Cost

The opinion of probable construction costs for the project is shown on Table 7-3. The total construction cost is \$2,717,525. With a 10% contingency of \$271,753, the total construction budget is \$2,989,278.

**TABLE 7-3
FLAGLER COUNTY
BEVERLY BEACH WATER AND WASTEWATER SYSTEM**

Description	Amount
A. Water System	
8" Watermain (Est. 12,000 LF @ \$25/LF)	\$300,000
6" Watermain (Est. 3,500 LF @ \$20/LF)	\$70,000
8" Gate Valves (Est. 24 ea @ \$1,475 ea)	\$33,925
6" Gate Valves (Est. 18 Ea @ \$950 ea)	\$17,100
Fire Hydrants (Est. 24 ea @ \$3,600 ea)	\$86,400
8" Watermain HDD (Est. 2,000 LF @ \$50 / LF)	\$100,000
6" Watermain HDD (Est. 2,000 LF @ \$45 / LF)	\$90,000
Sidewalk Repair and Replacement (Est. 300 SY @ \$50 / SY)	\$15,000
Asphalt Pavement Repair (Est. 1,000 SY @ \$90 / SY)	\$90,000
Right-of-way Restoration	\$10,000
375,000 Gallon GSR and High Service Pumping Station and Chemical Feed with Appurtenances	\$575,000
Water System Testing, Disinfection, Flushing, Clearance	\$15,000
Water System Total	\$1,402,425
B. Offsite Wastewater Collection System	
3 Existing Lift/Pumping Stations and Piping Rehabs	\$225,000
PS Start-up and Testing (3)	\$7,500
Demolition and Removal of existing collection system components	\$7,500
6" Plug Valves (10 @ \$1,200 / ea)	\$12,000
6" Magnetic Meter (1)	\$15,000
Wastewater System Total	\$267,000
C. Wastewater Treatment Plant Decommission	
Demolition	\$80,000
Decommission and Certification	\$10,000
Site Work & Landscaping	\$35,000
Plant Piping Modification for New Pump Station	\$15,000
Wastewater Treatment Plant Decommission Total	\$140,000

D. Master Duplex Pump Station and Forcemain	
Master Duplex Pump Station w/ Controls	\$225,000
Offsite 6" Forcemain (~26,800 LF with fittings and restraints @ \$22 / LF)	\$589,600
6" Forcemain HDD (Est. 800 L.F. @ \$45 / LF)	\$36,000
Contractor "As-Builts"	\$20,000
PS Start-up and Testing	\$7,500
Forcemain Testing and Clearance	\$20,000
Convert Existing Onsite Lift Station to Manhole	\$10,000
Master Duplex Pump Station Total	\$908,100

	Construction Cost Subtotal	\$2,717,525
	10% Construction Cost Contingency	\$271,753
1	Total Construction Cost	\$2,989,278
2	Total Utility Acquisition Cost (July 2004)	\$1,078,000
3	Estimated Loan Interest During Construction	\$190,000
4	Bond Counsel	\$25,000
5	Basic Engineering (KHA and subconsultant fees)	\$132,000
6	Construction Phase Services (Based on RD Table)	\$96,840
7	Construction Permits (Apply for new and modify previously issued)	\$20,000
8	HCI Construction Permits (Previously obtained and applicable to PS project)	\$22,800
9	Preliminary Engineering Report (2005 HCI)	\$22,500
10	Preliminary Engineering Report Update (2010 KHA)	\$12,500
11	HCI's Lab and Geotech Services	\$25,000
12	Additional A1A Geotechnical Borings	\$15,000
13	Environmental Report (2005 HCI)	\$0
14	Environmental Report (2010 KHA)	\$12,500
15	Acquisition Appraisal Update and 125.3401 Hearing	\$7,500
16	Acquisition Services	\$7,500
17	Water Capacity Fees - 20,000 GPD Acquisition (@\$11.30 / gal)	\$226,000
18	Sewer Capacity Fees (Palm Coast) - 60,000 GPD (@\$14.72 / gal)	\$883,200
19	Surveying and Technical Services (HCI previously prepared)	\$51,103
20	Additional A1A ROW Survey (2011 KHA Sub)	\$35,400
21	Total Project Costs:	\$5,851,157

7.4.2 Utility Acquisition Cost

The utility acquisition costs are limited to the approved appraisal amount of \$1,078,000.

7.4.3 Estimated Loan Interest During Construction

This line represents the estimated cost of money loaned (loan interest) during 10-months of project construction. The interest amount is estimated at \$190,000.

7.4.4 Bond Counsel

Bond Counsel will verify that the bonds are legal, valid and binding obligations of the issuer and that the tax status of the debt. Separate Bond Counsel is estimated at \$25,000.

7.4.5 Basic Engineering Fees

The basic engineering fees, excluding construction inspection fees and additional surveying fees, are estimated at \$131,036, which is consistent with the fee table in Florida RUS Bulletin 1780-9.

7.4.6 Construction Phase Service Fees and RPR Support

The construction phase service fees are estimated at \$96,840. The consultant anticipates supplementing and supporting Flagler County staff's resident inspector (RPR) during construction. Consultant will provide support to RPR for project related questions. Consultant will provide a limited number of site visits and construction observation at times of significant construction activities and material installation. The consultant's involvement during the project's construction phase is estimated at a period of 10 months from award of the bid to the project start-up, with periodic weekly site visits during construction.

7.4.7 KHA Permitting (Apply for new and modify previously issued)

Fees associated with applying for new and modifying existing permits for the proposed project construction. Anticipated permits required are:

1. FDEP Water system permit
2. FDEP Wastewater system permit
3. Town of Beverly Beach Building permit
4. Town of Beverly Beach Planning and Zoning permit
5. FDOT Right-of-way / Utility permits
6. SJRWMD Stormwater permit
7. Flagler County Building Department permit

7.4.8 HCI Permitting (Previously Obtained and Applicable)

HCI previously applied for or obtained permits for the previous project described in the HCI PER, that consisted of constructing a new wastewater treatment plant. The permits that were applied for or obtained previously by HCI (as described in HCI's Attachment 2), that are applicable to the current project are the following:

1. Water System permit
2. Wastewater System permit
3. Town of Beverly Beach Building Permit
4. Town of Beverly Beach Site Plan & Zoning Permit
5. Force mains FDEP
6. RAI #2
7. FDEP Stormwater permit
8. SJRWMD Stormwater permit

7.4.9 Preliminary Engineering Report (2005 HCI)

This item is associated with previous PER services conducted for the project by HCI. USDA previously approved HCI's PER fees of \$35,000. Due to the need to update the PER, the resulting HCI fees allowed for USDA reimbursement are \$35,000 less the 2011 KHA PER Update fees of \$12,500 (stated in 7.4.10), which is \$22,500.

7.4.10 Preliminary Engineering Report (2010 KHA)

PER update performed by KHA in 2011 to identify the current project options, schedule, fees, etc. Fees for this service are \$12,500.

7.4.11 Lab, Testing, Geotechnical

This item is associated with previous Lab Testing and Geotechnical work conducted for the project by HCI. Previous fees paid for services are \$25,000.

7.4.12 Additional A1A Geotechnical Borings

This item is associated with the need for additional geotechnical borings within the SR A1A right-of-way that is outside of the previous project's extents. Fees are \$15,000.

7.4.13 Environmental Report (2005 HCI)

This item is associated with previous ER services conducted for the project by HCI. FONSI funds are not applicable to this project.

7.4.14 Environmental Report (2010 KHA)

ER update performed by KHA in 2010 to identify environmental constraints and conditions for the proposed project, which extend outside of the original area identified in the HCI ER. KHA's fees for this service are \$12,500.

7.4.15 Appraisal Update

The Appraisal Update Report of OCU for Rural Development as previously prepared by HCI, \$7,500.

7.4.16 OCU Acquisition Services

Previously accepted amount for acquisition services by Rural Development, per HCI 2005. Acquisition services are \$7,500.

7.4.17 Water Capacity Fees – 20,000 GPD Acquisition

The county currently has 80,000 gpd of bulk water capacity reserved from the City of Palm Coast and will need to acquire an additional 20,000 gpd bulk water capacity by year 2014. The fees for an additional 20,000 gpd of water capacity associated with this project is estimated at \$226,000, per correspondence with City of Palm Coast.

7.4.18 Sewer Capacity Fees (City of Palm Coast) - 60,000 GPD

The county is currently negotiating a bulk wastewater agreement with the City of Palm Coast for an initial 60,000 gpd. The fees for acquiring 60,000 gpd of wastewater capacity associated with this project is estimated at \$883,200 (based on a rate of \$14.72 per gpd as described in Section 5.6).

7.4.19 Surveying and Technical Services (2005 HCI)

The previous acquired survey and associated field work fees by HCI are \$51,103. The survey provided by HCI will be utilized for this project design.

7.4.20 Additional A1A ROW Survey (2011 KHA Sub)

The additional right-of-way survey and associated field work fees are estimated at \$35,400.

7.4.21 Total Project Cost

The total probable project cost is \$5,851,157, which includes a 10% contingency for the project construction costs of \$271,753.

SECTION 8 CONCLUSIONS AND RECOMMENDATIONS

8.1 CONCLUSIONS

2011 Update to the PER: KHA concludes that the best solution to the related environmental problems in the Beverly Beach Water and Wastewater System Service Area and to coastal Flagler County is the implementation of Alternative 5, construction of a regional wastewater pump station and associated forcemain, described in Section 7 of this report. This conclusion is a result of updating the alternatives previously identified and evaluated in the 2005 HCI PER. The conclusions are based on the desire to address the significant problems associated with the tired and outdated BBWWTP, and the wish of Flagler County to no longer operate a wastewater treatment facility. Sending the Beverly Beach wastewater to Palm Coast, will remove a pollution point source from the Intracoastal Waterway, provide a more manageable wastewater system for Flagler County staff, increase the amount of reuse available to the City of Palm Coast WWTP #1, and improve the quality of life to residents, especially those adjacent to the existing BBWWTP.

8.2 RECOMMENDATIONS

2011 Update to the PER: KHA recommends the following:

1. Acceptance of this Preliminary Engineering Report Update and Supplement;
2. Implementation of Alternative 5 described and outlined herein;
3. Inflow/Infiltration Studies on the Beverly Beach wastewater collection system with inspection for system integrity;
4. Negotiations for the purchase of additional 20,000 gpd AADF increments for water supply capacity from City of Palm Coast;
5. Negotiations for the purchase of 60,000 gpd AADF wastewater capacity from City of Palm Coast;
6. Implementation of Alternative 5 as depicted herein and/or as amended over time.