

INFRASTRUCTURE ELEMENT SUPPORT DOCUMENT

I. INTRODUCTION

The purpose of the Sanitary Sewer, Solid Waste, Drainage, Potable Water and Natural Groundwater Aquifer Recharge Element is to ensure the provision of necessary public facilities and services correlated to the future land use projections for the City of Pembroke Pines, to promote the conservation and protection of surface and groundwater resources with the goal of securing future water supplies, and for the preservation and enhancement of the regional ecosystem. The element consists of two parts: (1) The Support Document - A compilation of the Data and Analysis relative to the adequacy of facilities for future growth and development, and (2) The Adoption Document - Goals, Objectives and Policies related to the provision of the above infrastructure requirements. The majority of the adopted changes to the Infrastructure Element consist of updates to both the data and analysis, and the goals, objectives, and policies sections that reflect actual conditions and continuations in policies over the next planning horizons pursuant to the recommendations included in the City's Evaluation and Appraisal Report (EAR), adopted February 2006. In addition, Policies 2.2, 3.4, 4.4, and 5.5 were adopted as recommended by the EAR, and are consistent with the South Florida Regional Planning Council's Strategic Regional Policy Plan (Policy 2.4). Policies 7.7 and 10.6 provide for the City to adopt the Ten Year Water Supply Facilities Work Plan as required by State Statute to increase the coordination between land use and future water supply planning. Adoption of the Ten Year Water Supply Facilities Work plan is required within eighteen months of the adoption of the Lower East Coast Regional Water Supply Plan (adopted February 2007).

The work plan is required to be updated within 18 months after the SFWMD updates the regional supply plan. The SFWMD updated the Lower East Coast Regional Water Supply Plan in September 2013; therefore, the City is required to adopt the updates by March 2015. The updates include text amendments to the Future Land Use, Infrastructure and Conservation Elements and the City's 10 year water supply facilities work plan which was adopted by the City Commission in 2009 (Ordinance No. 1632). Updates were made to IE Policies 7.7 and 9.5. The SFWMD updated the Lower East Coast Regional Water in November 2018; therefore the City is required to adopt the updates by May 2020; however, due to Covid-19, the City's work plan was delayed. The updates for 2020 include text amendments to the Future Land Use, Infrastructure and Conservation Elements as well as the City's 10 Year water supply facilities work plan. The majority of changes were related to updating the planning horizons.

This element is divided into subsections as follows:

- A. Sanitary Sewer
- B. Solid Waste
- C. Drainage
- D. Potable Water Supply and Water Resource Management Coordination
- E. Natural Groundwater Aquifer Recharge

The Data and Analysis section is located within the Support Document in the beginning part of the element and is provided for each subsection. The Adoption Document will follow the Support Document. The Sanitary Sewer, Drainage, and Potable Water Supply and Water Resource Management Coordination subsections each contain a policy which provides for the City to continue to update its maps on an as needed basis (see IE Policies 2.15, 5.6 and 8.10). Map No's IE-1 (Sanitary Sewer, Potable Water, and Solid Waste Facilities) and IE-2 (Drainage Facilities) are located in the IE - Appendix - Maps - Pages 1 and 2 respectively. All subsection objectives are followed by an evaluation measure.

The Data and Analysis has been submitted with respect to the annexed and de-annexed properties adjacent to Laguna Isles in the northwestern portion of the City of Pembroke Pines during the 2008 amendment cycle and is pending completion of the Chapter 163 process. All annexed property data and projections for the next planning horizons are included in the 10 year Water Supply Facilities Work Plan (Tables 2-7 and 2-4).

The 2002, 2004, and 2005 legislatures established a process for water supply planning, amending Chapters 163 and 373, F.S., to improve the coordination of water supply and land use planning. Senate Bills 360 and 444 strengthened the statutory linkage between the regional water supply plans prepared by the water management districts and local government comprehensive plans. The City of Pembroke Pines falls within the Lower East Coast Regional Water Supply Plan area and is required to ensure that adequate water supplies will be available to meet future demand by developing a 10-year water supply facilities work plan (WSFWP). The WSFWP includes alternative water supplies, water reuse and conservation programs as required by State Statute, and are incorporated into the City's Comprehensive Plan through the Potable Water Supply and Water Resource Management Coordination sub-element of the Infrastructure Element. Amendments have been made to the goals, objectives, and policies and data and analysis sections of the this element, along with Future Land Use, Conservation, Capital Improvements, and Intergovernmental Coordination Elements addressing water supply planning requirements. Cross-reference notations have been added for all applicable amendments to the elements' goals, objectives and policies sections.

Changes to this element include an update of the existing goal, proposed Objective IX (cross reference – updated existing FLU Objective X), proposed Evaluation Measure for Objective IX, proposed Policies 9.1, 9.2, 9.3 (cross reference FLU Policy 10.6, CE Policy 2.18 and ICE Policy 1.9), 9.4, 9.5, 9.6, 9.7, and 9.8 (cross reference

FLU Policy 11.13, ICE Policies 1.9 and 2.11). IE Policies 9.9 and 9.8 were modified in response to DCA's Objection, Recommendation and Comment report dated August 6th, 2008. Policy 9.9 was added in response to DCA's Objection, Recommendation and Comment report dated August 6th, 2008. Previously adopted Objective IX, its Evaluation Measure and Policies 9.1 through 9.6 have been renumbered as Objective X, and Policies 10.1 through 10.6. Proposed Policy 10.7 has been added under Objective X (cross reference CE Policy 2.17). Policies 7.6, 10.5, and 10.6 (cross reference FLU Policy 10.6, IE Policy 9.3, CE Policy 2.18, and ICE Policy 1.9) have been updated. Existing Policies IE 5.3, 5.8, Objective VIII, and existing policies 8.1 through 8.10 are consistent with water supply planning requirements. The proposed WSFWP has been incorporated within this element (See Appendix – Water Supply Facility Work Plan

SFWMD updated the Lower East Coast Regional Water in November 2018; therefore the City is required to adopt the updates by May 2020; however, due to Covid-19, the City's work plan was delayed. The updates for 2020 include text amendments to the Future Land Use, Infrastructure and Conservation Elements as well as the City's 10 Year water supply facilities work plan. The majority of changes were related to updating the planning horizons. The City is updating the Future Land Use, Conservation, and Infrastructure adoption elements along with the updated WSFWP. The WSFWP will be incorporated within the Infrastructure adoption element as well as the support element. No alternative water supply improvements were necessary as the adopted level of service will be maintained through the year 2040.

Service Area. The Infrastructure Element service area consists of the entire City of Pembroke Pines.

Planning Horizons. The Infrastructure Element planning horizons are 2020 and 2030.

II. DATA AND ANALYSIS REQUIREMENTS

A. Sanitary Sewer

The provision of wastewater disposal within the City of Pembroke Pines is divided into two segments: eastern Pembroke Pines, serving that area east of Flamingo Road; and western Pembroke Pines, serving the balance of the community west of Flamingo Road. The operational responsibilities for the treatment and disposal of wastewater continue to be shared between two cities. The eastern portion of Pembroke Pines is served by the City of Hollywood regional facility. The balance of the City of Pembroke Pines is served by a facility which is owned and operated by the City of Pembroke Pines. The collection infrastructure is owned and maintained by the City of Pembroke Pines except for a portion of southeastern Pembroke Pines

which is served by Broward County Utilities. As stated earlier, the Sanitary Sewer, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge subsections contain policies which provide for the City to continue to update its maps on an as needed basis to delineate facilities and service areas (see IE updated Policies 2.15, 5.6, and 8.10). Map No's IE-1 (Sanitary Sewer, Potable Water, and Solid Waste Facilities) and IE-2 (Drainage Facilities) are located in the IE - Appendix - Maps on Pages 1 and 2 respectively.

Table 2-7 provides an analysis of facility capacity based on projected demand for both the short term and long term planning horizons. Data and analysis that includes updated existing and projected need tables for the annexed and de-annexed properties in the northwestern portion of the City (adjacent to Laguna Isles) is included in the WSWFP as required by Florida Statutes. Table 2-7 also identifies the five year per capita flow projected to occur utilizing the level of service standards. These level of service standards are in conformance with the design capacities of the plants including their projected/programmed improvements providing sufficient design capacities and levels of service through the year 2030.

Data on Per Capita Flow and future plant improvements are identified in the Ten Year Water Supply Facilities Work Plan. The City of Pembroke Pines Plant is relatively new having been constructed in the mid-1980's. The expected life of both plants is well beyond the year 2030 horizon. Impacts to natural resources continue to be minimal. The Hollywood Plant utilizes secondary treatment prior to discharge through ocean outfall which then disperses in the Gulfstream. The Pembroke Pines Plant uses secondary treatment with deep well injection into the Florida Aquifer which is a salt-water aquifer below the boulder zone at a depth of 2,000-3,000 feet.

The City anticipates continued opportunity for the proper growth and development of the few remaining vacant parcels in the community over the next 10 – 15 years. The City installed, as previously noted, water and sewer facilities extending out to U.S. 27, and in 1983, passed a resolution which limits the issuance of permits for septic tanks. The City has taken great strides to provide water and sewer service for its entire community well in advance of the development of a significant portion of the community. Addressing the services in this manner will continue to provide for a safer and higher quality environment and greater protection to the natural resources occurring within the community and surrounding communities.

According to the 1995 EAR, the overall infrastructure and treatment characteristics of the Pembroke Pines wastewater treatment system remained in place since the 1990 adopted Comprehensive Plan. Wastewater generated by development east of Flamingo Road is treated by the City of Hollywood's system. Most of the area served by the City of Hollywood was developed prior to 1990, and little land remains available for future growth. Higher growth areas of the City are served by the City of Pembroke Pines treatment plants located west of Flamingo Road.

When the last plan was adopted, the 2010 average MGD or projected wastewater demand was 5.3 mgd for the City's wastewater treatment system. According to Table 2-7, the 2010 projected wastewater demand is 6.96 MGD. As of September 1995 there were five treatment facilities located at a single site west of Flamingo Road. Total treatment capacity at these facilities was 9.5 million gallons per day (mgd), and is currently 9.5 MGD.

Effluent is treated to secondary standards and is disposed of in deep wells. Currently the deep well capacity is 9.5 mgd, with an additional 14.5 mgd available as back-up disposal capacity. Sludge is hauled away by an independent contractor for disposal on sod farms. There are no plans to change either the level of treatment or the method of effluent disposal.

Currently, the City is treating an estimated 6.65 mgd, up from 5 mgd in 1999. At the present time, and for the horizon of the plan, the City of Pembroke Pines has adequate sewage treatment capacity. Effluent disposal is expected to continue in deep wells.

The existing water treatment plant has a rated capacity of 18.0 million gallons per day (MGD). Six total MGD treatment capacity were added (2020 WSFWP). Total amount of wastewater for both the eastern and western portions of the City is approximately 14.49 MGD.

There is one other component of treatment which continues to occur within the City to a small degree.

Septic Tanks

The three areas within the City which presently have septic tanks contain four different soil types. The far western portion of the community where four or five single-family homes are on septic tank is the Lauderhill Muck type of soil. This soil has severe limitations due to depth of rock, ponding and poor filtering to be utilized for septic tank absorption fields. Lauderhill and Dania Muck soil types also exist in the western portion of the City. Dania Muck has severe limitations due to depth of rock and ponding. The other area of the City is the older portion of the community where the soil types are Immokalee, Limestone Substratum - Urban Land Complex and Immokalee - Urban Land Complex. These soils typically have severe limitations for septic tank absorption fields due to wetness. As previously noted, by resolution approved February 7, 1983, the City of Pembroke Pines allows no new septic tanks within the community as water and sewer services have been installed and are available to all residents of the community. However, the annexed residential areas have been allowed to retain their septic tanks while the industrial area was required to connect to sewer. The existing septic tanks are operating in a satisfactory manner and there are no existing deficiencies or problems

occurring with the existing facilities, which represent a small component of the wastewater treatment facilities within the community.

Septic tank systems remain in use at several locations in the older section of Pembroke Pines. Septic tanks are located in areas where soil limitations make the land unsuitable for such systems. Septic systems have been restricted in the City since 1983; therefore, most of the developed area in Pembroke Pines is served by the sewer system. IE Policies 2.10, 2.11, FLU Policy 10.3, and CE Policies 2.8 and 2.9 were updated pursuant to the 2006 EAR recommendations and as recommended by the City of Pembroke Pines Local Planning Agency during the EAR amendment public hearing.

IE Objective I, Evaluation Measure for Objective I, and Policy 1.1 emphasize maintenance of the current level of service. IE Policies 1.3 and 1.4 provide for monitoring and assessment in 2010 and 2015. IE Policy 2.2 was updated to reflect that decisions regarding the location of infrastructure investments are made with priority for the lowest income neighborhoods as recommended by the EAR (2006) and consistent with South Florida Regional Planning Council's Strategic Regional Policy 2.4. IE Policies 2.5, 2.6, and 2.7 are consistent with FLU Policies 7.2, 7.3 and 7.5. IE Policy 2.14 was updated to provide for the City to incorporate into the Intergovernmental Coordination Element all of the objectives and policies which call for coordination with other governmental entities. Table ICE-4 of the adopted Intergovernmental Coordination Element will incorporate by reference the appropriate objectives and policies pursuant to IE Policy 2.14 during the amendment cycle following adoption of the EAR Amendments.

B. Solid Waste

Solid waste generated in Pembroke Pines is collected by All Service Refuse, Co., a private solid waste hauler. It is collected twice weekly at the curb and hauled to the Reuter facility located in western Pembroke Pines. This facility serves as a transfer facility, with provision for sorting of recyclable materials. Solid waste is disposed of at the Okeechobee Landfill by Reuter. The Reuter contract is in effect until January 2022. The City's contract with All Service Refuse for collection services runs until April 2013, with an option to renew.

The Reuter Recycling Facility has a design capacity of 5,600 tons per day, 168,000 tons per month, or 2,044,000 tons per year. Current demand on this facility totals 1,500 tons per day, or 45,000 tons per month or approximately 27 percent of design capacity. The Okeechobee landfill has adequate capacity for a minimum of 50 years and can accept 5,000 tons per day. Currently, the landfill accepts 3,800 tons per day with a level of service of 5 lbs/capita/day. In 2005, per capita solid waste collection increased to 120 pounds per month. The Reuter Inc. plant was constructed under full compliance with all Florida Department of Environmental

Protection standards, and as previously noted, is a transfer facility which will provide the recycling of all waste within the community.

IE Objective III was updated for the new planning horizons. IE Policies 3.4 and 4.4 were updated to reflect that decisions regarding the location of infrastructure investments are made with priority for the lowest income neighborhoods as recommended by the EAR (2006) and consistent with South Florida Regional Planning Council's Strategic Regional Policy 2.4. IE Policy 4.9 was updated for the new planning horizons pursuant to the recommendation of the EAR (2006) and is consistent with FLU Policy 7.5.

The City of Pembroke Pines initiated a newspaper recycling program in August 1989. Paper for recycling is collected weekly at the curb. The City's recycling activities also include the collection of plastic, aluminum, steel, and glass which are hauled by All Service Refuse to the Reuter transfer station in the City of Pembroke Pines. In 1994, 4.05 pounds of paper per person was collected. In 1995, recycling has increased slightly to 4.09 pounds per person per month. IE Policy 4.2 provides for the City to establish and implement a citywide recycling education program by 2010 to achieve the State of Florida's 30 percent waste reduction target. Data on current recycling collection amounts was not available during this amendment cycle for the EAR amendments. The data will be updated during the next amendment cycle which follows the availability of the updated data.

C. Drainage

1. Overview

Drainage is administered via a five-agency process, including the City of Pembroke Pines Environmental Services Division; the South Broward Drainage District; the Central Broward Water Control District; the Broward County Water Management Division; and the South Florida Water Management District. The Intergovernmental Coordination Element of this plan addresses the various roles of the Broward County Water Management Division, the South Florida Water Management District, the South Broward Drainage District, the Central Broward Water Control District, and the City's Environmental Services Division (See IE Policy 5.7). The City Engineer's office primarily insures that the drainage systems within each development are in conformance with acceptable local standards and practices. The Central Broward Water Control District and the South Broward Drainage District, formerly known as the Hollywood Reclamation District, are the regional drainage districts responsible for the primary drainage within Pembroke Pines.

The South Broward Drainage District includes approximately 70 land sections of property or approximately 46,000 acres. It is generally bounded on the west by the conservation levee. Sheridan Street forms the northern boundary of the majority of

the district while Griffin Road serves as the northern boundary of all lands west of 148th Avenue. The southern boundary is the Dade/Broward County line and the eastern boundary is the combination of University Drive, Southwest 68th Avenue and Southwest 72nd Avenue. All of the City of Pembroke Pines is situated within the South Broward Drainage District except for a portion of the northeastern part of the City (bounded on the north by Sheridan Street, on the south by Taft Street, on the west by University Drive and on the east by SW 72nd Avenue – also known as the Walnut Creek development) which is situated in the Central Broward Water Control District, and a portion of the southeastern part of the City (including the southern half of Sections 14, 51, 41 and the northwest corner of Sections 23, 51, 41) which are under the Broward County Water Management Division. The Drainage Map will continue to be updated pursuant to the Broward County maps on an as needed basis in accordance with IE Policy 5.6. Map No IE-2 (Drainage Facilities) is located in the IE - Appendix - Maps section - Page 2.

IE Policy 5.5. has been updated to provide for the city to coordinate with the Drainage Districts' decisions regarding the location of infrastructure investments so that they are made with priority for the lowest income neighborhoods, consistent with South Florida Regional Planning Council's Strategic Regional Policy 2.4. IE Policy 5.4, was updated for the new planning horizons. IE Policy 5.7 provides for the City to update the Intergovernmental Coordination Element and Table ICE-4 after the adoption of the EAR amendments for those objectives and policies calling for coordination among other governmental agencies during the next amendment cycle following the update.

2. Land Uses

The land uses within the region consist of a variety of vacant, residential, commercial, and industrial lands as further outlined on the Future Land Use Plan map for the City of Pembroke Pines. All of the City of Pembroke Pines is within the South Broward Drainage District with the exception of 40 acres of commercial and 20 acres of office situated at the S.E. corner of Sheridan Street and University Drive, and 265 acres of a residential Planned Unit Development formally known as the Waldrep Dairy property (Walnut Creek) located between University Drive and SW 72nd Avenue, and between Taft Street and Sheridan Street. This part of the City is situated within the Central Broward Water Control District. Also, the areas east of the North Perry Airport and south of Pines Boulevard are situated within the Broward County Water Management Division Drainage District. All of these properties are also fully developed and fully served by the existing drainage system in that area. In accordance with FLU Policy 12.11, data on the recently annexed and de-annexed properties in the northwest portion of the city will be submitted during the next available amendment cycle. Data on the annexed areas has already been submitted and adopted.

3. Existing Facilities

In July 1998, South Broward Drainage District updated its Stormwater Facilities Report and the District continues to complete upgrades and make changes as outlined in the Facilities Report. There are no existing flooding conditions within the City. In the event flooding problems develop, the City of Pembroke Pines Environmental Services Division receives drainage concerns from homeowners in developed areas of the community and each concern is logged and plotted on a map of the City. An Environmental Services Division inspector will also be dispatched to the area of concern to document the extent and severity of the flooding problem. If it becomes apparent that a specific area has a severe flooding problem, then the City Engineer will request authorization from the City Manager to prepare a drainage study for the specific area. The drainage study will involve a solution to the problem and a cost for the improvement. The City Manager will then include the improvement in the following fiscal year's capital improvement budget which will be authorized by the City Commission, or as an alternative means of funding, a special assessment district will be formed whereby the benefiting property owners are assessed for the proposed drainage improvement.

After the funding mechanism is established, construction plans will be prepared under the direction of the City's Environmental Services Division. The construction plans will be bid competitively and the City Commission will award the project to the most responsive bidder. The drainage improvement will then be constructed. Minor drainage improvements such as dry wells will be installed by the City Public Works Division at the direction of the City Manager.

The existing facilities within the district include eleven north/south main canals which are approximately 39 miles in length district-wide. Five of these canals extend from Pines Boulevard south to the C-9 canal; five of these canals extend from the north boundary of the drainage district to the C-9 Canal; and one canal extends from the C-11 south to the C-9 canal. A borrow ditch exists on the west right-of-way line of U.S. Highway 27 and extends from the C-11 to the C-9 canal. There are several east/west lateral canals within the eastern 1/3 of the drainage district. A Drainage Facilities map has been updated indicating secondary canals, primary canals and related facilities within the City of Pembroke Pines (See IE Policy 5.6). Map No IE-2 (Drainage Facilities) is located in the IE - Appendix - Maps section - Page 2.

The portion of the City of Pembroke Pines lying within the South Broward Drainage District includes all of Pembroke Pines lying west of University Drive and portions lying east of University Drive. All primary major drainage facilities in this area are owned, operated and maintained by the South Broward Drainage District, an independent special district of the State of Florida. The primary drainage facilities consist of north-south canals and are further identified as follows:

- A. Canal No. 1 a/k/a University Drive Canal
- B. Canal No. 2 a/k/a Palm Avenue Canal
- C. Canal No. 3 a/k/a Flamingo Road Canal
- D. Canal No. 4 a/k/a 148th Avenue Canal
(South of Pines Boulevard)
- E. Canal No. 7 a/k/a 196th Avenue Canal
(South of Pines Boulevard)

- F. Canal No. 8 a/k/a 208th Avenue Canal
(South of Pines Boulevard)
- G. Canal No. 9 a/k/a Borrow Ditch Canal lying west of U.S. 27
- H. Canal No. 12 (West of 184th Avenue, north of Sheridan Street)
- I. Canal No. 13 (West of 196th Avenue, north of Pines Boulevard)
- J. Canal No. 14 (East of 208th Avenue, north of Stirling Road)
- K. Canal No. 15 (West of US 27, north of Pines Blvd.)

The three eastern canals (Nos. 1-3) extend over the entire width of Pembroke Pines and are controlled by South Broward Drainage District pump stations located within the City of Miramar and north of the South Florida Water Management District Canal C-9 a/k/a Snake Creek Canal. The 148th Avenue Canal (No. 4) extends from Pines Boulevard south through the City of Miramar to the South Florida Water Management District Canal C-9 and is also controlled by a pump station located north of the Snake Creek Canal in the City of Miramar.

The two primary canals east of U.S. 27 and south of Pines Boulevard (Nos. 7 & 8) have been constructed from the Snake Creek Canal north to Pines Boulevard and these canals are connected directly to the South Florida Water Management District Canal C-9. Canals 5 and 6 have been absorbed into the lake system of development in this area and no longer exist. Construction of two new pump stations at 172nd Avenue and South Florida Water Management District's C-9 right-of-way (S-4 and S-5 Pump Stations) was completed in 2001. This station services SBDD Basins 4 and 5 and eliminates gravity connections to C-9, west of I-75 and south of Pines Boulevard. Canals 12 through 14 extend north from Pines Boulevard to the South Florida Water Management District C-11 Canal north of Griffin Road and drain the area north of Pines Boulevard and west of I-75. Those areas of Pembroke Pines which lie west of U.S. 27 drain into the Borrow Ditch Canal lying west of U.S. 27 which drains both north and south into the C-11 and C-9 Canals respectively.

The secondary drainage facilities located within the City of Pembroke Pines consist of interconnecting east-west canals or lakes which directly connect into the primary canals. The secondary canal and lake systems are also operated and maintained by the South Broward Drainage District. The secondary drainage systems are either owned directly by the South Broward Drainage District, or the South Broward Drainage District has a drainage, canal, lake and/or flowage easement over same.

Those areas of Pembroke Pines which lie north of Pines Boulevard and between I-75 and Flamingo Road including C.B. Smith Park, are presently permitted to discharge directly into the Flamingo Road Canal; and the property known as Pembroke Falls lying east of I-75 and north of Pines Boulevard also drains into the District's Flamingo Road Canal.

All secondary drainage facilities east of Flamingo Road on the north side of Pines Boulevard and all secondary drainage facilities south of Pines Boulevard lying within the South Broward Drainage District are designed to drain into the primary canals (Canal Nos. 1-9). The drainage capacity of these canals is limited by the South Florida Water Management District criteria. The current criteria for all of the drainage facilities are in accordance with those of the applicable drainage districts and the South Florida Water Management District. For those areas lying north of Pines Boulevard and west of Flamingo Road, there is presently a 3,800 gallon per minute pump station which provides drainage for C.B. Smith Park.

South Broward Drainage Basins S-9 and S-10, west of SW 172nd Avenue and north of Pines Boulevard, are drained by the three gravity canals, Canals 12, 13, and 14. The maximum allowable discharge into the South Florida Water Management District's C-11 Canal (South New River Canal) is 1 1/4 inch per day. The basins meet the level of service "C." The design capacities into the C-9 Canal of 3/4 inch per day is the equivalent of 20 cubic feet per second per square mile of property drained and the design capacity of the C-11 Canal of 1 1/4 inch per day is the equivalent of 33.3 cubic feet per second per square mile of property draining into the South Florida Water Management District canals. In addition, the canal cross-sections of the South Broward Drainage District are designed in accordance with the peak run-off formula as stated above.

The drainage capacities for Canal Nos. 1, 2, 3, and 4 exceed the current demand on the drainage facilities since not all areas of the South Broward Drainage District lying within the property which drains in these canals have been completely developed. In addition, since the actual flow which can be achieved in these canals is limited by the pump stations, which are permitted in accordance with South Florida Water Management District criteria, the current demand or required allowable run-off from the property draining into these canals is less than that which is provided by the South Broward Drainage District. For those areas lying south of Pines Boulevard and west of I-75 which do not drain into Canal No. 4, development has also not been completed. Since these canals all have a capacity greater than the allowable discharge into the South Florida Water Management District's C-9 Canal, the current demand is less than that which is provided.

The allowable discharge for the Chapel Trail property which includes portions of property not in Chapel Trail lying west of 184th Avenue is limited by the South Florida Water Management District's C-11 Canal allowable discharge of 1 1/4 inch per day

and thus the current demand on this facility is less than that which is provided since the area has not yet been fully developed.

The level of service of the drainage facilities is based upon the 10-year, 3-day storm event for minimum road crowns and the 100-year, 3-day storm event for minimum building pad elevations. The goals, objectives and policies further define and outline the level of service standards to be met for development within the area.

For those areas lying north of Pines Boulevard and west of Flamingo Road, except for C.B. Smith Park and Pembroke Falls, all property is planned to drain north to the South Florida Water Management District's C-11 Canal through either the existing or proposed canals which will be constructed on the property lying north of the City limits of Pembroke Pines, and which will also be controlled by pump stations which will limit the drainage from these areas to 1 1/4 inch per day. The SBDD has completed the following elements of the Basins S-9 and S-10 Stormwater Improvement Project: Cemetery Trail Canal, Weekley Ditch, Plugging 3 westerly outfalls to the C-11 Canal, SW 205th Avenue culvert replacement, Canal 13A culvert replacements, Canal 13A Control Structure, and 184th Avenue 72" culvert. The following design elements are under construction and will be completed during the summer of 2008: Canal 13 Control Structure, and Stirling Road Connector Canal. The remaining design elements will be constructed during fiscal year 08/09: Canal 12 Control Structure, Canal 12 culvert replacements, and FPL Connector Canal. The projected demand on the drainage facilities cannot exceed that which is limited by the South Florida Water Management District allowable discharge into the C-9 Canal of 3/4 inch of runoff per day and the C-11 Canal runoff limitation of 1 1/4 inch of runoff per day. This allowable discharge cannot be exceeded regardless of the ultimate development of the areas being drained.

According to the South Broward Drainage District, the Alton and Stoneridge properties are served by Basin 8 and the S-8 Pump Station which was installed in 1996. In addition, with the improvements installed in 1996, the adopted level of service continues to be maintained. Future drainage planning improvements will be depicted on the Drainage Plan for the City (see IE Policy 5.6). All criteria will be those established and updated by applicable drainage districts.

The area west of U.S. 27 acts as a catchment area for seepage through and under the South Florida Water Management levee on the eastern edge of the Conservation Area. There have been no improvements contemplated within this region because of the expectation that it will be maintained in an agricultural low-density posture. The South Broward Drainage District has proposed no improvements to the area west of U.S. 27 and the Borrow ditch lying west of U.S. 27 provides drainage of this property to both the C-9 Canal and C-11 Canal.

The general performance of the existing facilities, based upon the best available data and the operations of the drainage districts, indicates a very acceptable level of

service being provided by the facilities. The general condition of the facilities is very good and the expected life of the facilities is long term. The manner in which the construction and improvement of the drainage facilities has occurred within the districts has been one that has limited the impacts to natural resources.

The pump stations for Canal Nos. 1, 2 and 3 have been constructed within the past fifteen years. At this time, there are no plans for any replacement, expansions, or relocation of these facilities. The pump station for Canal No. 4 has been in place for approximately twenty years and provides for all permitted and required drainage into Canal No. 4. The District completed several upgrades for this pump station in 2000. The location of the S-3 Pump Station will not change.

The South Broward Drainage District has prepared and updated a Master Water Control Plan as prepared by Calvin, Giordano & Associates, Inc., July 1998. This plan provides full protection to all lands within the District and has been prepared based upon the last criteria adopted by the South Florida Water Management District. The drainage district has always enjoyed an adequate level of service for providing this needed protection for the lands within its jurisdiction. Its existing facilities have performed adequately and are in good condition and, with general maintenance, are expected to provide long-term benefits to residents within the District. Existing regulations and programs outlined by the District maintain the functions of the natural drainage and groundwater recharge requirements of the area.

The South Broward Drainage District periodically has samples of water within the water bodies within the District tested, and this analysis indicates that for those parameters which are tested, there are no adverse conditions existing.

D. Potable Water Supply and Water Resource Management Coordination

The City of Pembroke Pines Water Treatment Plant provides potable water for the entire City of Pembroke Pines. The design capacity of the City's system in 2007 is 18 mgd. and the maximum day demand is 15.82 MGD in 2020 with a peak demand of 16.09 MGD in 2040. The level of service for these facilities meets current standards and provides an adequate supply of water for the existing and projected population of the entire City of Pembroke Pines.

Table 2-4 identifies the Utility Division's anticipated growth trends within the service area of the water plants which serve the entire City. It also identifies the per capita usage projected to occur utilizing the level of service standards updated in the Potable Water subsection of the Infrastructure Element (See IE Policy 7.6). IE Policy 7.6 reflects a level of service standard of 80.52 gallons per capita per day. The previously adopted level of service was 106 gallons per capita per day. These level of service standards are in conformance with the design capacity of the plant, including the projected and/or programmed improvements. Table 2-4 demonstrates that sufficient design capacity and levels of service will be available through the year

2040. No shortfalls in water supply are projected through 2040. The Ten Year WSFWP which includes additional data and analysis of the alternative water source project and future capacity is incorporated within this element (see Appendix – 10 Year Water Supply Facility Work Plan).

The level of service change based on the data of the WSFWP has been identified within updated IE Policy 7.6 of the Potable Water subsection of the Infrastructure Element. Both the current and projected level of service in the community is adequate for potable water facilities.

The level of service as identified above demonstrates a sufficient level in accordance with the Comprehensive Plan. The condition of the water plants is very good and the expected life of the plant is well beyond the year 2030. Impacts to natural resources are minimal and the withdrawal is monitored closely by the permit with the South Florida Water Management District.

There are a few individual water wells existing in the area of Southwest 196th Avenue where previously noted septic tanks are situated for large lot developments in that area. However, once the water lines are installed in this area, these residents will be required to hook up to the City's potable water system (see IE Policy 8.6). The supply of water for these small areas utilizing water wells is adequate in quantity and quality to meet federal and state standards. These facilities are monitored and permitted by the Broward County Health Department, which is an agency of the State of Florida.

Updates to the Potable Water section under Objective VII included modifying Policy 7.3 to provide that decisions regarding the location of infrastructure investments are made with priority for the lowest income neighborhoods consistent with the South Florida Regional Planning Council's Strategic Policy 2.4. Policy 7.7 has been updated to provide for the adoption of the 10-Year Water Supply Facilities Work Plan within 18 months after the adoption of the regional water supply plan as required by State Statutes. Objective VIII, Evaluation Measure for Objective VIII, and Policy 8.9 are modified for the new planning horizons. Policy 8.10 is modified to provide for continual updates to the infrastructure map on an as needed basis. The 2020 updates includes modifications for the new planning horizons as well as the updated Level of Service for potable water.

E. Natural Groundwater Aquifer Recharge

The City of Pembroke Pines supports and complies with the Broward County Wellfield Protection Ordinance and the expansion of wellfields to provide potable water service for the future residents of Broward County including the City of Pembroke Pines. Water Wellfields and Wellfield Protection Areas have been identified on Map No. FLU-2, Water Wellfields and Wellfield Protection Areas (FLU Appendix-Maps) in accordance with the Broward County Map series. In addition, the

City adheres to strict guidelines and standards for the pre-treatment of all stormwater discharge prior to discharge into the primary drainage system of the community in accordance with the criteria of the South Florida Water Management District, South Broward Drainage District, Central Broward Water Control District, City Environmental Services Division, and the Broward County Department of Planning and Environmental Protection. These pre-treatment standards continue to help insure that the aquifer is maintained to acceptable standards.

The South Florida Water Management District has not designated any area within the City as a "prime groundwater recharge area," and therefore, Map No. IE-1 (Infrastructure Map) does not reflect groundwater recharge areas. The major source of recharge to the Biscayne aquifer, which is the sole source aquifer serving Pembroke Pines and Broward County, are the Everglades Water Conservation Areas. The three water conservation areas west of the City total approximately 800 sq. miles. Recharge occurs naturally as storm water, which is stored and purified in the conservation areas before seeping into the aquifer.

Other major sources of recharge within the City include the canal system and the land surface. Through the incorporation of Best Management Practices (BMP's) during the design stages of development of projects, the City further ensures enhancement of the quality of water which percolates into the aquifer. As noted in the topography subsection of the revised Data and Analysis section of the Future Land Use Element, the elevations within the community are very slight and only range from 5 ft. to 9 ft. MSL.

During the EAR sufficiency review in 1995, conducted by the South Florida Regional Planning Council (SFRPC), a recommendation was made to add a discussion and data regarding the effects of saltwater intrusion on groundwater resources, wellfield capacities, and levels of service. In addition, the SFRPC indicated the EAR did not contain an assessment and evaluation of whether the wellfield protection ordinance adequately provides and maintains the level of service standards, or the status of water quality in the City's wellfields. IE Policy 10.5 has been modified to address the SFRPC's recommendations by identifying the City's role as one of coordination only in the implementation of standards that have been adopted by the various Broward County agencies that play a primary role in the protection of groundwater resources. The City has included an assessment and evaluation discussion per the above in the Ten Year Water Supply Plan (see CE Policy 2.13). IE Policy 10.4 was adopted to reflect the incorporation of all the updated IE objectives and policies into the ICE during the amendment cycle following the update. Table ICE-4 of the Intergovernmental Coordination Element will also be updated pursuant to IE Policy 10.4.

