SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Appendices





UPPER EAST COAST
WATER SUPPLY PLAN UPDATE

2011

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Demand Projections

> **NOTE**
>
> Perceived discrepancies in table totals are due to rounding.

The South Florida Water Management District (SFWMD or District) completes the complex process of water demand projection in coordination with staff from local governments, utilities, other agencies, and stakeholder groups. This appendix provides the methods and detailed water demand projections developed for the *2011 Upper East Coast Water Supply Plan Update* (2011 UEC Plan Update). The water demands in the 2011 UEC Plan Update are analyzed in two ways, net and gross demand. Gross demand is the water allocated in a consumptive use permit, and is the volume of water withdrawn from the system. Gross demand includes the water needed for the use, as well as the water lost to treatment/process losses and system inefficiencies. Net water demand, commonly referred to as finished water demand, is the volume of water needed to meet the consumption demands of end users.

Previous water supply planning efforts did not distinguish between net and gross water demands. The approach detailed in this appendix addresses situations in which net and gross demands differ. For example, with urban demands, a large percentage of new finished water demands are met using brackish water sources. Raw water withdrawals from brackish water sources are normally 20–25 percent higher than for a like amount of finished water from freshwater sources, due to losses incurred during associated treatment processes.

This UEC Demand Projections appendix presents water demand assessments for the following six water use categories:

- Public Water Supply (PWS)
- Domestic Self-Supply (DSS)
- Industrial/Commercial/Institutional Self-Supply (ICI)
- Recreational/Landscape Self-Supply (REC)
- Power Generation Self-Supply (PWR)
- Agricultural Self-Supply (AGR)

The Public Water Supply (PWS) category encompasses potable water supplied by water treatment facilities with average production rates greater than 0.1 million gallons per day (MGD). The PWS systems, both public and private, supply potable water to all types of customers and land uses. Within the PWS category, net demand refers to finished water demand and is measured by the amount of water leaving a treatment facility.

The other five water use categories are self-supplied. Domestic Self-Supply (DSS) includes utilities whose average flow is less than 0.1 MGD and households whose source of potable water is a single private well. Industrial/Commercial/Institutional (ICI) Self-Supply refers to self-supplied business operations and institutional operations, such as schools and hospitals. Recreational/Landscape (REC) Self-Supply includes irrigation demands for large landscaped areas, such as community and homeowner association common grounds, ball fields, parks, cemeteries, and golf courses. The Power Generation (PWR) Self-Supply category is water used at power plants primarily for cooling purposes. Agricultural (AGR) Self-Supply includes water demands for crop irrigation.

DATA SOURCES AND METHODS

This section briefly describes the kinds and sources of data used to develop water demand estimates and projections for the 2011 UEC Plan Update. Specific dataset sources, analysis methods, and application for projections are given within each use category's *Projection Methodology* section.

In general, the preparation of reasonable estimates and projections of population and certain land use activities are basic to calculating water demands, as is the development of appropriate use factors. For example, estimates of irrigated acreages (as a use factor) are fundamental to projecting water supply demands for the Agricultural and Recreation/Landscape Self-Supply categories. Data sources for each category may include the U.S. Census, municipal planning documents, and statewide reports.

The *Projection Results* section within each use category presents water demand base-year estimates for 2005 and projections through Year 2030 in five-year increments for average rainfall and 1-in-10 year drought conditions, as mandated by Paragraph 373.709(2)(a)1, Florida Statutes (F.S.).

PUBLIC WATER SUPPLY AND DOMESTIC SELF-SUPPLY

The following sections describe the methodology used to estimate and project PWS and DSS use categories' raw and finished water demands for Martin, St. Lucie, and eastern Okeechobee counties. The approach and assumptions used for this Plan Update are similar to those used for the 2004 UEC Plan Update; some adjustments were made to accommodate

data that are more current. In brief, national, state, utility, and municipal data are all used to quantify and project population numbers.

Projection Methodology

Population projections are the initial and key step in developing demand projections, especially for the PWS and DSS use categories. Population projections are developed using the best available data. The methods of calculating per capita use rates and raw and finished water demand are also described in this *Projection Methodology* section for the PWS and DSS use categories.

2005 Base-Year Estimates

Year 2005 is the base year for updating all of the 2011–2012 SFWMD regional water supply plan-updates. The Bureau of Business and Economic Research (BEBR) 2005 estimates for permanent resident population (BEBR 2006) are used as control populations for each county in the UEC Planning Area. Base-year population estimates for each of the UEC counties are as follows:

- St. Lucie: 240,039 residents
- Martin: 140,983 residents
- Okeechobee: 1,302 residents within UEC Planning Area

The share of the population for eastern Okeechobee County incorporated in the 2011 UEC Plan Update is based on a detailed analysis of 2000 U.S. Census (U.S. Census Bureau 2001) distributions of population within the county. The greater population of Okeechobee County is located in the adjacent Kissimmee Basin Planning Area, and a small portion is located in the St. Johns River Water Management District.

After county control populations were established, information from the SFWMD Water Use Regulatory Database and data from utility operators were used to map areas served by each PWS utility within the UEC Planning Area. Data supplied by the PWS utilities were especially important for identifying areas served. In many instances, there are differences between areas actually served and franchised or legislated service areas. The focus on areas served by PWS utilities improves the accuracy of distributing county base populations into PWS and DSS populations. In **Appendix B**, **Figure B-1** through **Figure B-4** present maps of these service areas.

The populations residing outside of areas served by PWS utilities were included in DSS population estimates because U.S. Census data no longer include the sources of water for households, including those using individual wells. For this Plan Update, it was assumed that all populations outside PWS service areas had self-supplied potable water.

Next, traffic analysis zone (TAZ) data prepared by the local Martin and St. Lucie Metropolitan Planning Organizations (MPOs) served as the basis for distributing 2005 county control populations to the various PWS areas served within these counties. The

entire 2005 population within the eastern portion of Okeechobee County was assigned to the DSS category, as there were no PWS utilities providing potable water service within the UEC Planning Area portion of the county at that time. The population estimates from the TAZ data originated from the 2000 U.S. Census.

To determine which TAZs were within the area served by each PWS utility, the geographic areas represented by TAZs and PWS utility areas served were input as polygon layers into the SFWMD Geographic Information System (GIS) and overlaid. Imagery was used, as needed, to assist in the allocation of TAZs to appropriate PWS areas served. Once TAZs were allocated, the population was totaled for each PWS area served and prorated to reach the county control population of 2005. Populations not within a PWS area served were, by definition, placed within the DSS category. **Table A-1** represents permanent resident population estimates, by PWS utility, for the three UEC counties. Note that seasonal residents, prison inmates, and tourists are not included in permanent-population estimates for purposes of this Plan Update.

Table A-1. Base-year 2005 UEC Planning Area resident population estimates.

Utility	2005 Population
Fort Pierce Utilities Authority (FPUA)	57,313
FPUA Bulk for St. Lucie County	16,689
Harbour Ridge	1,573
Martin County	2,638
Panther Woods	380
Port St. Lucie, City of	125,519
Reserve Community Development District	4,313
Spanish Lakes Utilities	5,650
St. Lucie County North	5,294
St. Lucie West Services District	15,036
St. Lucie County PWS Sub-Total	234,405
St. Lucie Domestic Self-Supply	5,634
St. Lucie County Sub-Total	240,039
Indiantown Company	5,252
Jupiter, Town of	1,731
Martin County Correctional Institution	0
Martin County Utilities	70,995
Piper's Landing	604
Sailfish Point	362
South Martin Regional Utility	19,534
Stuart, City of	16,504
Tequesta, Village of	2,542
Martin County PWS Sub-Total	117,524
Martin Domestic Self-Supply	23,459
Martin County Sub-Total	140,983
Eastern Okeechobee Domestic Self-Supply[a]	1,302
Eastern Okeechobee County Sub-Total	1,302
UEC Planning Area Total	382,324

a. No PWS utilities served the eastern Okeechobee population included in this UEC Plan Update.

2030 County Control Populations

The initial step in the process of preparing population projections was the development of 2030 control populations for each UEC county. Paragraph 373.709(2)(a)1, F.S., prescribes the use of population projections in determining needs in regional water supply plans:

> Population projections used for determining public water supply needs must be based upon the best available data. In determining best available data, the district shall consider the University of Florida's Bureau of Economic and Business Research (BEBR) medium population projections and any population projection data and analysis submitted by a local government pursuant to the public workshop described in subsection (1) if the data and analysis support the local government's comprehensive plan. Any adjustment of or deviation from the BEBR projections must be fully described, and the original BEBR data must be presented along with the adjusted data.

An analysis of various population projection data provided by UEC county governments determined that deviations from BEBR medium projections (BEBR 2009) for the Year 2030 in both St. Lucie and Martin counties are both appropriate and consistent with local water supply planning programs.

St. Lucie County Analysis

The St. Lucie County population data analysis began with a review of the BEBR projections. The Year 2030 medium BEBR projections trended downward during the past two annual projections and the 2030 BEBR high projections decreased in 2008 estimates. In accordance with statutes, a review of population projection data and analyses provided by the local government was conducted. The additional sources of data considered in this analysis include:

- St. Lucie County 10-Year Water Supply Facilities Work Plan (December 2008)
- Fort Pierce Utilities Authority 10-Year Water Supply Facilities Work Plan (December 2007)
- City of Port St. Lucie 10-Year Water Supply Facilities Work Plan (November 2007)
- St. Lucie West Services District 10-Year Water Supply Facilities Work Plan (January 2008)
- Conceptual Master Plan of Water and Wastewater Utility Integration St. Lucie County Phase II (February 2007)
- St. Lucie County Evaluation and Appraisal Report (October 2008)
- City of Fort Pierce Comprehensive Plan (May 2007)

Table A-2 presents an historical record of BEBR medium and high population projections for St. Lucie County.

Table A-2. BEBR historical population projections for St. Lucie County.

Estimate Year[a]	Population Estimate	2025 Projection		2030 Projection	
		Medium	High	Medium	High
2001	198,253	297,400	382,400	316,200	426,100
2002	203,360	296,300	382,800	314,300	426,000
2003	211,898	318,600	405,100	339,900	452,900
2004	226,216	351,600	448,500	377,900	505,400
2005	240,039	389,000	493,700	419,200	559,300
2006	259,300	429,700	527,400	466,400	603,900
2007	271,961	420,600	553,000	460,300	643,100
2008	276,585	395,200	491,700	434,100	567,800

a. BEBR publication dates are one year later than Estimate Years (e.g., Estimate Year 2008 was published by BEBR in 2009).

The local government planning documents provide support for projections that exceed medium BEBR projections. In some cases, the Florida Department of Community Affairs (FDCA) approved projections that would necessitate a county projection higher than medium BEBR. The FDCA is the state agency responsible for ensuring that land development and growth occurs in keeping with statewide growth-management laws. In addition to reviewing these planning documents, District staff discussed future growth with staff from the Treasure Coast Regional Planning Council. The projections in the 2011 UEC Plan Update used BEBR projections, as well as information from local governments and regional entities, as detailed here.

St. Lucie County 10-Year Water Supply Facilities Work Plan (December 2008)

Local governments are required to prepare water supply facilities work plans that identify water supply projects and then adopt revisions to their comprehensive plans within 18 months following the approval of the SFWMD's regional water supply plan updates. St. Lucie County adopted its most recent 10-Year Water Supply Facilities Work Plan (Facilities Work Plan) in February 2009. Population projections for each of St. Lucie County's existing and proposed PWS utility service areas are presented in Table 4-1 of the Facilities Work Plan. According to the Facilities Work Plan, there were approximately 72,000 residents living in the unincorporated area in 2007, only a relatively small portion of which were served by PWS utilities; the balance, by definition, are DSS populations. **Table A-3** summarizes the Facilities Work Plan population projections by PWS utility service area, which represents only expected growth in approved developments. Note that the previously proposed South County PWS utility service area was deleted from the projections. Growth between 2008 and 2018 represents additional population served by county and private PWS utilities during the planning period (29,511 residents). **Table A-3** only includes existing and proposed PWS service area populations; it does not include DSS populations.

Table A-3. 2008 St. Lucie County utilities PWS population projections.

PWS Utility	2008	2013	2018
Holiday Pines (existing county facility)	2,547	2,547	2,547
North County Service Area (proposed)	0	8,750	15,324
Central County Service Area (proposed)	0	0	10,577
Panther Woods	1,040	1,040	1,040
Harbour Ridge	1,573	1,573	1,573
Spanish Lakes	2,470	6,080	6,080
Spanish Lakes Fairways	3,200	3,200	3,200
Total St. Lucie County PWS Utility Population Served	10,830	23,190	40,341

Source: *St. Lucie County 10-Year Water Supply Facilities Work Plan*, December 2008.

Fort Pierce Utilities Authority 10-Year Water Supply Facilities Work Plan (December 2007)

The Fort Pierce Utilities Authority (FPUA) provides potable water to the incorporated city and surrounding areas of unincorporated St. Lucie County, which includes South Hutchinson Island to the Martin County line. **Table A-4** presents population projections for the FPUA PWS service area, from Table 2 of the FPUA 10-Year Water Supply Facilities Work Plan, and shows that population within the FPUA PWS service area is projected to increase by 29,944 residents during the 2007–2017 period.

Table A-4. 2007 Fort Pierce Utilities Authority PWS service area population projections.

Year	Population
2007	82,848
2010	92,161
2015	107,278
2017	112,792

Source: *Fort Pierce Utilities Authority 10-Year Water Supply Facilities Work Plan*, December 2007.

City of Port St. Lucie 10-Year Water Supply Facilities Work Plan (November 2007) and Related Comprehensive Plan Amendments

The City of Port St. Lucie provides potable water to the incorporated section of the city and some adjacent areas of unincorporated St. Lucie County. In addition, the St. Lucie West Services District provides potable water for city customers within its 7-square-mile service area.

As part of the Facilities Work Plan, the City of Port St. Lucie commissioned a population study to review historical trends and develop specific projections. Fishkind & Associates completed the study in 2007 and the FDCA reviewed it. The projections from the Fishkind study were determined using known planned residential developments and average

historic growth rates, and provided the basis for the city's consumptive use permit (CUP) approval by the SFWMD.

Table A-5 provides population projections for the City of Port St. Lucie service area by sub-area from Table 6 of the Port St. Lucie Facilities Work Plan. According to the projection estimates in **Table A-5**, the population within the Port St. Lucie PWS service area will increase by 237,467 residents during the 2005–2030 planning period.

Table A-5. 2007 Port St. Lucie PWS service area population projections by sub-area.

Sub-City Service Area	2005	2010	2015	2020	2025	2030
Old City	124,311	168,417	199,750	228,440	234,176	234,176
Municipal West of I-95	996	2,972	5,637	9,570	13,558	13,558
DRI Area	1,385	6,438	25,544	52,458	85,576	114,642
Northeast Utility Area	11,104	12,353	12,887	12,887	12,887	12,887
Total Service Area[a]	137,796	190,180	243,818	303,355	346,197	375,263

DRI = Development of Regional Impact

a. St. Lucie West and The Reserve area not included.

Source: *City Port St. Lucie 10-Year Water Supply Facilities Work Plan*, November 2007.

Additional municipal population projections, including St. Lucie West and excluding the Northeast Utility Area (unincorporated St. Lucie County), were prepared as part of the comprehensive plan amendments resulting from the Facilities Work Plan (*City of Port St. Lucie Comprehensive Plan*, Municipal Population Forecast Summary, Figure D-5). **Table A-6** presents the supplemental projections.

Table A-6. Port St. Lucie municipal population projections.

Sub-City Service Area	2005	2010	2015	2020	2025	2030
Old City	124,311	168,417	199,750	228,440	234,176	234,176
Municipal West of I-95	996	2,972	5,637	9,570	13,558	13,558
DRI Area	1,385	6,438	25,544	52,458	85,576	114,642
St. Lucie West	15,036	16,755	17,001	17,001	17,001	17,001
Total Service Area	141,728	194,582	247,932	307,469	350,311	379,377

Source: *City of Port St. Lucie Comprehensive Plan*, November 2007, Figure D-5.

The Fishkind Study also prepared population projections for The Reserve, a Development of Regional Impact (DRI) project that is an unincorporated enclave within the City of Port St. Lucie. The Reserve owns and operates its own PWS utility. The community also receives potable water from the St. Lucie West Services District.

Table A-7 presents population projections for The Reserve. The expected population increase within the Reserve PWS service area is 5,202 residents during the 2005–2030 planning period.

Table A-7. 2007 The Reserve PWS population projections.

Year	Population
2005	5,548
2010	8,990
2015	10,750
2020	10,750
2025	10,750
2030	10,750

Source: *Municipal Population Forecast City of Port St. Lucie, Florida* by Fishkind & Associates, Inc., November 2007.

St. Lucie West Services District 10-Year Water Supply Facilities Work Plan (January 2008)

The St. Lucie West Services District provides potable water to the St. Lucie West DRI and a portion of The Reserve DRI through a bulk sales agreement. The Reserve area receiving bulk water service is primarily non-residential development. **Table A-8** includes population projections for the St. Lucie West Services District service area from Table 5 of the St. Lucie West Services District Facilities Work Plan. The projected population increase within the St. Lucie West PWS service area is 3,401 residents during the 2007–2018 planning period.

Table A-8. 2007 St. Lucie West Services District PWS population projections.

Year	Population
2007	17,825
2010	18,676
2015	19,951
2018	21,226

Source: *St. Lucie West Services District Water Supply Facilities Work Plan*, January 2007.

The numbers in **Table A-8** are higher than the Fishkind projections in the Facilities Work Plan for St. Lucie West, which estimates a build-out population of 17,001 residents in 2015 (**Table A-6**), which is fewer than the 2007 estimate of 17,825 residents shown in **Table A-8**. This variance in projections is due to different dwelling unit totals, average dwelling sizes, and occupancy rates.

Conceptual Master Plan of Water and Wastewater Utility Integration St. Lucie County Phase II (February 2007)

St. Lucie County Utilities and Fort Pierce Utilities Authority indicated their desire to investigate the integration of their utility systems in the area north of Midway Road. As a basis for forming regional utility providers, the Conceptual Master Plan (CMP) study proposed six study areas. Development of the CMP also included projected population growth in five-year increments through the year 2025. Information about the location and timing of proposed developments in northern St. Lucie County, including DRIs, was obtained from both city and county. The projections were derived from the 2030 Regional Long Range Transportation Plan (Martin MPO 2008; St. Lucie MPO 2008). Projections were

prepared using TAZ data established in the CMP study. The population projections for this CMP study are divided into Study Areas 1 through 6A. Border descriptions for each CMP study area are as follows:

Study Area	Borders
1	North: Indian River County East: Indian River Lagoon West: Interstate 95 North Hutchinson Island is also included within the study area border.
2	North: Indian River Lagoon East: Interstate 95 South: Florida Turnpike
3	North: County line East: Study Area 2 South: Study Area 4 West: County line
4	North: Study Area 2 and Study Area 3 East: Study Area 5 West: County line
5	North: Florida Turnpike East: Florida Turnpike South: Midway Road West: Midway Road
6	North: Study Area 1 South: Midway Road and East Street West: Florida Turnpike South Hutchinson Island is also within the study area border.
6A	Located south of the Florida Power & Light (FPL) Nuclear Power Plant and extending south to the Martin County line. This study area was separated from Study Area 6 because this area receives its water from Martin County through a long-term bulk water agreement.

The population projections for the CMP study areas are included in **Table A-9**.

Table A-9. 2007 St. Lucie County Utilities and Fort Pierce Utilities Authority combined service areas population projections.

CMP Study Area	2005	2010	2015	2020	2025
1	27,365	37,565	47,764	57,963	68,163
2	7,242	14,484	21,727	40,000	60,000
3	39	45	51	56	62
4	688	906	1,123	1,340	1,558
5	5,389	9,300	13,210	17,120	21,031
6	69,394	77,628	85,863	94,097	102,331
6A	4,900	4,998	5,097	5,196	5,294
Total	115,017	144,926	174,835	215,772	[a]258,439

a. Projections for Study Area 2 included the population of Cloud Grove (approximately 37,000 residents). The population estimates from this area, which is a now-defunct DRI, should be deducted from Study Area 2 if used in population projections for St. Lucie County. Therefore, the 2025 population projection for the combined service areas of St. Lucie County Utilities and the FPUA is 221,439 residents.

Source: *Conceptual Master Plan of Water and Wastewater Utility Integration St. Lucie County Phase II Study* (February 2007), Table 3.2a.

St. Lucie County Evaluation and Appraisal Report (October 2008)

In 2008, population projections for St. Lucie County were updated with amendments to the comprehensive plan related to the Facilities Work Plan using data supplied by the University of Florida BEBR and the Shimberg Center for Affordable Housing. Year 2025 projections for both the unincorporated area and county are in **Table A-10**. Based on the BEBR medium projection, the 2008 projections do not incorporate or consider the planning efforts of the major municipal PWS utilities in St. Lucie County.

Table A-10. 2008 St. Lucie County Evaluation and Appraisal Report population projections.

Year	Unincorporated Area	St. Lucie County[a]
2005	72,764	222,140
2010	81,473	298,800
2015	87,707	346,200
2020	93,398	390,400
2025	98,067	429,700

a. BEBR medium projection; 2007 Source: *St. Lucie County Evaluation and Appraisal Report,* Table 2.1A; October 2008.

City of Fort Pierce Comprehensive Plan (May 2007)

In May 2007, the Future Land Use Element of the City of Fort Pierce's comprehensive plan was updated. As part of the update, population projections were prepared and the City of Fort Pierce's Year 2005 population estimate was 38,569 residents. As **Table A-11** shows, the population within the city expected to increase by 24,460 residents during the 2005–2025 planning period.

Table A-11. 2007 City of Fort Pierce Comprehensive Plan population projections.

Year	Population
2005	38,569
2010	44,051
2015	50,507
2020	62,449
2025	63,029

BEBR Estimate. Source: 2007 Future Land Use Element of the *City of Fort Pierce Comprehensive Plan*, May 2007.

Traffic Analysis Zone (TAZ) Data

The Florida Department of Transportation District 4 used TAZ data for its 2030 population projection for St. Lucie County. The Martin/St. Lucie County MPO initially prepared the data in 2007. The TAZ data was distributed to existing and proposed St. Lucie County PWS service areas as a basis for comparison with the local population projection efforts. The TAZ-based projections are presented in **Table A-12** for the following three county control scenarios:

- Unadjusted TAZ total
- BEBR medium projection
- BEBR high projection

Table A-12. Geographic areas of St. Lucie County for water planning evaluation and alternate 2030 population projections.

Geographic Areas for Evaluations	2030 TAZ[a]	BEBR Medium[b]	BEBR High[b]
North County	120,410	87,368	114,283
South County	800	580	759
East County	6,850	4,970	6,501
Central County	19,470	14,129	18,479
Harbour Ridge	1,830	1,328	1,737
FPUA	106,470	77,261	101,053
Port St. Lucie	318,740	231,283	302,522
St. Lucie West	15,280	11,087	14,503
The Reserve	8,390	6,088	7,963
Total County	598,240	434,094	567,800

a. Distributed to District geographic areas for evaluation by SFWMD staff.
b. Factored to planning areas based upon 2030 TAZ distribution.
Sources: Martin/St. Lucie County MPO 2030 TAZ data; SFWMD.

The final 2030 county control population was determined by adjusting individual populations of the planning areas listed in **Table A-12**, accounting for the adopted local planning initiatives. The TAZ-based distribution presented in **Table A-13** incorporates these results. A summary of the adjustment steps are as follows:

1. The 2030 population for the City of Port St. Lucie is expected to be 375,263 residents (**Table A-5**), consistent with the adopted comprehensive plan and Facilities Work Plan. This figure is included in the city's current consumptive use permit support documentation.
2. To reflect service realities more accurately, the four unincorporated planning areas (North, South, East, and Central) included in **Table A-13** were reconfigured into the following three areas: St. Lucie County North, Fort Pierce Bulk for St. Lucie County, and Unclaimed (DSS area). Further, the projected unincorporated area population was reduced to account for previously anticipated residential growth that is no longer expected. Population reductions resulted from the subtraction of residents from the following DRIs, which were determined to be defunct or inactive by the Treasure Coast Regional Planning council:
    - Cloud Grove: 14,052 residents
    - Visions at Indrio: 9,155 residents
    - Capron Lakes: 9,650 residents
    - Indrio Groves: 8,771 residents
    - Orchard Park: 915 residents
    - Provences: 9,929 residents
3. Minor adjustments to the remaining PWS utilities were then made to reflect local planning initiatives and account for the adjustments made in Steps 1 and 2.

The final 2030 county control number, derived by summing PWS utility and DSS populations, is 595,063 residents (**Table A-13**). This number, although slightly higher than the BEBR high projection of 567,800 residents (**Table A-12**), reflects adopted local planning efforts, TAZ-based projections that include expected major development activity, and future PWS utility service commitments. The establishment of a 2030 county control population exceeding the BEBR medium projection is principally the result of the high number (375,263 residents) approved by the FDCA for the City of Port St. Lucie. The current consumptive use permit also reflects the city's 2030 population projection. Furthermore, agreements with developers for necessary financing and timely improvements support this 2030 population projection.

Table A-13. SFWMD analysis results for St. Lucie County population by PWS utility.[a]

Utility	2005	2010	2015	2020	2025	2030
Fort Pierce Utilities Authority	57,313	65,331	74,138	83,972	94,780	106,794
FPUA Bulk to St. Lucie County	16,689	16,689	16,689	16,689	16,689	16,689
Harbour Ridge	1,573	1,573	1,573	1,573	1,573	1,573
Martin County[a]	2,638	2,638	2,638	2,638	2,638	2,638
Panther Woods	380	465	568	694	849	1,038
Port St. Lucie, City of	125,519	158,678	200,596	253,588	320,579	375,263
The Reserve	4,313	4,833	6,238	6,238	6,238	6,238
Spanish Lakes Utilities	5,650	5,650	5,650	5,650	5,650	5,650
St. Lucie County – North	5,294	8,635	14,085	22,974	37,473	61,153
St. Lucie West Services District	15,036	16,755	17,001	17,001	17,001	17,001
PWS Total	234,405	281,247	339,176	411,017	503,470	594,037
Self-Supply (DSS)	5,634	4,007	2,849	2,026	1,441	1,026
St. Lucie County Total	240,039	285,254	342,025	413,043	504,911	595,063

a. This table represents the St. Lucie County population projections based on the SFWMD-developed methodology.

Martin County Analysis

Table A-14 presents a historical record of BEBR medium and high population projections for Martin County. Both medium and high projections for the years 2025 and 2030 have trended downward since 2007 (date of projection). The lingering effects of economic downturn are likely to result in low levels of population growth for the next few years.

Table A-14. BEBR historical population projections for Martin County.

Estimate Year[a]	Population Estimate	2025 Projections		2030 Projections	
		Medium	High	Medium	High
2001	128,873	187,500	240,700	198,500	266,700
2002	131,051	185,200	238,600	195,500	264,200
2003	134,491	192,000	243,600	203,300	270,100
2004	137,637	190,900	242,500	202,000	268,600
2005	141,059	194,400	245,600	205,100	271,700
2006	142,645	[b]189,700	223,200	199,700	245,100
2007	143,737	178,800	214,300	187,900	235,000
2008	143,868	164,100	190,600	170,400	205,000

a. BEBR publication dates are one year later than Estimate Years (e.g., Estimate Year 2008 was published by BEBR in 2009).
b. The BEBR projection was published in the year 2007.

This SFWMD analysis considered several sources of data, incorporating local planning efforts in the process. The Martin County Comprehensive Plan 2008 Evaluation and Appraisal Report, prepared in July 2008, contains permanent resident population projections, by sub-county planning area (**Table A-15**).

A comparison of the data in **Table A-14** and **Table A-15** indicates that Martin County used the 2007 BEBR medium projection for 2025 of 189,700 residents (the 2006 Estimate Year in **Table A-14**), for its 2008 Evaluation and Appraisal Report. Since preparation of the 2008 report, the BEBR medium projection has declined from 189,700 residents to 170,400 residents for the 20-year planning horizon (**Table A-14**). This change represents a decline of 19,300 residents, or 10.2 percent.

Table A-15. 2008 Martin County Evaluation and Appraisal Report permanent resident population projections.

Planning Area	2005	2010	2015	2020	2025
North River Shores	4,237	4,295	4,342	4,390	4,432
North County	16,703	16,970	17,153	17,338	17,500
Hutchinson Island	2,643	2,678	2,705	2,732	2,756
Stuart Urban	18,661	21,104	23,218	24,332	25,495
Palm City	23,093	24,125	24,918	25,720	26,423
Port Salerno/76 Corridor	29,641	33,746	37,167	40,631	43,663
Mid County	8,440	9,896	11,095	12,309	13,372
South County	28,371	31,133	33,450	35,795	37,849
Indiantown/West County	9,270	10,152	12,952	15,752	18,210
Total Martin County	141,059	154,099	167,000	178,999	189,700

Source: *Martin County 2008 Evaluation and Appraisal Report*, Table 2.2.

Per the 2008 Evaluation and Appraisal Report, Martin County uses weighted average populations in its level-of-service analyses. These weighted average populations assume that five months of the year are peak periods in south Florida, and factor-in peak populations (meaning non-permanent and permanent residents as a seasonal total). **Table A-16** presents weighted population estimates and projections for Martin County by planning area.

Table A-16. 2008 Martin County Evaluation and Appraisal Report weighted average population projections.

Planning Area	2005	2010	2015	2020	2025
North River Shores	4,854	4,646	4,663	4,749	4,795
North County	17,983	18,270	18,333	18,665	18,839
Hutchinson Island	4,210	4,264	4,278	4,349	4,386
Stuart Urban	20,348	23,002	24,615	26,508	27,771
Palm City	23,997	25,068	25,331	26,723	27,452
Port Salerno/SR 76 Corridor	31,451	35,797	36,956	43,086	46,296
Mid County	9,133	10,708	11,122	13,317	14,466
South County	30,665	33,641	34,440	38,664	40,876
Indiantown/West County	10,051	11,007	12,221	17,075	19,739
Total County	152,692	166,403	171,959	193,136	204,620

Source: *Martin County 2008 Evaluation and Appraisal Report*, Table 2.

In addition to its Evaluation and Appraisal Report, Martin County extensively reviewed and amended the Potable Water Element of its comprehensive plan to include the Facilities Work Plan, which addresses the issue of increased potable water demands resulting from population growth.

Table A-17 provides population projections for the various PWS utilities in Martin County. Not included in **Table A-17** are those areas of unincorporated Martin County presently served by the Village of Tequesta and the Town of Jupiter, as well as DSS residents located outside of the county's PWS service areas. According to the SFWMD's *2006 Upper East Coast Water Supply Plan Amendment* (2006 UEC Plan Amendment) (Appendix A, Table A-1), there will be a projected total of 7,605 residents for the year 2025 in Martin County classified as DSS, 2,713 residents served by Tequesta, and 5,207 residents served by Jupiter. Adding these to the 2025 population of 176,783 residents (**Table A-17**) within the Martin County PWS service areas results in a projected total population of 192,308 residents for 2025. With some exceptions, the data presented in **Table A-17** is consistent with projections prepared by the SFWMD in the 2006 UEC Plan Amendment. Two specific differences between the 2006 and 2010 planning estimates may be due to typographical errors:

- Projections included in **Table A-17** of this document indicate the Martin County Consolidated Water System will serve 102,725 residents in 2025, while the 2006 UEC Plan Amendment projects 109,725 residents (Appendix A, Table A-1) will be served.
- **Table A-17** shows the Miles Grant Water Treatment Facility serving 584 residents in 2015 and 2025, but the 2006 UEC Plan Amendment projected 1,080 residents served in 2020, and 1,090 residents served in 2025 (Appendix A, Table A-1).

Table A-17. 2008 Martin County Evaluation and Appraisal Report potable water service area population projections.

PWS Service Area	2005	2015	2025
Indiantown Company	5,466	5,902	10,667
Martin County Consolidated Water System	78,679	92,764	102,725
Miles Grant[a]	1,041	584	584
Piper's Landing	584	584	584
Plantation[a]	684	684	684
Sailfish Point	372	372	372
South Martin Regional Utility	19,534	29,403	37,536
Stuart, City of	16,504	19,782	23,631
Total within PWS Service Area[b]	122,864	150,075	176,783

a. Miles Grant and Plantation were purchased by Martin County Utilities in 2010.
b. Does not include portions of Martin County served by the Town of Jupiter, the Village of Tequesta and Domestic Self-Supply areas.
Source: *Martin County 2008 Evaluation and Appraisal Report*, Table 2.7.

Projections in **Table A-17** include a Year 2025 population estimate for the Indiantown Company service area. This population total, indicating 10,667 residents served by the utility in 2025, reflects a recent Martin County Comprehensive Plan Amendment for the service area. This change was subsequent to publication of the 2006 UEC Plan Amendment.

Based upon the previous discussion, all of Martin County's pertinent adopted planning documents support the use of a 2030 population figure higher than the current BEBR medium projection.

The Martin County and St. Lucie County MPO population projections are also used for preparing the *Martin County 2030 Long-Range Transportation Plan*. The countywide 2030 population projection prepared by the MPO is 195,128 residents, similar to the BEBR medium 2025 population projection of 194,400 residents prepared in 2006 (Estimate Year 2005, **Table A-14**). In the MPO projections, populations are broken out in smaller TAZs. These zones allow for distribution of population into smaller areas, such as utility service areas and cities.

In summary, pertinent Martin County planning documents, including the county's 2008 Evaluation and Appraisal Report, Facilities Work Plan, and updated Potable Water Element project the 2025 population within a range of 190,000 and 194,000 residents, while the MPO projects the 2030 population at approximately 195,000 residents.

Between Estimate Years 2002 and 2007, annual BEBR medium projections for the Martin County 2030 population ranged from a low of about 188,000 to a high of about 205,000 residents (**Table A-14**). The BEBR medium projection for Estimate Year 2008 declined significantly, projecting 170,400 Martin County residents in 2030 (**Table A-14**), which is 10 percent lower than the population projection provided one year earlier.

The TAZ-based 2030 population projection of 195,000 residents is consistent with the adopted Martin County Comprehensive Plan and Facilities Work Plan. The TAZ-based population projection was selected as the Martin County 2030 county control number for the 2011 UEC Plan Update as reflected in **Table A-18**.

Table A-18. SFWMD analysis results for Martin County population by PWS utility.[a]

PWS Utility	2005	2010	2015	2020	2025	2030
Indiantown Company	5,252	5,684	5,902	8,290	10,677	10,677
Jupiter, Town of	1,731	1,814	1,901	1,992	2,087	2,185
Martin Co. Correctional Institution[b]	0	0	0	0	0	0
Martin County Utilities	70,995	77,675	85,003	93,043	101,863	111,491
Piper's Landing	604	604	604	604	604	604
Sailfish Point	362	362	362	362	362	362
South Martin Regional Utility	19,534	22,372	25,622	29,344	33,607	38,478
Stuart, City of	16,504	17,428	18,970	20,648	22,475	23,648
Tequesta, Village of	2,542	2,826	3,141	3,492	3,882	4,311
PWS Total	117,524	128,765	141,505	157,775	175,557	191,756
Self-Supply (DSS)	23,459	21,703	19,085	13,618	7,365	3,382
Martin County Total	140,983	150,468	160,590	171,393	182,922	195,138

a. This table represents the Martin County population projections based on methodology developed by the SFWMD.

b. Inmates are not considered permanent residents or included in weighted average population estimates.

Okeechobee County Analysis

The District's 2006 UEC Plan Amendment cited the 2000 U.S. Census population estimate for its base year Okeechobee County population. To calculate the eastern portion of the Okeechobee County population, located within the SFWMD UEC Planning Area, the District used U.S. Census geographies following a methodology similar to estimating the PWS populations in the 2006 UEC Plan Amendment using TAZ data (**Table A-19**). For the 2011 UEC Plan Update, the percent of the Okeechobee County population within the SFWMD in 2005 is assumed equal to the 2000 population in the 2006 UEC Plan Amendment. This population estimate was applied to the BEBR 2005 population estimate.

The entire 2030 population within Okeechobee County was assigned to the DSS category, as there were no PWS utilities expecting to provide central potable water service within the UEC Planning Area.

Table A-19. SFWMD analysis results for eastern Okeechobee County population[a].

Use Category[b]	2005	2010	2015	2020	2025	2030
Domestic Self-Supply	1,302	1,396	1,469	1,534	1,600	1,662
Eastern Okeechobee County Total	1,302	1,396	1,469	1,534	1,600	1,662

a. This table represents the eastern Okeechobee proportional population projections based on 2009 medium BEBR projections.

b. No PWS utilities served the portion of eastern Okeechobee County in the UEC Planning Area at the time of this Plan Update.

Five-Year Incremental Projections

For the required five-year incremental projections within the 20-year planning horizon of this UEC Plan Update, traffic analysis zone data derived from the 2000 U.S. Census and applied by the Martin and St. Lucie MPO were used as the principal means of distributing 2030 county control populations to the various PWS future service areas within Martin and St. Lucie counties. This methodology is similar to how the 2005 county control population was distributed to the various PWS areas served (see the *2005 Base-Year Estimates* section of this appendix). **Table A-20** shows Year 2030 permanent resident population projections by PWS utility for the three UEC counties using this methodology.

The compound annual growth rate method was selected as the most appropriate means to distribute population growth to the required five-year periods for each PWS utility. This method accounts for an initial short-term continuation of the current economic downturn, and assumes that projected growth during the 2005–2030 planning period will increase at an accelerated rate during the later years. For those PWS utilities that are fully developed, a 0 percent growth rate was assumed. For the complete five-year incremental numbers, see the *Projection Results* section of the *Public Water Supply and Domestic Self-Supply* main heading.

Table A-20. 2030 UEC Planning Area resident population projections by PWS.

PWS Utility	2030 Population
Fort Pierce Utilities Authority (FPUA)	106,794
Fort Pierce Utilities Authority Bulk for St. Lucie County	16,689
Harbour Ridge	1,573
Martin County[a]	2,638
Panther Woods	1,038
Port St. Lucie, City of	375,263
The Reserve Community Development District	6,238
Spanish Lakes Utilities	5,650
St. Lucie County North	61,153
St. Lucie West Services District	17,001
St. Lucie County Self-Supply	1,026
St. Lucie County Total	595,063
Indiantown Company	10,677
Jupiter, Town of	2,185
Martin County Correctional Institution	0
Martin County Utilities	111,491
Piper's Landing	604
Sailfish Point	362
South Martin Regional Utility	38,478
Stuart, City of	23,648
Tequesta, Village of	4,311
Martin County Domestic Self-Supply	3,382
Martin County Total	195,138
Eastern Okeechobee County Domestic Self-Supply	1,662
Eastern Okeechobee County Total	1,662
UEC Planning Area Total	791,863

Per Capita Use Rate (PCUR)

The Per Capita Use Rate (PCUR) expresses the total annual water use divided by the permanent residents. This method includes the finished water used by seasonal residents and tourists, Industrial/Commercial/Institutional PWS utility supplied use, and the losses incurred in water delivery. Irrigation demand for PWS-served households using private well water for irrigation was not assessed due to the lack of available data. The PCURs for DSS within each UEC county were assumed the same as for the countywide PWS utility average.

The objective was to establish finished water PCURs for average conditions in 2005 (the base year) for each PWS utility. These PCURs were calculated by dividing water produced by the PWS utilities by the permanent resident population of the area served. Florida Department of Environmental Protection (FDEP) monthly reports, generated using the methodology described in the previous sections, provided finished water production data and resident population estimates.

Each utility may have specific demographics, seasonality, and distribution characteristics that may be analyzed in detail to better quantify per capita use of specific user categories. A more localized, in-depth analysis of use may be used to focus water conservation efforts and assist in determining water use permit allocations.

Finished and Raw Water Demand Projections

For each PWS utility, raw water adjustment factors were calculated by comparing 2005 U.S. Geological Survey (USGS) data for annual raw water withdrawals to the 2005 FDEP data for finished water production. Then, adjustment factors were applied to finished water projections for average conditions, as a basis to project raw water demand for average conditions for each PWS utility.

Raw-to-finished water adjustment factors for UEC PWS utilities are presented in **Table A-21**. In several instances, rounded pumping data for small PWS utilities revealed no difference between raw water withdrawal and finished water production. In these instances, the raw-to-finished ratio was assumed to be 1.00.

Table A-21. Raw-to-finished water adjustment factors by PWS.

PWS Utility	Raw/Finished Ratio
Fort Pierce Utilities Authority (FPUA)	1.060
FPUA Bulk for St. Lucie County	1.060
Harbour Ridge	1.040
Martin County	1.000
Panther Woods	1.000
Port St. Lucie, City of	1.010
The Reserve Community Dev. District	1.000
Spanish Lakes Utilities	1.080
St. Lucie County North	1.000
St. Lucie West Services District	1.180
St. Lucie Domestic Self-Supply	1.040
Indiantown Company	1.008
Jupiter, Town of	1.000
Martin County Correctional Institution	1.000
Martin County Utilities	1.310
Piper's Landing	1.000
Sailfish Point	1.000
South Martin Regional Utility	1.100
Stuart, City of	1.065
Tequesta, Village of	1.000
Martin Domestic Self-Supply	1.100
Eastern Okeechobee Domestic Self-Supply	1.070

Ratio of raw- to-finished water per USGS withdrawal and FDEP production data (2005).

Finally, 1-in-10 year drought conditions adjustment factors were applied to average conditions for finished and raw water projections to differentiate drought conditions demands from average conditions demands (SFWMD 2006), as follows:

- St. Lucie County: 1.090
- Martin County: 1.085
- Okeechobee County: 1.090

Drought adjustment factors were derived from data presented in Tables V-3-1, V-3-3, and V-3-5 of the *Districtwide Water Supply Assessment* (SFWMD 1998). Factors were derived by dividing data in Column K of each table by data in Column I. The drought factor in Okeechobee County was assumed to be similar to the average in Martin and St. Lucie Counties. **Table A-22** reflects the derived PCUR by PWS entities.

Table A-22. Derived finished per capita use rates (PCUR) by PWS utilities.

PWS Utility	2005 PCUR
Fort Pierce Utilities Authority (FPUA)	116
FPUA Bulk for St. Lucie County	116
Harbour Ridge	80
Martin County Utilities	129
Panther Woods	223
Port St. Lucie, City of	104
Reserve Community Development District	72
Spanish Lakes Utilities	74
St. Lucie County North	69
St. Lucie West Services District	72
St. Lucie Domestic Self-Supply	104
St. Lucie County Total	1,159
Indiantown Company	125
Jupiter, Town of	163
Martin County Correctional Institution	166
Martin County Utilities	129
Piper's Landing	134
Sailfish Point	438
South Martin Regional Utility	175
Stuart, City of	200
Tequesta, Village of	234
Martin County Domestic Self-Supply	151
Martin County Total	1,915
Eastern Okeechobee County Domestic Self-Supply	105
Eastern Okeechobee County Total	105

Projection Results

Table A-23 provides five-year incremental population projections for the UEC counties by PWS utility and DSS populations using the compound annual growth rate method described in the *Five-Year Incremental Projections* section of this appendix.

Table A-24 through **Table A-26** present finished and raw water demand projections for average and 1-in-10 year drought conditions for the three UEC counties by PWS utility and DSS populations. Demand projections were calculated by applying average conditions PCURs, and drought and raw water adjustment factors, as appropriate, to the population projections presented in **Table A-23**. Furthermore, the population projections in **Table A-23** for the Miles Grant PWS and Indian River Plantation PWS were incorporated within the Martin County PWS, as both systems were purchased by Martin County. Regional totals by UEC county are presented in **Table A-27** through **Table A-31**. Eastern Okeechobee has no PWS utilities in the UEC Planning Area.

Table A-23. PWS and DSS population projections for the UEC Planning Area by five-year increments.

Utility	2005	2010	2015	2020	2025	2030
St. Lucie County						
Fort Pierce Utilities Authority	57,313	65,331	74,138	83,972	94,780	106,794
FPUA Bulk for St. Lucie County	16,689	16,689	16,689	16,689	16,689	16,689
Harbour Ridge	1,573	1,573	1,573	1,573	1,573	1,573
Martin County[a]	2,638	2,638	2,638	2,638	2,638	2,638
Panther Woods	380	465	568	694	849	1,038
Port St. Lucie, City of	125,519	158,678	200,596	253,588	320,579	375,263
The Reserve	4,313	4,833	6,238	6,238	6,238	6,238
Spanish Lakes Utilities	5,650	5,650	5,650	5,650	5,650	5,650
St. Lucie County – North	5,294	8,635	14,085	22,974	37,473	61,153
St. Lucie West Services District	15,036	16,755	17,001	17,001	17,001	17,001
PWS Total	234,405	281,247	339,176	411,017	503,470	594,037
Domestic Self-Supply	5,634	4,007	2,849	2,026	1,441	1,026
St. Lucie County Total	240,039	285,254	342,025	413,043	504,911	595,063
Martin County						
Indiantown Company	5,252	5,684	5,902	8,290	10,677	10,677
Jupiter, Town of	1,731	1,814	1,901	1,992	2,087	2,185
Martin County Correctional Institution[b]	0	0	0	0	0	0
Martin County Utilities	70,995	77,675	85,003	93,043	101,863	111,491
Piper's Landing	604	604	604	604	604	604
Sailfish Point	362	362	362	362	362	362
South Martin Regional Utility	19,534	22,372	25,622	29,344	33,607	38,478
Stuart, City of	16,504	17,428	18,970	20,648	22,475	23,648
Tequesta, Village of	2,542	2,826	3,141	3,492	3,882	4,311
PWS Total	117,524	128,765	141,505	157,775	175,557	191,756
Domestic Self-Supply	23,459	21,703	19,085	13,618	7,365	3,382
Martin County Total	140,983	150,468	160,590	171,393	182,922	195,138
Eastern Okeechobee County[c]						
Domestic Self-Supply	1,302	1,396	1,469	1,534	1,600	1,662
Eastern Okeechobee County Total	1,302	1,396	1,469	1,534	1,600	1,662
UEC Planning Area PWS & DSS Total	382,324	437,118	504,084	585,970	689,433	791,863

a. Serves a small portion of South Hutchinson Island and serves Floridian Golf Resort.

b. Inmates are not counted as part of the permanent or seasonal population.

c. No PWS utilities served the portion of Okeechobee County within the UEC Planning Area at the time of this Plan Update.

Table A-24. Finished and raw water demand projections for St. Lucie County (in MGD) by five-year increments.

Finished Water Demand Average Conditions	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Fort Pierce Utilities Authority	6.65	7.58	8.61	9.74	10.99	12.39
FPUA Bulk to St. Lucie County	1.94	1.94	1.94	1.94	1.94	1.94
Harbour Ridge	0.13	0.13	0.13	0.13	0.13	0.13
Martin County	0.34	0.34	0.34	0.34	0.34	0.34
Panther Woods	0.08	0.10	0.13	0.15	0.19	0.23
Port St. Lucie, City of	13.05	16.50	20.86	26.37	33.34	39.03
The Reserve	0.31	0.35	0.45	0.45	0.45	0.45
Spanish Lakes Utilities	0.42	0.42	0.42	0.42	0.42	0.42
St. Lucie County – North	0.37	0.60	1.55	2.53	4.12	6.73
St. Lucie West Services District	1.08	1.21	1.22	1.22	1.22	1.22
PWS Total	24.37	29.17	35.65	43.29	53.14	62.88
Domestic Self-Supply	0.59	0.42	0.30	0.21	0.15	0.11
Finished Water/Average Conditions Total	24.96	29.59	35.95	43.50	53.29	62.99
Finished Water Demand 1-in-10 Year Drought Conditions	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Fort Pierce Utilities Authority	7.21	8.22	9.34	10.57	11.93	13.44
FPUA Bulk to St. Lucie County	2.10	2.10	2.10	2.10	2.10	2.10
Harbour Ridge	0.14	0.14	0.14	0.14	0.14	0.14
Martin County	0.37	0.37	0.37	0.37	0.37	0.37
Panther Woods	0.09	0.11	0.14	0.17	0.21	0.25
Port St. Lucie, City of	14.16	17.91	22.64	28.61	36.17	42.34
The Reserve	0.34	0.38	0.49	0.49	0.49	0.49
Spanish Lakes Utilities	0.45	0.45	0.45	0.45	0.45	0.45
St. Lucie County – North	0.40	0.65	1.68	2.74	4.47	7.30
St. Lucie West Services District	1.17	1.31	1.33	1.33	1.33	1.33
PWS Total	26.43	31.64	38.68	46.97	57.66	68.21
Domestic Self-Supply	0.64	0.45	0.32	0.23	0.16	0.12
Finished Water/Drought Conditions Total	27.07	32.09	39.00	47.20	57.82	68.33

Raw Water Demand Average Conditions	2005	2010	2015	2020	2025	2030
Fort Pierce Utilities Authority	7.05	8.04	9.13	10.33	11.66	13.14
FPUA Bulk to St. Lucie County	2.05	2.05	2.05	2.05	2.05	2.05
Harbour Ridge	0.13	0.13	0.13	0.13	0.13	0.13
Martin County	0.34	0.34	0.34	0.34	0.34	0.34
Panther Woods	0.08	0.10	0.13	0.15	0.19	0.23
Port St. Lucie, City of	13.18	16.66	21.06	26.63	33.66	39.40
The Reserve	0.31	0.35	0.45	0.45	0.45	0.45
Spanish Lakes Utilities	0.45	0.45	0.45	0.45	0.45	0.45
St. Lucie County – North	0.37	0.60	1.55	2.53	4.12	6.73
St. Lucie West Services District	1.28	1.42	1.45	1.45	1.45	1.45
PWS Total	25.24	30.14	36.74	44.51	54.50	64.37
Domestic Self-Supply	0.61	0.43	0.31	0.22	0.16	0.11
Raw Water/Average Conditions Total	25.85	30.57	37.05	44.73	54.66	64.48
Raw Water Demand 1-in-10 Year Drought Conditions	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Fort Pierce Utilities Authority	7.65	8.72	9.90	11.21	12.65	14.25
FPUA Bulk to St. Lucie County	2.23	2.23	2.23	2.23	2.23	2.23
Harbour Ridge	0.14	0.14	0.14	0.14	0.14	0.14
Martin County	0.37	0.37	0.37	0.37	0.37	0.37
Panther Woods	0.09	0.11	0.14	0.17	0.21	0.25
Port St. Lucie, City of	14.30	18.08	22.85	28.89	36.52	42.75
The Reserve	0.34	0.38	0.49	0.49	0.49	0.49
Spanish Lakes Utilities	0.49	0.49	0.49	0.49	0.49	0.49
St. Lucie County – North	0.40	0.65	1.68	2.74	4.47	7.30
St. Lucie West Services District	1.39	1.55	1.57	1.57	1.57	1.57
PWS Total	27.40	32.72	39.86	48.30	59.14	69.84
Domestic Self-Supply	0.66	0.47	0.34	0.24	0.17	0.12
Raw Water/Drought Conditions Total	28.06	33.19	40.20	48.54	59.31	69.96

Table A-25. Finished and raw water demand projections for Martin County (MGD) by five-year increments.

Finished Water Demand Average Conditions	2005	2010	2015	2020	2025	2030
Indiantown	0.66	0.71	0.74	1.04	1.33	1.33
Jupiter, Town of	0.28	0.30	0.31	0.32	0.34	0.36
Martin Correctional Institution	0.15	0.15	0.30	0.30	0.30	0.30
Martin County Utilities	9.16	10.02	10.97	12.00	13.14	14.38
Piper's Landing	0.08	0.08	0.08	0.08	0.08	0.08
Sailfish Point	0.16	0.16	0.16	0.16	0.16	0.16
Stuart, City of	3.30	3.49	3.79	4.13	4.50	4.73
South Martin Regional Utility	3.42	3.92	4.48	5.14	5.88	6.73
Tequesta, Village of	0.59	0.66	0.73	0.82	0.91	1.01
PWS Total	17.80	19.49	21.56	23.99	26.64	29.08
Domestic Self-Supply	3.54	3.27	2.85	1.99	0.98	0.38
Finished Water/Average Conditions Total	21.34	22.76	24.41	25.98	27.62	29.46
Finished Water Demand 1-in-10 Year Drought Conditions	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Indiantown	0.72	0.77	0.80	1.13	1.45	1.45
Jupiter, Town of	0.31	0.32	0.34	0.35	0.37	0.39
Martin Correctional Institution	0.16	0.16	0.31	0.31	0.31	0.31
Martin County Utilities	9.98	10.92	11.95	13.08	14.32	15.68
Piper's Landing	0.09	0.09	0.09	0.09	0.09	0.09
Sailfish Point	0.17	0.17	0.17	0.17	0.17	0.17
South Martin Regional Utility	3.73	4.27	4.89	5.60	6.41	7.34
Stuart, City of	3.60	3.79	4.11	4.48	4.88	5.13
Tequesta, Village of	0.65	0.72	0.80	0.89	0.99	1.10
PWS Total	19.41	21.21	23.46	26.10	28.99	31.66
Domestic Self-Supply	3.86	3.58	3.13	2.18	1.09	0.44
Finished Water/Drought Conditions Total	23.27	24.79	26.59	28.28	30.08	32.10

Raw Water Demand Average Conditions	2005	2010	2015	2020	2025	2030
Indiantown	0.66	0.72	0.74	1.04	1.35	1.35
Jupiter, Town of	0.28	0.30	0.31	0.32	0.34	0.36
Martin Correctional Institution	0.15	0.15	0.30	0.30	0.30	0.30
Martin County Utilities	10.37	11.34	12.41	13.58	14.87	16.28
Piper's Landing	0.08	0.08	0.08	0.08	0.08	0.08
Sailfish Point	0.20	0.20	0.20	0.20	0.20	0.20
South Martin Regional Utility	3.77	4.43	4.95	5.66	6.49	7.43
Stuart, City of	3.51	3.72	4.04	4.40	4.79	5.04
Tequesta, Village of	0.59	0.66	0.73	0.82	0.91	1.01
PWS Total	19.61	21.60	23.76	26.40	29.33	32.05
Domestic Self-Supply	3.89	3.59	3.13	2.18	1.11	0.43
Raw Water/Average Conditions Total	23.50	25.19	26.89	28.58	30.44	32.48
Raw Water Demand 1-in-10 Year Drought Conditions	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Indiantown	0.72	0.78	0.81	1.14	1.47	1.47
Jupiter, Town of	0.31	0.32	0.34	0.35	0.37	0.39
Martin Correctional Institution	0.18	0.18	0.33	0.33	0.33	0.33
Martin County Utilities	11.30	12.36	13.53	14.81	16.21	17.74
Piper's Landing	0.09	0.09	0.09	0.09	0.09	0.09
Sailfish Point	0.22	0.22	0.22	0.22	0.22	0.22
South Martin Regional Utility	4.11	4.71	5.39	6.17	7.07	8.09
Stuart, City of	3.60	4.03	4.38	4.77	5.20	5.47
Tequesta, Village of	0.65	0.72	0.80	0.89	0.99	1.10
PWS Total	21.18	23.41	25.89	28.77	31.95	34.90
Domestic Self-Supply	4.24	3.69	3.18	2.14	0.94	0.20
Raw Water/Drought Conditions Total	25.42	27.10	29.07	30.91	32.89	35.10

Table A-26. Finished and raw water demand projections for eastern Okeechobee County.

Finished Water Demand Average Conditions	2005	2010	2015	2020	2025	2030
Domestic Self-Supply	0.14	0.15	0.15	0.16	0.17	0.17
Total	0.14	0.15	0.15	0.16	0.17	0.17
Finished Water Demand 1-in-10 Year Drought Conditions	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Domestic Self-Supply	0.15	0.16	0.17	0.18	0.18	0.19
Total	0.15	0.16	0.17	0.18	0.18	0.19
Raw Water Demand Average Conditions	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Domestic Self-Supply	0.14	0.15	0.15	0.16	0.17	0.17
Total	0.14	0.15	0.15	0.16	0.17	0.17
Raw Water Demand 1-in-10 Year Drought Conditions	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Domestic Self-Supply	0.15	0.16	0.17	0.18	0.18	0.19
Total	0.15	0.16	0.17	0.18	0.18	0.19

Table A-27. UEC Planning Area PWS and DSS population.

County	2005	2010	2015	2020	2025	2030
St. Lucie PWS only	234,405	281,247	339,176	411,017	503,470	594,037
Martin PWS only	117,524	128,765	141,505	157,775	175,557	191,756
Eastern Okeechobee	0	0	0	0	0	0
UEC PWS Total	351,929	410,012	480,681	568,792	679,027	785,793
UEC DSS Total	30,395	27,106	23,403	17,178	10,406	6,070
UEC PWS & DSS Total	382,324	437,118	504,084	585,970	689,433	791,863

Table A-28. UEC Planning Area finished water demand (MGD) average conditions.

County	2005	2010	2015	2020	2025	2030
St. Lucie PWS only	24.37	29.17	35.65	43.29	53.14	62.88
Martin PWS only	17.80	19.49	21.56	23.99	26.64	29.08
Eastern Okeechobee	0.00	0.00	0.00	0.00	0.00	0.00
UEC PWS Total	42.17	48.66	57.21	67.28	79.78	91.96
UEC DSS Total	4.27	3.84	3.30	2.36	1.30	0.66
UEC PWS & DSS Total	46.44	52.50	60.51	69.64	81.08	92.62

Table A-29. UEC Planning Area finished water demand (MGD) 1-in-10 year drought conditions.

County	2005	2010	2015	2020	2025	2030
St. Lucie PWS only	26.43	31.64	38.68	46.97	57.66	68.21
Martin PWS only	19.41	21.21	23.46	26.10	28.99	31.66
Eastern Okeechobee	0.00	0.00	0.00	0.00	0.00	0.00
UEC PWS Total	45.84	52.85	62.14	73.07	86.65	99.87
UEC DSS Total	4.65	4.19	3.62	2.59	1.43	0.75
UEC PWS & DSS Total	50.49	57.04	65.76	75.66	88.08	100.62

Table A-30. UEC Planning Area raw water demand (MGD) average conditions.

County	2005	2010	2015	2020	2025	2030
St. Lucie PWS only	25.24	30.14	36.74	44.51	54.50	64.37
Martin PWS only	19.61	21.60	23.76	26.40	29.33	32.05
Eastern Okeechobee	0.00	0.00	0.00	0.00	0.00	0.00
UEC PWS Total	44.85	51.74	60.50	70.91	83.83	96.42
UEC DSS Total	4.64	4.17	3.59	2.56	1.44	0.71
UEC PWS & DSS Total	49.49	55.91	64.09	73.47	85.27	97.13

Table A-31. UEC Planning Area raw water demand (MGD) 1-in-10 year drought conditions.

County	2005	2010	2015	2020	2025	2030
St. Lucie PWS only	27.40	32.72	39.86	48.30	59.14	69.84
Martin PWS only	21.18	23.41	25.89	28.77	31.95	34.90
Eastern Okeechobee	0.00	0.00	0.00	0.00	0.00	0.00
UEC PWS Total	48.58	56.13	65.75	77.07	91.09	104.74
UEC DSS Total	5.05	4.32	3.69	2.56	1.29	0.51
UEC PWS & DSS Total	53.63	60.45	69.44	79.63	92.38	105.25

INDUSTRIAL / COMMERCIAL / INSTITUTIONAL SELF-SUPPLY

This category includes Industrial, Commercial, and Institutional demands not supported by a public utility. Water used for industrial, commercial, and institutional purposes supplied by utilities is included with other utility demands.

Projection Methodology

In the UEC Planning Area, the water use projection for Industrial/Commercial/Institutional Self-Supply (ICI) assumes that growth in self-supply for this region is proportional to the growth in population in the area. This use category comprises large facilities for production processing, such as citrus, concrete, manufacturing, and biotechnology.

Permitted water use in this category was used to determine the current ICI demands. The amount of the use was assumed to continue until the permit expiration date for each ICI permit in the SFWMD Water Use Regulatory Database. After that time, the growth in this sector is projected to increase at the rate of population growth.

Current and future demand calculations include information from the SFWMD Water Use Regulatory Database along with population growth rates for each county. All population numbers are based on the projections for each individual county shown earlier in this appendix. Industrial/Commercial/Institutional projections assume demands between average and 1-in-10 year drought conditions remain the same, and that withdrawal demands are equal to user demands so that no distinction is made between finished and raw water amounts.

Projection Results

Table A-32 summarizes the ICI demand estimates and projections in the UEC Planning Area in five-year increments during the 20-year planning horizon.

Table A-32. Industrial/Commercial/Institutional Self-Supply demand projections (MGD).

County	2005	2010	2015	2020	2025	2030
St. Lucie	2.6	2.6	2.8	3.3	3.9	4.6
Martin	4.1	4.1	4.2	4.4	4.5	4.8
Eastern Okeechobee	0.0	0.0	0.0	0.0	0.0	0.0
UEC Planning Area Total	6.7	6.7	7.0	7.7	8.4	9.4

RECREATIONAL / LANDSCAPE SELF-SUPPLY

The Recreational/Landscape Self-Supply category includes self-supplied irrigation demands for large landscaped and recreational areas, and for golf courses. Landscape irrigation includes water demands for all parks (small to large), communities, and homeowner associations with large common areas, and areas with large green space, such as ball fields, stadiums, and cemeteries. These Recreational/Landscape Self-Supply uses are identified through consumptive use permits. With the exception of individual private home landscape irrigation provided by permitted homeowner associations, private home landscape irrigation is not included in this water use category.

A substantial portion of Recreational/Landscape Self-Supply water demands will be met by the reuse of reclaimed water throughout the planning period. Not only will this reduce withdrawal demands on the water resources, it may provide additional recharge of the surficial aquifer system.

Projection Methodology

Landscape and golf course acres were identified using the SFWMD Water Use Regulatory Database, and by the review of individual, major, and minor general permits. This data was then verified and adjusted to reflect changes. Future years were projected using county population growth rates, information provided by local planning officials, and golf course publications. Golf course demands, by county, are projected separately and added to the other landscape and recreation demands. A slower growth rate was assumed for golf courses than the population growth rate, based on industry and local planning estimates of new courses during the 20-year planning horizon. Non-golf course landscaping and recreational water use was assumed to increase at the same rate as the county population, with 2010 used as the base year estimate for the projections, and the 2005 projection from the previous plan update included for comparison. No landscape or golf course permits were identified for eastern Okeechobee County.

Recreational gross and net irrigation demand calculations for this 2011 UEC Plan Update applied results from the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS Model), which uses data from the 1965–2000 time frame. These model results were also used in the 2004 UEC Plan Update and are used to calculate agricultural irrigation demands. The AFSIRS Model calculates both gross and net irrigation requirements.

Net irrigation demand, also referred to as net irrigation requirement, is the amount of water the plant needs in addition to anticipated rainfall. It is the amount of water (expressed in inches per year) that should be delivered to the plant's root zone. The gross irrigation demand, or gross irrigation requirement, is the amount of water that must be withdrawn from the source in order to be delivered to the plant's root zone. It includes both the net irrigation requirement and the losses incurred in the process of delivering irrigation to the plant's root zone. Irrigation efficiency as a modeled factor refers to the average percent of

total water applied that is delivered to the plant's root zone. This relationship is expressed as follows:

Gross Irrigation Requirement = Net Irrigation Requirement / Irrigation Efficiency

The demands are calculated using 36 years of rainfall and potential evapotranspiration (ETp) climatic data from appropriate meteorological stations. The analyses also consider soil types, irrigation methods, and strategies. The irrigation system assumed for recreation is sprinkler irrigation with 75 percent efficiency, and rainfall and ETp data for the respective region. The model uses assumed crop coefficients of sod to represent turf and landscape plants, and calculates demands for average and 1-in-10 year drought conditions for each county.

Landscape

Demand projections for this section include irrigated acreage permitted for landscaping and recreation, excluding golf courses. Landscape acreage was projected to increase at the same rate as the county population, with 2010 used as the base year estimate, and the 2005 projection from the previous UEC water supply plan update included for comparison. Consequently, projected growth in this water use category was dependent on projected increases in landscape acres. Acreage projections for large-scale Landscape Self-Supply acreage are outlined in **Table A-33** as follows:

Table A-33. Landscape Self-Supply acreage.

County	2005	2010	2015	2020	2025	2030
St. Lucie Acres	1,901	6,797	7,952	9,303	10,978	12,625
St. Lucie Population	240,039	285,254	342,025	413,043	504,911	595,063
Martin Acres	2,745	5,598	5,878	6,222	6,540	6,735
Martin Population	140,983	150,468	160,590	171,393	182,922	195,128
Total Acres	4,646	12,395	13,830	15,525	17,518	19,360

Golf Courses

Golf course acreages were estimated for 2010 using the SFWMD Water Use Regulatory Database and information from golf course publications, such as the golf course directory published by the National Golf Foundation, communication with local planning officials and golf course personnel, and GIS land use information. Based on current information, golf course acres were assumed to increase at half the rate as estimated in the 2006 UEC Plan Update, and are expected to grow very slowly during the current 20-year planning horizon. Acreage projections were made for total irrigated golf course acreage, and those currently supplied by a reuse or potable utility system subtracted from the total irrigated acreage projection to derive the self-supplied golf course demands.

St. Lucie County

Table A-34 lists golf courses in St. Lucie County. As in other counties, the growth in golf course acreage has occurred irregularly on a year-by-year basis. St. Lucie County estimates one new golf course will be added during the 20-year planning horizon. The average size of a golf course in St. Lucie County is 117 acres. **Table A-35** shows historical and projected acreage for golf courses and **Table A-36** reflects the irrigation requirements for projected self-supply golf courses in the county.

Table A-34. Golf courses in St. Lucie County.

Name	City	Irrigated Acres	Self-Supplied Acres	Number of Holes	Reclaimed Use	FAS	Surface Water/ SAS
Ballantrae Golf & Yacht Club[a]	Port St. Lucie	120	0	18	Yes		
Club Med Sandpiper	Port St. Lucie	187	187	9			Yes
Fairwinds Golf Course	Fort Pierce	144	144	18			Yes
Gator Trace Golf & Country Club	Fort Pierce	65	65	18			Yes
Harbour Ridge Yacht & Country Club (Golden Marsh)[b]	Palm City	267	267	36	Yes		Yes
Indian Hills Golf Course	Fort Pierce	130	130	18			Yes
Island Dunes Country Club[b]	Jensen Beach	50	50	9	Yes	Yes	Yes
Island Pines	Fort Pierce	50	50	18			Yes
Legacy Golf & Tennis Club	Port St. Lucie	146	146	18			Yes
Panther Woods Country Club	Fort Pierce	149	149	18			Yes
PGA in the Village (three golf courses: Ryder, Wanamaker, and Dye Reserve)	Port St. Lucie	435	435	54			Yes
PGA St. Lucie West Country Club[b]	Port St. Lucie	100	0	18	Yes		
Saint's Golf Course[b]	Port St. Lucie	80	80	18	Yes		Yes
Savanna Club	Port St. Lucie	60	60	18			Yes
Spanish Lakes I	Port St. Lucie	8	8	9			
Spanish Lakes Country Club Village/Spanish Lakes Golf Club	Fort Pierce	11	11	9			Yes
St. James Golf Course	Port St. Lucie	108	108	18			Yes
The Tesoro Club[b]	Port St. Lucie	325	325	36	Yes		Yes
Total		**2,435**	**2,215**				

FAS = Floridan aquifer system; SAS = surficial aquifer system.

a. Irrigated acreage is totally on reuse.

b. Irrigated acreage is partially on reuse.

Note: Some golf courses on 100 percent reuse have a consumptive use permit (CUP) permit for emergency back-up supply using surface water/surficial aquifer system. Irrigated acreage relies on reuse water.

Table A-35. Historical and projected irrigated golf course acreage in St. Lucie County.

Year	Historical or Projected Total Acreage	Projected Self-Supplied Acreage
1965	276	
1970	326	
1975	334	
1980	339	
1985	984	
1990	1,476	
1995	1,786	
2000	2,343	
2005	2,389	1,976
2010	2,435	2,215
2015	2,435	2,215
2020	2,557	2,326
2025	2,557	2,326
2030	2,685	2,442

Table A-36. Irrigation requirements for projected self-supplied golf courses in St. Lucie County.

		2005	2010	2015	2020	2025	2030
Irrigated Acreage		2,389	2,435	2,435	2,557	2,557	2,685
Self-Supplied Irrigated Acreage		1,976	2,215	2,215	2,326	2,326	2,442
Water to Sustain Crop (Net Irrigation Requirements) Average (inches per month)		**2005 (million gallons)**	**2010 (million gallons)**	**2015 (million gallons)**	**2020 (million gallons)**	**2025 (million gallons)**	**2030 (million gallons)**
January	1.0	52	58	58	61	61	64
February	1.4	77	86	86	90	90	95
March	2.2	120	135	135	142	142	149
April	3.2	173	194	194	204	204	214
May	2.8	153	171	171	180	180	189
June	1.8	96	108	108	114	114	119
July	2.0	108	122	122	128	128	134
August	1.4	77	86	86	90	90	95
September	0.7	40	45	45	47	47	50
October	0.7	36	40	40	42	42	44
November	0.8	44	50	50	52	52	55
December	0.7	40	45	45	47	47	50
Total	18.7	1,018	1,141	1,141	1,198	1,198	1,258
Water to Sustain Crop (Net Irrigation Requirements) 1-in-10 Year Drought Conditions (inches per month)		**2005 (million gallons)**	**2010 (million gallons)**	**2015 (million gallons)**	**2020 (million gallons)**	**2025 (million gallons)**	**2030 (million gallons)**
January	1.4	92	103	103	109	109	114
February	1.8	109	122	122	128	128	134
March	2.4	141	158	158	166	166	174
April	3.5	205	230	230	242	242	254
May	3.5	181	203	203	213	213	224
June	2.3	105	118	118	123	123	130
July	2.7	100	113	113	118	118	124
August	1.9	105	118	118	123	123	130
September	1.1	57	63	63	67	67	70
October	1.0	52	58	58	61	61	64
November	1.1	57	63	63	67	67	70
December	1.0	60	68	68	71	71	75
Total	23.7	1,263	1,416	1,416	1,487	1,487	1,561

Note: Irrigation requirements based on generic sandy soil, Fort Pierce climate station, and irrigation efficiency of 75 percent.

While landscape increased at the same rate as population, golf courses increased at a slower rate. **Table A-37** shows the St. Lucie County share of each type of Recreational/Landscape Self-Supply water demand during the time frame of this 2011 UEC Plan Update. The 2005 projection from the previous plan is included for comparison.

Table A-37. Recreational/Landscape Self-Supply acres by type and percent of acreage totals.

	St. Lucie Golf Course Acreage Projections	Landscape Acres	Percentage of Golf Course Acres
2005	1,976	1,901	50
2010	2,215	6,797	25
2015	2,215	7,952	22
2020	2,326	9,303	20
2025	2,326	10,978	17
2030	2,442	12,625	16

Martin County

Golf courses currently existing in Martin County are shown in **Table A-38**. As in St. Lucie County, the growth in golf course acreage has occurred irregularly on a year-by-year basis. **Table A-39** shows historical and projected golf course acreage. **Table A-40** reflects the irrigation requirements for projected self-supply golf courses in Martin County.

Table A-38. Golf courses in Martin County.

Name	City	Irrigated Acres	Self-Supplied Acres	Number of Holes	Reclaimed Use	FAS	Surface Water/ SAS
Champions Club at Summerfield	Stuart	155	155	18			Yes
Cypress Links Golf Club	Jupiter	150	150	18			Yes
Eagle Marsh Golf Club[a]	Jensen Beach	120	0	18	Yes		
Eaglewood Golf & Tennis[a]	Hobe Sound	50	0	18	Yes		
Evergreen Club	Palm City	105	105	18			Yes
Florida Club at Martin County[a]	Stuart	130	0	18	Yes		Yes
Floridian Golf Resort[b,c]	Palm City	120	120		Yes		Yes
76 Golf World	Stuart	12	12	9			Yes
Hammock Creek Golf Club	Palm City	192	192	18			Yes
Heritage Ridge Golf Club[a]	Hobe Sound	110	0	18	Yes		
Hobe Sound Golf Club[b]	Hobe Sound	110	110	18	Yes		Yes
Indian Wood Golf & Country Club	Indiantown	85	85	18		Yes	Yes

Name	City	Irrigated Acres	Self-Supplied Acres	Number of Holes	Reclaimed Use	FAS	Surface Water/ SAS
Jonathan's Landing at Old Trail	Jupiter	225	225	18			Yes
Jupiter Hills Club[a]	Tequesta	200	0	18	Yes		Yes
Jupiter Island Club	Hobe Sound	103	103	18		Yes	Yes
Loblolly Pines Golf Club[a]	Hobe Sound	98	0	18	Yes		Yes
Lost Lake Golf Club[a]	Hobe Sound	136	0	18	Yes		
Mariner Sands Country Club[a]	Stuart	215	0	18	Yes		Yes
Marriott Golf Resort on Hutchinson Island	Palm City	70	70	18		Yes	Yes
Martin County Golf & Country Club	Stuart	182	182	36		Yes	Yes
Martin Downs Country Club (Towers and Crane Creek)[a]	Palm City	259	0	36	Yes		Yes
McArthur Golf Club[b]	Hobe Sound	93	93	18	Yes		Yes
Medalist Golf Club[b]	Hobe Sound	104	104	18	Yes		Yes
Miles Grant Country Club	Stuart	69	69	18	Yes	Yes	Yes
Monarch Country Club	Palm City	148	148	18			Yes
Monterey Yacht & Country Club	Stuart	37	37	9			Yes
Palm Cove Golf Club	Palm City	81	81	18			Yes
Pine Lakes Golf Club	Stuart	50	50	18			Yes
Piper's Landing Country Club[b]	Palm City	80	80	18	Yes		Yes
Riverbend Golf Club[a]	Tequesta	105	0	18	Yes		Yes
Sailfish Point Golf Club[b]	Stuart	112	112	18	Yes	Yes	
Sand Turtle LLC	Jupiter Island	12	12	4		Yes	Yes
Turtle Creek Club[a]	Tequesta	105	0	18	Yes		Yes
Willoughby Golf Club[b]	Stuart	200	200	18	Yes		Yes
Yacht & Country Club of Stuart	Stuart	140	140	18			Yes
Total		**4,163**	**2,635**				

FAS = Floridan aquifer system; SAS = surficial aquifer system.

a. Irrigated acreage is totally on reuse.

b. Irrigated acreage is partially on reuse.

c. Course located in Martin and St. Lucie Counties. The pumping facilities, lake, and one of the wells are in Martin County.

Note: Some golf courses on 100 percent reuse have a CUP permit for emergency back-up supply using surface water/surficial aquifer system.

Projected golf course acreage is based on the historical acres from the 2005 historical base and golf course projections from local industry experts and planners. The 2010 data is corroborated by calls to golf course professionals, and references to golf course guides and the SFWMD Water Use Regulatory Database.

Golf course acreage projections increased by half a percent (0.5%) in the 2005 historical base, and slower growth is assumed by holding the acres constant over two periods.

Table A-39. Historical and projected irrigated golf course acreage in Martin County.

Year	Historical or Projected Total Acreage	Projected Self-Supplied Acreage
1970	751	
1975	1,329	
1980	1,794	
1985	2,485	
1990	3,322	
1995	3,623	
2000	4,104	
2005	4,134	2,896
2010	4,163	2,635
2015	4,163	2,635
2020	4,371	2,767
2025	4,371	2,767
2030	4,590	2,905

Note: Martin County planning staff has indicated no current plans for additional golf courses.

Table A-40. Irrigation requirements for projected self-supplied golf courses in Martin County.

		2005	2010	2015	2020	2025	2030
Irrigated Acreage		4,134	4,163	4,163	4,371	4,371	4,590
Self-Supplied Irrigated Acreage		2,896	2,635	2,635	2,767	2,767	2,905
Water to Sustain Turf (Net Irrigation Requirements) Average (inches per month)		**2005 (million gallons)**	**2010 (million gallons)**	**2015 (million gallons)**	**2020 (million gallons)**	**2025 (million gallons)**	**2030 (million gallons)**
January	1.1	88	80	80	84	84	89
February	1.6	124	113	113	119	119	125
March	2.2	171	156	156	164	164	172
April	2.9	230	209	209	220	220	231
May	2.5	194	177	177	186	186	195
June	1.3	106	96	96	101	101	106
July	1.4	112	102	102	107	107	113
August	1.3	106	96	96	101	101	106
September	0.7	59	54	54	56	56	59
October	0.7	53	49	49	51	51	54
November	0.7	59	54	54	56	56	59
December	0.8	64	59	59	62	62	65
Total	17.4	1,368	1,244	1,244	1,307	1,307	1,372
Water to Sustain Turf (Net Irrigation Requirements) 1-in-10 Year Drought Conditions (inches per month)		**2005 (million gallons)**	**2010 (million gallons)**	**2015 (million gallons)**	**2020 (million gallons)**	**2025 (million gallons)**	**2030 (million gallons)**
January	1.7	135	123	123	129	129	136
February	2.0	159	145	145	152	152	160
March	2.6	206	188	188	197	197	207
April	3.8	301	274	274	288	288	302
May	3.4	265	241	241	253	253	266
June	2.0	154	140	140	147	147	154
July	1.9	147	134	134	141	141	148
August	2.0	154	140	140	147	147	154
September	1.1	83	75	75	79	79	83
October	1.0	76	70	70	73	73	77
November	1.1	83	75	75	79	79	83
December	1.1	88	80	80	84	84	89
Total	23.5	1,852	1,685	1,685	1,769	1,769	1,857

While landscape acres increased at the same rate as population, golf course acres increased at a slower rate in Martin County. **Table A-41** shows the share of each type of Recreational/Landscape Self-Supply water demand during the time frame of this 2011 UEC Plan Update. The 2005 projection from the previous plan is included for comparison.

Table A-41. Recreational acres by type and percent of acreage totals.

Year	Martin County Golf Course Acreage Projections	Landscape Acres	Percentage of Golf Course Acres
2005	2,896	2,745	51
2010	2,635	5,598	32
2015	2,635	5,978	31
2020	2,767	6,222	31
2025	2,767	6,540	30
2030	2,905	6,735	30

Projection Results

Recreational/Landscape Self-Supply acreage projections and gross irrigation demands are shown in **Table A-42**. These acres include landscape and golf course acreage previously discussed, estimated acreage of other large landscaped areas, and gross irrigation demands for both average conditions and for 1-in-10 year drought conditions. The projected net irrigation (user) demands are shown in **Table A-43** for both average conditions and for 1-in-10 year drought conditions.

Table A-42. Recreational/Landscape Self-Supply acreage and gross (raw) irrigation demands for St. Lucie and Martin counties, including landscape and golf course demands.

County/Acreage/Demand	2005	2010	2015	2020	2025	2030
St. Lucie County						
Acreage	**Acres**					
Irrigated Acreage	3,877	9,012	10,167	11,630	13,305	15,067
Gross Irrigation Demands	**MGD**					
Annual Based on Average Rainfall Year (18.96 in.)	7.29	16.95	19.13	21.88	25.03	28.34
Annual Based on 1-in-10 Year Drought Conditions (23.71 in.)	9.12	21.19	23.91	27.35	31.29	35.43
Martin County						
Acreage	**Acres**					
Irrigated Acreage	5,641	8,233	8,513	8,989	9,307	9,640
Gross Irrigation Demands	**MGD**					
Annual Based on Average Rainfall Year (17.39 in.)	9.73	14.20	14.69	15.51	16.06	16.63
Annual Based on 1-in-10 Year Drought Conditions (23.54 in.)	13.18	19.23	20.12	21.00	21.74	22.52

Table A-43. Recreational/Landscape gross average conditions water demands summary (MGD).

Gross Demands by County	2005	2010	2015	2020	2025	2030
St. Lucie County	7.29	16.95	19.13	21.88	25.03	28.34
Martin County	9.73	14.20	14.69	15.51	16.06	16.63
Eastern Okeechobee	0.00	0.00	0.00	0.00	0.00	0.00
UEC Average Conditions Total	**17.02**	**31.15**	**33.82**	**37.39**	**41.09**	**44.97**

Table A-44. Recreational/Landscape gross 1-in-10 year drought conditions water demands summary (MGD).

Gross Demands by County	2005	2010	2015	2020	2025	2030
St. Lucie County	9.12	21.19	23.91	27.35	31.29	35.43
Martin County	13.18	19.23	20.12	21.00	21.74	22.52
Eastern Okeechobee County	0.00	0.00	0.00	0.00	0.00	0.00
UEC Drought Conditions Total	**22.30**	**40.42**	**44.03**	**48.35**	**53.03**	**57.95**

Table A-45. Recreational/Landscape acreage and net irrigation demands for St. Lucie and Martin counties, including landscape and golf course demands.

County/Acreage/Demand	2005	2010	2015	2020	2025	2030
St. Lucie County						
Acreage	**Acres**					
Irrigated Acreage	3,877	9,012	10,167	11,630	13,305	15,067
Net Irrigation Requirement	**MGD**					
Annual Based on Average Rainfall Year (18.96 in.)	5.47	12.71	14.34	16.41	18.77	21.26
Annual Based on 1-in-10 Year Drought Conditions (23.71 in.)	6.84	15.89	17.93	20.51	23.46	26.57
Martin County						
Acreage	**Acres**					
Irrigated Acreage	5,641	8,233	8,513	8,989	9,307	9,640
Net Irrigation Requirement	**MGD**					
Annual Based on Average Rainfall Year (17.39 in.)	7.30	10.65	11.01	11.63	12.04	12.47
Annual Based on 1-in-10 Year Drought Conditions (23.54 in.)	9.88	14.42	15.09	15.75	16.30	16.89

Table A-46. Recreational/Landscape net average conditions water demands summary (MGD).

Net Demands by County	2005	2010	2015	2020	2025	2030
St. Lucie County	5.47	12.71	14.34	16.41	18.77	21.26
Martin County	7.3	10.65	11.01	11.63	12.04	12.47
Eastern Okeechobee County	0.00	0.00	0.00	0.00	0.00	0.00
UEC Average Conditions Total	12.77	23.36	25.35	28.04	30.81	33.73

Table A-47. Recreational/Landscape net 1-in-10 year drought conditions water demands summary (MGD).

Net Demands by County	2005	2010	2015	2020	2025	2030
St. Lucie County	6.84	15.89	17.93	20.51	23.46	26.57
Martin County	9.88	14.42	15.09	15.75	16.3	16.89
Eastern Okeechobee County	0.00	0.00	0.00	0.00	0.00	0.00
UEC Drought Conditions Total	16.72	30.31	33.02	36.26	39.76	43.46

POWER GENERATION SELF-SUPPLY

The primary use of water at thermoelectric power plants is for cooling purposes. Additional water uses at power plants include boiler make-up water and ancillary uses, such as domestic-type use by employees.

Florida Power & Light (FPL) is a major electrical power supplier, serving three regions within south Florida. In 2010, two power generation facilities in the UEC Planning Area were permitted to withdraw water: the FPL Martin Power Plant and the Treasure Coast Energy Center (TCEC) located in Fort Pierce.

The FPL Martin site uses fresh water for cooling purposes and the TCEC uses water from the Floridan aquifer. Both power plants anticipate using reclaimed water for part of their needs at some point in the future. Neither facility used reclaimed water in 2005.

The St. Lucie Nuclear Plant uses ocean water, which is not addressed in water supply plans. The Indiantown Cogeneration Plant withdraws water from Taylor Creek/Nubbin Slough in the Kissimmee Basin Planning Area and is therefore not included in this Plan Update.

Projection Methodology

Water demand projections were made in conjunction with FPL to reflect expectations for power demand growth; strategies for obtaining the electricity to meet those demands (which leads to estimation of power plant construction); types and locations of power plants; types of cooling facilities; and, ability to achieve efficiencies in water use. Most of these factors are subject to considerable uncertainty. The efficacy of meeting demands from freshwater and saltwater sources needs further consideration, as does the cost-effectiveness of design and operational strategies that could significantly reduce water use. Power generation water demands are based on current usage and are assumed to remain the same between average and 1-in-10 year drought conditions demands. Because no distinction is needed between raw and finished water in this use category, withdrawal demands are considered the same as user demands.

Projection Results

The estimates presented in **Table A-48** include the water demands for a potential increase in power generating capacity in this region. Some thermoelectric power generation may occur elsewhere within the FPL grid and not at the Martin plant.

The two existing power generation plant demands reflect the use of fresh water and brackish water and account for the total Power Generation Self-Supply category use in the UEC Planning Area for years 2005–2015. The efficacy and availability of water sources will be a consideration for future plant site selection. The primary sources of water for the proposed power plants will be fresh water, captured excess storm water, brackish Floridan aquifer water, and reclaimed water. Of those sources, fresh water and Floridan aquifer

water are considered in the 2011 UEC Plan Update. (Saltwater withdrawals at the St. Lucie Nuclear plant are not included because the source does not require a permit.)

Table A-48. Projected Power Generation Self-Supply demands (MGD).

Facility	Gross (Raw) Demands for Average Conditions					
	2005	2010	2015	2020	2025	2030
FPL Martin (existing)	17.4	17.4	18.4	19.4	20.4	21.4
FPL Proposed	0	0	0	12.1	12.1	27.1
TCEC (existing since 2008)	0	2.8	2.8	2.8	2.8	2.8
UEC Total	17.4	20.2	21.2	34.3	35.3	51.3

AGRICULTURAL SELF-SUPPLY

In 2010, agriculture is (and is expected to remain) the dominant land use in the region. Since publication of the 2004 UEC Plan Update, the region has been affected by the economic issues facing the entire state, hurricanes, and citrus crop diseases. In spite of the challenges, the acres dedicated to agriculture are expected to grow. Due to the complexity of developing agricultural projections, ranges of acres and water demand were used to represent the agricultural projections for this 2011 UEC Plan Update.

Agricultural water use includes water for irrigated commercially grown crop categories and includes: 1) citrus; 2) other fruits and nuts; 3) vegetables, melons, and berries; 4) field crops-sugarcane; 5) sod; 6) greenhouse/nursery; 7) pasture; and 8) miscellaneous.

Projection Methodology

The District completed the development of agricultural demands for the UEC Planning Area in coordination with staff from government agencies and agricultural stakeholders. The projections developed were directly dependent on estimates of existing and proposed irrigated acres. The methods chosen to project crop acreages were those judged by the SFWMD, in cooperation with the agricultural industry and other agencies, to reflect the specific crop condition in each county in the UEC Planning Area most accurately. This led to some deviation in projection methods used between crop categories. Each method was considered suitable for the crop type it represented. Crop acreage projections were needed for St. Lucie and Martin counties, as well as the eastern portion of Okeechobee County. For eastern Okeechobee County, crop acreages were frequently projected for the entire county and these projections apportioned. Where appropriate, this was accomplished by assuming changes in acreage proportional to the most recently reported acreage ratios. Acreage ratios were developed with the use of District land use maps.

At present, crop projections are generally challenging to estimate due to economic conditions, citrus diseases, and international competition. While the current conditions indicate little growth in the near future, improvements in the economic climate,

development of citrus rootstock, and changes in the international market each have the potential to boost agricultural production in the UEC Planning Area. Agricultural projections are based on best available data and input from industry stakeholders at the time of calculation.

The agricultural demand assessment used acreage estimates developed from the following sources:

- The U.S. Department of Agriculture – National Agriculture Statistics Service (USDA-NASS) 2007 Census of Agriculture and yearly Commercial Citrus Inventories (USDA data was used or considered when available)
- The SFWMD Water Use Regulatory Database
- Local agricultural extension offices
- University of Florida/Institute of Food and Agricultural Services (UF/IFAS)
- Florida Department of Agriculture and Consumer Services (FDACS)
- Florida Farm Bureau and other SFWMD agricultural stakeholders
- The SFWMD acreage estimates developed as part of GIS agricultural land use/crop type analysis (1999 and 2004)

When data from these sources were insufficient for indicating trends and no empirical knowledge of future changes in a crop's acreage was available, the acreage for that crop category was projected to remain at its most recently reported level; for some crops, a range of acreage projections was used because little to no data was available, or in the case of citrus, future acreage is dependent on the results of ongoing research. A hierarchy of data preference was used for developing agricultural water use projections, starting with the USDA reported data. However, USDA data were not consistently available for each crop, in each county, for every year. Agricultural Self-Supply demand calculations for this 2011 UEC Plan Update applied results from the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS Model), which uses data from the 1965–2000 time frame. These model results were also used in the 2004 UEC Plan Update. The 2000 UEC Plan used the modified Blaney-Criddle Model to estimate supplemental requirements for irrigation.

The AFSIRS Model calculates the net irrigation requirements for each crop category and irrigation system. As described in the *Recreational/Landscape Self-Supply* section of this appendix, the net irrigation requirement reflects an estimate of the amount of water (expressed in inches per year) that should be delivered to a plant's root zone. The gross irrigation requirement is the amount of water that must be withdrawn from the source in order to be delivered to the plant's root zone. It includes both the net irrigation requirement and the losses incurred irrigating the plant's root zone. Irrigation efficiency as a modeled factor refers to the average percent of total water applied that is delivered to the plant's root zone. This relationship is expressed as follows:

Gross Irrigation Requirement = Net Irrigation Requirement / Irrigation Efficiency

The AFSIRS Model calculates the average and 1-in-10 year drought conditions irrigation requirements. Historical weather data from appropriately located rainfall stations that most accurately represent the average and 1-in-10 year drought conditions for each crop/county combination are used to calculate the irrigation requirements.

Projections of gross irrigation demands are based on an assumed or estimated irrigation system type. The effect of the corresponding irrigation efficiency (shown in parentheses) is based on the interpretation of current ratios and trends. There are three basic types of irrigation systems currently used in south Florida crop production: seepage/flood irrigation, sprinkler, and low-volume/microirrigation systems. A weighted irrigation efficiency is calculated for each crop type category based on percent use of the three different irrigation systems, as reported in the SFWMD Water Use Regulatory Database.

Available water capacity and depth of soil have a direct effect on effective rainfall infiltration, which is considered in the AFSIRS model. Another factor the AFSIRS Model considers explicitly is on-farm irrigation management strategies, which is combined with soil properties for this analysis. The default AFSIRS Model soil database includes a generic sandy soil. While the soils vary across the region, sandy soil parameters are used as a simplifying and conservative assumption, and are considered reasonable for planning purposes. The assumption is conservative because it results in higher estimated irrigation requirements in comparison with other soil types, which generally can hold more water.

Agricultural alternative water supply projects are likely to target changes in the sources and efficiencies of water delivery to meet the crop net irrigation demands. For instance, tailwater recovery could capture some of the water not effectively delivered to the root zone, and by recapturing and reusing this water, withdrawals from the water resource could ultimately be reduced.

Example Water Demand Calculations

A detailed example of water demand calculation procedures is presented in this section.

First, the acreage of each crop in each county within the UEC Planning Area was determined. Next, the area-weighted irrigation efficiency for the crop type in a particular county was calculated from irrigation system information contained in the SFWMD Water Use Regulatory Database. **Table A-49** lists the estimated irrigation efficiency for each of the three categories of irrigation system.

Table A-49. Estimated irrigation efficiency for each type of irrigation system.

Irrigation Category	Irrigation Efficiency
Low-volume micro-irrigation	0.85
Seepage crown flood	0.50
Sprinkler	0.75

Water use permit data categorized as citrus in Martin County show that 23 percent of permittees use low-volume irrigation systems, 67 percent use sprinkler systems, and 9 percent use seepage systems. Using the permit data, the area-weighted irrigation efficiency is:

IRR_EFF = (0.23 x 0.85) + (0.67 x 0.75) + (0.09 x 0.50) / (0.23 + 0.67 + 0.09) = 75 percent

Of the water withdrawn (gross demand) for citrus irrigation in Martin County, 75 percent is available to the crop. Losses occur due to evaporation and line system leakage.

However, information given by a contact at the Indian River Citrus League indicated that 90 percent use low-volume irrigation systems and 10 percent use seepage systems. The area-weighted irrigation efficiency based on this data is:

IRR_EFF = (0.9 x 0.85) + (0.1 x 0.5) = 81.5 percent

Based on this data, 81.5 percent of the water withdrawn (gross demand) from a surface or ground water source is available to the crop.

AFSIRS runs were completed for the 2004 UEC Plan Update. The AFSIRS output is given as the net irrigation requirement in inches per year (inches/year), the amount of water the crop needs in addition to rainfall. The input to the model is daily rainfall and evapotranspiration (ET) rates in inches. The model results for the 2004 UEC Plan Update used input data for the period from 1965–2000. Based on the rainfall and ET data and calculated irrigation requirements, the AFSIRS outputs include both requirements for the average irrigation and the 1-in-10 year drought conditions irrigation. Fifty percent of the calculated yearly irrigation requirement rates are lower than the average irrigation requirement. Ninety percent of the calculated yearly irrigation requirements are lower than the average 1-in-10 year drought conditions irrigation requirement.

Continuing with the Martin County citrus crop example, the average and 1-in-10 year drought conditions net irrigation requirements calculated by AFSIRS are 10.82 inches/year and 16.01 inches/year, respectively. Water use permits show that there were about 46,040 acres of irrigated citrus in Martin County in 2005. The USDA commercial citrus inventory data estimated the acreage closer to 37,340 acres (USDA 2005). The AFSIRS average irrigation requirement and 40,000 acres are used to estimate the gross irrigation demand for an average year for citrus in Martin County as follows:

Gross Irrigation Requirement (MGD) = Net Irrigation Requirement (MGD)/Irrigation Efficiency

$$\textbf{Gross Irrigation Requirement (MGD)} = \frac{10.82\ {}^{in}/_{yr} \times 40{,}000\ acres \times \left[{}^{1\ yr}/_{365\ days}\right] \times \left[{}^{1ft}/_{12\ in}\right] \times \left[{}^{43{,}560 ft^2}/_{acre}\right] \times \left[{}^{7.4805\ gal}/_{ft^3}\right]}{0.815} \times 10^{-6} \approx 40 \text{ MGD}$$

Back-calculation of Net Demand Example

The irrigation requirements tables in the following *Projection Results* section provide the gross irrigation requirement (or gross irrigation demand), and the crop irrigation efficiency in each county. To calculate net irrigation demand, use the Water to Sustain the Crop (net irrigation requirement) data (average rainfall year and 1-in-10 year drought conditions), which can be found in the left column of the irrigation requirements tables. This information can be used to calculate the net irrigation demand as follows:

Net Irrigation Requirement (MGD) = Gross Irrigation Requirement (MGD) x Irrigation Efficiency

For example, based on the gross demand in 2005 for an average rainfall year in St. Lucie County.

Net Irrigation Requirement (MGD) = 69 MGD x 81.5 percent ≈ 56.2 MGD

Projection Results

Citrus

Citrus remains the main irrigated crop grown in the UEC Planning Area and all categories of citrus (e.g., oranges, grapefruit, tangerines) are included in this category for projection purposes. In the 2004 UEC Plan Update, historical citrus acreage data were gathered from the Florida Agricultural Statistics Service (FASS) *Commercial Citrus Inventory* (FASS 2002). The USDA–NASS, in cooperation with the FDACS, publishes a Commercial Citrus Inventory every year. The data from the USDA-NASS is focused on citrus production and not on young groves not yet in production, inactive or abandoned groves.

Citrus production has declined since publication of the 2004 UEC Plan Update. Since 1994, the UEC Planning Area has continually lost citrus acres. This decline is for a variety of reasons, including citrus canker, citrus greening, hurricanes, international competition, and transition of agricultural land into urban developments and ecosystem restoration projects. However, citrus-producing acres are expected to increase once new rootstock becomes available and as growers begin using some of the new production techniques. Water use permits for citrus groves are still in effect and most are valid for 20-year durations. See the Chapter 2 of the *2011 UEC Plan Update – Planning Document*.

Some lost citrus acreage in Martin County will not return to production; specifically, the land that the SFWMD purchased for the C-44 Reservoir/Stormwater Treatment Area Project, a component of the Comprehensive Everglades Restoration Plan (CERP) Indian River Lagoon – South Project. The projections in **Table A-50** are based on the assumption that citrus acres will reach a minimum in 2015 and then begin to increase.

Throughout the UEC Planning Area, the citrus irrigation efficiency was calculated as an average 81.5 percent based on the estimated usage of low-volume and seepage irrigation systems. **Table A-50** summarizes the projected water demand for citrus in the UEC Planning Area.

Table A-50. Gross irrigation requirements for projected citrus acreage in the UEC Planning Area.

County/Acreage/Demand	2005	2010	2015	2020	2025	2030
St. Lucie County						
Citrus Acreage	**Acres**					
Irrigated Acreage	64,427	45,800	43,510	47,861–50,037	48,579–55,041	49,308–60,545
Water to Sustain Crop (Net Irrigation Requirement)	**Gross Demand (MGD) Gross accounts for system losses and inefficiencies: total volume needed for withdrawal**					
Annual Based on Average Rainfall Year (11.75 in.)	69	49	47	51–53	52–59	53–65
Annual Based on 1-in-10 Year Drought Conditions (14.87 in.)	87	62	59	65–68	66–75	67–82
Martin County						
Citrus Acreage	**Acres**					
Irrigated Acreage	40,330	19,999	18,999	20,899–21,849	21,213–24,034	21,531–26,437
Water to Sustain Crop (Net Irrigation Requirement)	**Gross Demand (MGD) Gross accounts for system losses and inefficiencies: total volume needed for withdrawal**					
Annual Based on Average Rainfall Year (10.82 in.)	40	20	19	21–22	21–24	21–26
Annual Based on 1-in-10 Year Drought Conditions (16.01 in.)	59	29	28	31–32	31–35	31–39
Eastern Okeechobee County						
Citrus Acreage	**Acres**					
Irrigated Acreage	5,743	3,830	3,639	4,002–4,185	4,062–4,603	4,123–5,064
Water to Sustain Crop (Net Irrigation Requirement)	**Gross Demand (MGD) Gross accounts for system losses and inefficiencies: total volume needed for withdrawal**					
Annual Based on Average Rainfall Year (13.97 in.)	7	5	5	5	5	5–6
Annual Based on 1-in-10 Year Drought Conditions (26.72 in.)	14	9	9	10	10–11	10–12
Upper East Coast Total						
Citrus Acreage	**Acres**					
Total Irrigated Acreage	110,500	69,629	66,148	72,762–76,071	73,854–83,678	74,962–92,046
Water to Sustain Crop (Net Irrigation Requirement)	**Gross Demand (MGD) Gross accounts for system losses and inefficiencies: total volume needed for withdrawal**					
Total Average-Year Gross Demand	116	74	70	77–80	78–88	79–95
Total 1-in-10 Year Drought Conditions Gross Demand	160	100	96	106–110	107–121	108–133

Other Fruits and Nuts

Within the SFWMD, non-citrus fruit crops (e.g. avocados, mangos, papayas) are produced commercially, but the production of these crops in the UEC Planning Area is estimated to be fewer than 120 acres. Fruits and nuts represent approximately .07 percent of the crops in this region and the water demand for this category is 0.2 MGD. The effect of even a 100 percent difference between the estimated and actual acreage for this crop category would change the overall agricultural water demand by less than 0.0015 percent; the effect on overall water demands for the region would be even smaller. Because the production of these crops is expected to remain small, water demand projections for this crop category are not included in a separate table; however, the acreage is accounted for in the total agricultural acreage (see **Table A-56**).

Vegetables, Melons, and Berries

The main crops in this category include tomatoes, peppers, eggplant, squash, melons, and tropical vegetables. Because the USDA's agricultural census (USDA 2007) did not include any information for the acreage of vegetable crop production in Martin and St. Lucie counties, the SFWMD's water use permits were used to estimate the acreage of these crops in 2005 and 2010. For the purposes of this 2011 UEC Plan Update all vegetable, melon, and berry crop acreage in Okeechobee County was assumed to be in the part of Okeechobee County that does not fall within the UEC Planning Area. Vegetable acreage projections were requested from agricultural stakeholders and agencies, including UF/IFAS, FDACS, and the Florida Farm Bureau. Gathered information indicated that vegetable acreage could be negatively impacted due to potential volatility and by competition from imports.

Flood irrigation is the primary irrigation type used for small vegetables. Based on the estimated usage of each type of irrigation system shown in water use permits, the irrigation efficiency was assumed to be 50 percent for these kind of crops.

Table A-51 summarizes the projected water demand for the vegetables, melons, and berries crop category acreage in the UEC Planning Area.

Table A-51. Gross irrigation requirements for projected vegetables, melons, and berries crop acreage in the UEC Planning Area.

County/Acreage/Demand	2005	2010	2015	2020	2025	2030
St. Lucie County						
Vegetables Acreage	**Acres**					
Irrigated Acreage	3,816	3,625	3,434	3,244	3,053	2,862
Water to Sustain Crop (Net Irrigation Requirement)	**Gross Demand (MGD)** Gross accounts for system losses and inefficiencies: total volume needed for withdrawal					
Annual Based on Average Rainfall Year (8.41 in.)	5	5	4	4	4	4
Annual Based on 1-in-10 Year Drought Conditions (11.61 in.)	7	6	6	6	5	5
County/Acreage/Demand	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Martin County						
Vegetables Acreage	**Acres**					
Irrigated Acreage	4,436	4,214	3,992	3,771	3,549	3,327
Water to Sustain Crop (Net Irrigation Requirement)	**Gross Demand (MGD)** Gross accounts for system losses and inefficiencies: total volume needed for withdrawal					
Annual Based on Average Rainfall Year (7.95 in.)	5	5	5	4	4	4
Annual Based on 1-in-10 Year Drought Conditions (11.63 in.)	8	7	7	7	6	6
Upper East Coast Total						
Vegetables Acreage	**Acres**					
Total Irrigated Acreage	8,252	7,839	7,427	7,015	6,602	6,189
Water to Sustain Crop (Net Irrigation Requirement)	**Gross Demand (MGD)** Gross accounts for system losses and inefficiencies: total volume needed for withdrawal					
Total Average-Year Gross Demand	10	10	9	9	8	8
Total 1-in-10 Year Drought Conditions Gross Demand	14	14	13	12	11	11

Field Crops – Sugarcane

Sugarcane remains a significant field crop within the UEC region. Other field crops include rice, seed corn, soybeans, and sorghum. In the UEC Planning Area, sugarcane is grown only in Martin County. In the 2004 UEC Plan Update, historical sugarcane acreage data were gathered from annual volumes of the FASS *Field Crops Summary*. For this 2011 UEC Plan Update, the data for 2005 and 2010 were obtained from the SFWMD Water Use Regulatory Database and the permitted acreage dedicated to sugarcane was assumed to remain constant until 2030.

Sugarcane is initially propagated by planting stalk cuttings and four harvests can be obtained from a planting. The first harvest takes place approximately 13 months after planting and then three ratoons (shoots from the root of the plant after it has been cropped) provide the harvest during the next three years. Sugar production per unit of land surface declines gradually with each harvest. In approximately four years, the increased yields associated with replanting outweigh the costs of obtaining the crop from ratoons. Because land may lie fallow for several months between crop rotation cycles, approximately 20 percent of the land associated with sugarcane production will not be harvested in any given year. Additionally, about 1 in 10 acres of sugarcane is grown for seed production.

Flood irrigation is the predominate irrigation system for sugarcane, therefore, the irrigation efficiency for this crop was reported as 50 percent. **Table A-52** summarizes the projected water demand for sugarcane crop acreage in the UEC Planning Area.

Table A-52. Gross irrigation requirements for projected sugarcane acreage in the UEC Planning Area.

County/Acreage/Demand	2005	2010	2015	2020	2025	2030
Martin County						
Sugarcane Acreage	**Acres**					
Irrigated Acreage	10,379	10,379	10,379	10,379	10,379	10,379
Water to Sustain Crop (Net Irrigation Requirement)	**Gross Demand (MGD)** Gross accounts for system losses and inefficiencies: total volume needed for withdrawal					
Annual Based on Average Rainfall Year (10.43 in.)	16	16	16	16	16	16
Annual Based on 1-in-10 Year Drought Conditions (15.83 in.)	24	24	24	24	24	24

Sod Production

Just as with food crops, the sod sold for landscape purposes is irrigated while it is growing. In the 2004 UEC Plan Update, the acreage of sod production was provided by the local UF/IFAS extension agent. For this 2011 UEC Plan Update, 2005 and 2010 sod acreages were estimated based on data contained in the SFWMD Water Use Regulatory Database. Because the population in the UEC Planning Area is expected to grow, there is a potential for increased sod demand. Therefore, ranges for sod production acres and water demand were used. Sod irrigation is provided by several methods, including low-volume, sprinkler, and flood irrigation. Based on the irrigation systems indicated in the water use permits, the average irrigation efficiency for sod was calculated to be 77 percent in Martin County, 53 percent in St. Lucie County, and 50 percent in Okeechobee County.

Information about sod acreage projections was requested from agricultural stakeholders and agencies, including UF/IFAS, FDACS, and the Florida Farm Bureau. Input received provided little data regarding specific acres for sod. Because of this and the potential for future population growth, an acreage range was used that kept the high projections for 2010 acreage.

Table A-53 summarizes the projected water demand for the sod crop category in the UEC Planning Area.

Table A-53. Gross irrigation requirements for projected sod acreage.

County/Acreage/Demand	2005	2010	2015	2020	2025	2030
St. Lucie County						
Sod Acreage	**Acres**					
Irrigated Acreage	1,271	1,208	1,144–1,208	1,080–1,208	1,017–1,208	953–1,208
Water to Sustain Crop (Net Irrigtion Requirement)	**Gross Demand (MGD) Gross accounts for system losses and inefficiencies: total volume needed for withdrawal**					
Annual Based on Average Rainfall Year (18.99 in.)	3	3	3	3	3	3
Annual Based on 1-in-10 Year Drought Conditions (23.57 in.)	4	4	4	4	3	3
Martin County						
Sod Acreage	**Acres**					
Irrigated Acreage	1,976	1,877	1,779–1,877	1,680–1,877	1,581–1,877	1,482–1,877
Water to Sustain Crop (Net Irrigtion Requirement)	**Gross Demand (MGD) Gross accounts for system losses and inefficiencies: total volume needed for withdrawal**					
Annual Based on Average Rainfall Year (17.31 in.)	3	3	3	3	3	2–3
Annual Based on 1-in-10 Year Drought Conditions (23.57 in.)	4	4	4	4	4	3–4
Eastern Okeechobee County						
Sod Acreage	**Acres**					
Irrigated Acreage	2,238	2,126	2,014–2,126	1,902–2,126	1,790–2,126	1,679–2,126
Water to Sustain Crop (Net Irrigtion Requirement)	**Gross Demand (MGD) Gross accounts for system losses and inefficiencies: total volume needed for withdrawal**					
Annual Based on Average Rainfall Year (20.44 in.)	7	6	6	6	5–6	5–6
Annual Based on 1-in-10 Year Drought Conditions (26.33 in.)	9	8	8	7–8	7–8	7–8
Upper East Coast Total						
Sod Acreage	**Acres**					
Total Irrigated Acreage	5,485	5,211	4,937–5,211	4,662–5,211	4,388–5,211	4,114–5,211
Water to Sustain Crop (Net Irrigtion Requirement)	**Gross Demand (MGD) Gross accounts for system losses and inefficiencies: total volume needed for withdrawal**					
Total Average-Year Gross Demand	13	13	12–13	11–13	11–13	10–13
Total 1-in-10 Year Drought Conditions Gross Demand	17	16	16	15–16	14–16	13–16

Greenhouse / Nursery

Crops grown in greenhouses may include vegetables, herbs, fruits, and berries, garden plants for sale, cut flowers, and caladium bulbs. The same crops may be grown in the open in a nursery setting where the plants are the product for sale. There are 40 acres in Martin County devoted to cut flowers. In the 2004 UEC Plan Update, historical irrigated greenhouse/nursery acreage data were gathered from the FDACS, *Division of Plant Industry's Annual Reports*, and from UF/IFAS extension offices. For this 2011 UEC Plan Update, information from the SFWMD Water Use Regulatory Database and the USDA (2007) was used to estimate 2005 and 2010 greenhouse/nursery acreage. Based on the data received, the 2010 acreage was assumed to remain in production through the 20-year planning horizon.

Greenhouse/nursery irrigation is generally provided by low-volume methods. Based on the information obtained in the SFWMD Water Use Regulatory Database, the average irrigation efficiency for this crop category was calculated to be 85 percent in St. Lucie and Okeechobee counties and 83 percent in Martin County.

Table A-54 summarizes the projected water demand for the greenhouse/nursery crop category.

Table A-54. Gross irrigation requirements for projected greenhouse/nursery acreage.

County/Acreage/Demand	2005	2010	2015	2020	2025	2030
St. Lucie County						
Greenhouse/Nursery Acreage	**Acres**					
Irrigated Acreage	799	759	759	759	759	759
Water to Sustain Crop (Net Irrigation Requirement)	**Gross Demand (MGD) Gross accounts for system losses and inefficiencies: total volume needed for withdrawal**					
Annual Based on Average Rainfall Year (21.92 in.)	1.5	1.5	1.5	1.5	1.5	1.5
Annual Based on 1-in-10 Year Drought Conditions (26.82 in.)	1.9	1.8	1.8	1.8	1.8	1.8
Martin County						
Greenhouse/Nursery Acreage	**Acres**					
Irrigated Acreage	1,183	1,124	1,124	1,124	1,124	1,124
Water to Sustain Crop (Net Irrigation Requirement)	**Gross Demand (MGD) Gross accounts for system losses and inefficiencies: total volume needed for withdrawal**					
Annual Based on Average Rainfall Year (20.6 in.)	2.2	2.1	2.1	2.1	2.1	2.1
Annual Based on 1-in-10 Year Drought Conditions (26.71 in.)	2.8	2.7	2.7	2.7	2.7	2.7
Eastern Okeechobee County						
Greenhouse/Nursery Acreage	**Acres**					
Irrigated Acreage	63	60	60	60	60	60
Water to Sustain Crop (Net Irrigation Requirement)	**Gross Demand (MGD) Gross accounts for system losses and inefficiencies: total volume needed for withdrawal**					
Annual Based on Average Rainfall Year (21.92 in.)	0.1	0.1	0.1	0.1	0.1	0.1
Annual Based on 1-in-10 Year Drought Conditions (26.82 in.)	0.1	0.1	0.1	0.1	0.1	0.1
Upper East Coast Total						
Greenhouse/Nursery Acreage	**Acres**					
Total Irrigated Acreage	2,045	1,943	1,943	1,943	1,943	1,943
Water to Sustain Crop (Net Irrigation Requirement)	**Gross Demand (MGD) Gross accounts for system losses and inefficiencies: total volume needed for withdrawal**					
Total Average -Year Gross Demand	3.8	3.6	3.6	3.6	3.6	3.6
Total 1-in-10 Year Drought Conditions Gross Demand	4.9	4.6	4.6	4.6	4.6	4.6

Improved Pasture

The SFWMD definition of improved pasture is any pasture with existing or proposed facilities to deliver supplemental irrigation. Information from agricultural stakeholders indicates irrigation of improved pasture usually occurs during dry periods to keep grass alive for the nourishment of cattle, because the economic returns associated with cattle production generally do not justify the expense of year-round pasture irrigation.

The 2004 UEC Plan Update stated that the UEC contained about 19,000 acres of improved pasture. The District completed the agricultural basin renewal process in the UEC Planning Area after the 2004 UEC Plan Update. Current information from the SFWMD Water Use Regulatory Database indicates that the 2010 pasture acreage is about 43,000 acres. This acreage includes the permitting of existing improved pasture acreage, as well as the proposed conversion of lands to improved pasture. Projections of improved pasture acreage were based on input from agricultural stakeholders and agencies, including UF/IFAS and the Florida Farm Bureau, etc. It was suggested that a small increase could be likely during the 20-year planning horizon. The improved pasture acreage in this region is projected to increase to 45,000 acres during this 20-year planning horizon.

In past water supply plans, improved pasture has not been included in the total water demands because of the uncertainty associated with irrigation practices and the number of acres of improved pasture. A review of the actual pumpage data provided by permit holders is insufficient to make projections at this time. The District did not include projections for improved pasture water use in this UEC Plan Update, but intends to work with the other water management districts and the FDEP on a cohesive statewide methodology. Water demand projections for improved pasture will be addressed in future water supply plans.

Miscellaneous – Cattle Watering

Water required for cattle watering is included in the miscellaneous crop category. This water demand category is calculated based on the number and type of cattle (beef or dairy). Demand projections for cattle watering are assumed to be 12 gallons per head, per day for beef cattle and 185 gallons per head, per day for dairy cattle: 35 gallons for drinking and 150 gallons for related barn washing.

Demands for miscellaneous cattle watering acreage (**Table A-55**) are projected to remain at the 2005 level throughout the 20-year planning horizon. Demand for cattle watering is included in the overall demand projections. For both the 2004 UEC Plan Update and the 2011 UEC Plan Update, cattle numbers were obtained from the most current FASS *Livestock Summary*.

Table A-55. Water requirements for miscellaneous – cattle watering acreage in the UEC Planning Area.

County/Area	Head of Beef Cattle	Head of Dairy Cattle	MGD
St. Lucie	22,000	0	0.3
Martin	12,000	0	0.1
Eastern Okeechobee	33,810	15,939	3.4
Total	67,810	15,939	3.8

Summary of Agricultural Results

Although estimates and projections for the agricultural subsections have been discussed in terms of crop/use categories, it is also important to summarize the results in terms of total acreage and use by county. Total irrigated agricultural crop categories and acreages are listed in **Table A-56**. Total irrigated agricultural acreages by county are presented in **Table 57**, while total agricultural net irrigation demands are presented **Table A-58**. Gross irrigation demands (water withdrawal demands) are presented in **Table A-59**.

Table A-56. UEC crop category and irrigated acreage summary.

Crop Category	2005	2010	2015	2020	2025	2030
Citrus	110,500	69,629	66,148	72,762–76,071	73,854–83,678	74,962–92,046
Sugarcane	10,379	10,379	10,379	10,379	10,379	10,379
Vegetables, Melons and Berries	8,252	7,839	7,427	7,015	6,602	6,189
Sod	5,485	5,211	4,937–5,211	4,662–5,211	4,388–5,211	4,114–5,211
Greenhouse/ Nursery	2,045	1,943	1,943	1,943	1,943	1,943
Other Fruits & Nuts	117	115	115	115	115	115
Total	136,778	95,116	90,949–91,223	96,876–100,733	97,281–107,928	97,702–115,883

Table A-57. Total irrigated agricultural acreage in the UEC Planning Area by county.

County	2005	2010	2015	2020	2025	2030
St. Lucie	70,313	51,392	48,848–48,912	52,944–55,247	53,408–60,061	53,882–65,374
Martin	58,304	37,593	36,273–36,371	37,853–39,000	37,846–40,963	37,843–43,144
Eastern Okeechobee	8,044	6,016	5,713–5,825	5,964–6,371	5,912–6,789	5,862–7,250
Total	136,661	95,001	90,834–91,108	96,761–100,618	97,166–107,813	97,587–115,768

Does not include the Other Fruits and Nuts crop category.

Table A-58. Net (finished) irrigation demands for total irrigated agricultural acreage in the UEC Planning Area.

County/Demand	2005	2010	2015	2020	2025	2030
Net Irrigation Demands for Average Conditions (MGD)						
Total	119	85	81	86–88	86–93	86–101
Net Irrigation Demands for 1-in-10 Year Drought Conditions (MGD)						
Total	165	115	114	119–122	118–129	118–138

Table A-59. Gross (raw) irrigation demands for total irrigated agricultural acreage in the UEC Planning Area.

County/Demand	2005	2010	2015	2020	2025	2030
Gross Irrigation Demands for Average Conditions (MGD)						
St. Lucie	79	59	56	60–62	61–68	62–74
Martin	66	46	45	46–47	46–49	45–51
Eastern Okeechobee	14	11	11	11	10–11	10–12
Total	159	116	112	117–120	117–128	117–137
Gross Irrigation Demands for 1-in-10 Year Drought Conditions (MGD)						
St. Lucie	100	74	71	77–80	76–85	77–92
Martin	98	67	66	69–70	68–72	67–76
Eastern Okeechobee	23	18	17	17–18	17–19	17–20
Total	221	159	154	163–168	161–176	161–188

TOTAL PLANNING AREA DEMAND AND PLAN COMPARISONS

Total Planning Area Demands

This section summarizes both the total net (user/customer) demands and total gross (water withdrawal) demands in the UEC Planning Area. The projects identified in this 2011 UEC Plan Update (Chapter 6 of the Planning Document and **Appendix C**) are designed to meet net, user/customer, demands. **Table A-60** shows net demands and **Table A-61** presents estimated gross demands from 2005 to 2030 for the UEC Planning Area for average and 1-in-10 year drought conditions.

Table A-60. Net (finished) water demands by water use category in the UEC Planning Area (MGD).

Water Use Category	2005	2010	2015	2020	2025	2030
Net (User/Customer) Demands for Average Conditions (MGD)						
Public Water Supply	42	49	57	67	80	92
Domestic Self-Supply	4	4	3	2	1	1
Industrial/Commercial/ Institutional Self-Supply	7	7	7	8	8	9
Recreational/Landscape Self-Supply	13	23	25	28	31	34
Power Generation Self-Supply	17	20	21	34	35	51
Agricultural Self-Supply	119	85	81	86–88	86–93	86–101
UEC Total	202	188	195	226–228	242–249	273–288
Net (User/Customer) Demands for 1-in-10 Year Drought Conditions (MGD)						
Public Water Supply	46	53	62	73	87	100
Domestic Self-Supply	5	4	4	3	1	1
Industrial/Commercial/ Institutional Self-Supply	7	7	7	8	8	9
Recreational/Landscape Self-Supply	17	30	33	36	40	44
Power Generation Self-Supply	17	20	21	34	35	51
Agricultural Self-Supply	165	115	114	119–122	118–129	118–138
UEC Total	256	229	239	273–276	290–300	323–345

Table A-61. Gross water demands by water use category in the UEC Planning Area (MGD).

Water Use Category	2005	2010	2015	2020	2025	2030
Gross (Withdrawal) Demands for Average Conditions (MGD)						
Public Water Supply	45	52	60	70	83	96
Domestic Self-Supply	5	4	4	3	2	1
Industrial/Commercial/ Institutional Self-Supply	7	7	7	8	8	9
Recreational/Landscape Self-Supply	17	31	34	37	41	45
Power Generation Self-Supply	17	20	21	34	35	51
Agricultural Self-Supply	159	116	112	117–120	117–128	117–137
UEC Total	250	230	238	270–273	287–298	320–340
Gross (Withdrawal) Demands for 1-in-10 Year Drought Conditions (MGD)						
Public Water Supply	49	56	66	77	91	105
Domestic Self-Supply	5	4	4	3	1	1
Industrial/Commercial/ Institutional Self-Supply	7	7	7	8	8	9
Recreational/Landscape Self-Supply	22	40	44	48	53	58
Power Generation Self-Supply	17	20	21	34	35	51
Agricultural Self-Supply	221	159	154	163–168	161–176	161–188
UEC Total	321	287	296	333–338	350–362	385–412

Comparison of 2006 UEC Plan Amendment and 2011 UEC Plan Update Projected Water Demands

Table A-62 compares the projected average gross (raw) water demands estimated in the 2006 UEC Plan Amendment with those estimated for the 2011 UEC Plan Update.

Table A-62. End-point projections of gross (raw) average water demands in the 2006 UEC Plan Amendment and 2011 UEC Plan Update using gross demand.

Water Use Category	2006 UEC Plan Amendment Average Demands for 2025 (MGD)	2011 UEC Plan Update Average Demands for 2030 (MGD)
Public Water Supply	101.9	96.4
Domestic Self-Supply	2.7	0.7
Industrial/Commercial/Institutional Self-Supply	4.9	9.4
Recreational/Landscape Self-Supply	23.8	45.0
Power Generation Self-Supply	47.6	51.3
Agricultural Self-Supply	197.1	117–137.0
UEC Total	378.0	319.7–339.7

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B

Information for Local Government Comprehensive Plans

The South Florida Water Management District (SFWMD or District) prepares water supply plans for each of its four planning areas to effectively support planning initiatives and address local issues. The regional water supply plans encompass a 20-year future planning horizon and are updated every five years. All local governments within each planning area are required by statute to update their 10-Year Water Supply Facilities Work Plans (Facilities Work Plans), and adopt revisions to their comprehensive plans, within 18 months following the approval of this UEC Plan Update.

The *2011 Upper East Coast Water Supply Plan Update* (2011 UEC Plan Update) and this accompanying set of appendices contain water supply planning information useful to local governments for preparing and amending comprehensive plans. In addition to this appendix, the following chapters and appendices are particularly relevant for local governments:

Water Sources	Chapters 4 and 6; Appendix C
Utility Areas Served (2010 & 2030)	Appendices B and D
Population Projections (2005–2030)	Chapter 2; Appendix A
Demand Projections (2005–2030)	Chapter 2; Appendix A
Water Supply Projects (2005–2030)	Chapter 6; Appendix C

This appendix includes the following information useful for the review and revision of local government comprehensive plans:

1. The South Florida Water Management District's (SFWMD or District) Checklist of Needed Comprehensive Plan Data
2. Relevant portions of cited statutory provisions
3. Tables identifying which utilities serve each UEC Planning Area jurisdiction
4. Maps of utility areas currently served (2010) and future utility area service (2030)

1. CHECKLIST OF NEEDED COMPREHENSIVE PLAN DATA

Local governments are required to plan for their water and wastewater needs along with other infrastructure and public service elements of their comprehensive growth management. This section provides a general checklist of the type of data and information that the SFWMD water supply planning staff look for during their review of the water supply issues included in local government comprehensive plans. This checklist is not all-inclusive, but it provides a broad, general framework for use with the more detailed Florida Department of Community Affairs (FDCA) related guidelines and SFWMD comments on specific water supply issues.

Checklist guidance is given for three water supply-related aspects of comprehensive plans:

A. 10-Year Water Supply Facilities Work Plan and other Potable Water Sub-Element revisions
B. Evaluation & Appraisal Report (EAR) reporting requirements
C. Plan Amendments (future land use change)

A. 10-Year Water Supply Facilities Work Plan and Other Potable Water Sub-Element Revisions

(Within 18 months following publication of this UEC Water Supply Plan Update)

Overall Guidance

For consistency in the water supply planning process, the SFWMD, local governments, and utilities work closely with the FDCA, projecting demands and proposing water supply projects for the future as outlined in the updated regional water supply plan. The 2011 UEC Plan Update provides water demand estimates, water source options, and water supply development projects to ensure adequate water supplies to support the region. Local governments should demonstrate consistency with the regional water supply plan when developing or updating their Facilities Work Plans. The following guidance is provided to local governments for updating their water supply Facilities Work Plans.

Review the 2011 UEC Plan Update and confirm the major Public Water Supply entities that provide service within the local government's jurisdiction

To be consistent with the regional water supply plan, the local government's Facilities Work Plan should be in agreement with the major Public Water Supply (PWS) entities serving most of the urban population. The 2011 UEC Plan Update identifies PWS entities with projected average pumpage greater than 0.1 MGD, serving the bulk of the urban population. Some smaller communities or municipalities may not be identified. The FDCA guidance for

Facilities Work Plans recommends including small community systems and self-supplied users on private wells.

The 2011 UEC Plan Update provides information about PWS entities and urban water use by PWS service area. To be consistent with the regional water supply plan, at a minimum, the Facilities Work Plan should identify the urban water demand and adequacy of PWS water sources within the municipal boundary to meet such water demand. If appropriate, the sale or purchase of water from PWS entities with service areas outside of the municipal boundary should also be identified. Note that municipal boundaries and land use are not primary determinants of water use.

Review the Public Water Supply Utility Summaries provided in Chapter 6 of the 2011 UEC Plan Update

The SFWMD worked with the staff from PWS entities to identify water supply development projects for the 2011 UEC Plan Update. Utility Summaries were compiled using information from various sources, including input from PWS entities. The Utility Summaries provide baseline information about finished water demands, existing permitted sources and allocations, recently constructed and proposed projects that create water capacity, as well as other related information. Note that multiple sources of water supply may be needed to accommodate projected water demand in future years. Public Water Supply entity staff should confirm the information provided in the Utility Summaries of the 2011 UEC Plan Update. Subsequent to adoption of the regional water supply plan, Public Water Supply entities must respond to the SFWMD with their intentions to develop and implement the projects identified by this Plan Update, or provide a list of other projects or methods to meet water demands.

To be consistent with the regional water supply plan, the local government's Facilities Work Plan should be in general agreement with the 2011 UEC Plan Update Utility Summary's water sources and schedule of water sources to be made available to meet projected water demands. However, it is not necessary to use the same population projections or per capita use rates used by the regional water supply plan to project water demand. Professional planning methods may be used as input to the local planning process, which may result in differences between the demand and supply estimates provided in the 2011 UEC Plan Update Utility Summaries. If planning assumptions or information differs from what is provided in the Utility Summaries, the Facilities Work Plan should identify and explain the basis for any differences.

Furthermore, consistency between a Facilities Work Plan and regional water supply plan does not require the same planning horizons. The minimum planning horizon for regional water supply plans is 20 years. The historical perspectives for the regional hydrologic assumptions are even longer in duration. Regional water supply plans are updated every five years. As the updated regional water supply plan is implemented through water use regulations, a high priority is placed on the ability of local water supply projects to be permitted in advance of demand within the near term (five-year increment); however, a

10-year planning horizon is required [Paragraph 163.3177(5)(a), Florida Statues (F.S.)] and a 20-year planning horizon is preferred.

Additional information about developing a 10-Year Water Supply Facilities Work Plan, including guidelines and a template for a Facilities Work Plan, is available on the FDCA website, http://www.dca.state.fl.us/fdcp/dcp/WaterSupplyPlanning/index.cfm.

Checklist of Key Considerations

Water Supply Demand Projections

- Review this 2011 UEC Plan Update and revise the local government's adopted Facilities Work Plan to be consistent with the water demand estimates and population projections cited in the 2011 UEC Plan Update.

  The objective is to provide best available data. If the local government data is better than the data provided in the 2011 UEC Plan Update, the local government data should be used in the Facilities Work Plan. All differences in water demand estimates and population projections used in the Facilities Work Plan should be identified and explained.
  - Plan for both raw and finished (i.e., water after any losses due to water treatment) water supply demands within the city or county jurisdiction for each supplier.
  - In addition, the projections should cover at least a 10-year planning period, but projections for the entire established planning period are preferred.
  - The projections should plan for the building of all public, private, and regional water supply facilities and bulk sales of water that will be necessary to provide water supply service within the local government's jurisdiction.

Water Source Identification

- Review the water supply sources, which were identified by the jurisdiction as necessary to meet and achieve the existing and projected water use demand for the established planning period.
  - Compare this information with the available sources in the 2011 UEC Plan Update.

- Provide separate projections for existing and future self-supply.
  - Also, identify the general areas served by self-supply.

Water Supply Project Identification

- Either incorporate water supply project(s) selected by the local government, as identified in the regional water supply plan, or propose alternatives for inclusion in the Facilities Work Plan.
  - All other public and private water supply improvements necessary to maintain level of service standards within the jurisdiction should also be included in the Facilities Work Plan.

- Coordinate the Facilities Work Plan water supply projects with the 2011 UEC Plan Update and the water supplier(s) annual progress reports.
    - Update the Facilities Work Plan accordingly.

- Identify sufficient water conservation, reuse, and water supply projects necessary to meet projected demands.

- Update the Capital Improvements Element as required.

Water Supply Intergovernmental Coordination

- The Facilities Work Plan should address ongoing and future coordination with existing water supply and reuse providers for meeting future demands.

- Review existing and future utility service areas for each provider within the jurisdiction. Refer to the maps provided in this appendix. Compare and update the Facilities Work Plan as needed.
    - Identify existing or potential service area conflicts and solutions. Include a conflict resolution policy.

- Review and update the Facilities Work Plan language concerning needed coordination with water supplier(s), other local governments and entities, and others.
    - Include updates to agreements (e.g., bulk service agreements and interconnect agreements).

Related Comprehensive Plan Amendments

- If additional revisions are needed for coordination with the 2011 UEC Plan Update, but not listed here, incorporate changes into the comprehensive plan and Facilities Work Plan, as appropriate.

  The 2011 UEC Plan Update will require changes to the Facilities Work Plan and possibly other elements within the comprehensive plan. Revisions may include population projections, established planning period, future water resource projects, and the Capital Improvements Element.
    - Review the comprehensive plan for consistency between all elements of the Facilities Work Plan and other comprehensive plan elements in consideration of all proposed updates.

B. Evaluation & Appraisal Report (EAR) Paragraph 163.3191(2)(L), F.S.

(Submitted after the adoption of a 10-Year Water Supply Facilities Work Plan)

Water Supply Project Identification and Selection

- Identify the extent to which the local government has been successful in identifying water supply projects, including water conservation and reuse, necessary to meet projected demands.
- Evaluate the degree to which the 10-Year Water Supply Facilities Work Plan has been implemented for building all public, private, and regional water supply facilities within the jurisdiction necessary to meet projected demands.
- Include recommendations for revising the Facilities Work Plan and the applicable comprehensive plan elements to address the conclusions of the evaluation, as necessary.

C. Plan Amendments (Future Land Use Change)

Water Supply Demand Projections

- Address both raw and finished (i.e., after any losses due to water treatment) water supply needs for both potable and nonpotable (i.e., irrigation) demands, using professionally acceptable methodologies for population projections and per capita use rates.
- Address existing and future water conservation and reuse commitments, and levels of service (i.e., per capita use rates), for both the proposed future land use change and the comprehensive plan.
- Address both the build-out time frame for a proposed future land use change, and the established planning time frame for the comprehensive plan.

Water Source Identification

- For existing demands, reflect water source(s) from supplier's consumptive use permit (CUP).
- For future demands covered by a supplier's commitment to provide service under remaining available capacity of an existing consumptive use permit, reflect the source(s) from the supplier's CUP, including bulk supply contracted quantities and duration, and provider.
- For future demands not covered by an existing CUP, provide sufficient planning-level data and analysis to demonstrate the availability of a sustainable water source as identified in the appropriate District regional water supply plan.

Availability of Water Supply and Public Facilities

- Demonstrate that there is an availability of raw water supply from the proposed source(s) of raw supply for the future land use change, given all other approved land use commitments within the local government's jurisdiction over both the proposed amendment's build-out and the established planning period of the comprehensive plan [see Subsection 163.3167(13), F.S., and Paragraph 163.3177(6)(a), F.S.].

- Demonstrate that there is an availability of both treatment facility capacity and permitted, available finished water supply for the future land use change, given all other commitments for that capacity and supply over the proposed build-out time frame.
- If the availability of either water supply and/or public facilities is not currently demonstrable, this will require either phasing of the future land use [see Paragraph 163.3177(10)(h), F.S.], and/or appropriate amendments to the Capital Improvements Element/Potable Water Sub-Element, to ensure the necessary capital planning and timely availability of the needed infrastructure and water supply [see Paragraphs 163.3177(3)(a) and (6)(c), F.S.].
- If the water provider is an entity other than the local government responsible for the comprehensive plan amendment, demonstrate that coordination of the plan amendment has occurred between the water provider and the local government.

Related Comprehensive Plan Amendments

- A future land use change may also require amendments to other specific elements within the comprehensive plan if it requires an adjustment to either the plan's future population or demand projections, the comprehensive plan's established planning period, or the water supply sources required to be addressed in the comprehensive plan [see Subsection 163.3167(13), F.S., and Paragraphs 163.3177(5)(a), 163.3177(6)(a), 163.3177(6)(c), and 163.3177(6)(d), F.S.].

2. CITED STATUTORY PROVISIONS (RELEVANT PORTIONS)

163.3167(13), F.S.: Each local government shall address in its comprehensive plan, as enumerated in this chapter, the water supply sources necessary to meet and achieve the existing and projected water use demand for the established planning period, considering the applicable plan developed pursuant to s. 373.0361.

163.3177(3)(a), F.S.: The comprehensive plan shall contain a capital improvements element designed to consider the need for and the location of public facilities in order to encourage the efficient use of such facilities and set forth:

1. A component that outlines principles for construction, extension, or increase in capacity of public facilities, as well as a component that outlines principles for correcting existing public facility deficiencies, which are necessary to implement the comprehensive plan. The components shall cover at least a five-year period.

2. Estimated public facility costs, including a delineation of when facilities will be needed, the general location of the facilities, and projected revenue sources to fund the facilities.

3. Standards to ensure the availability of public facilities and the adequacy of those facilities, including acceptable levels of service.

4. Standards for the management of debt.

5. A schedule of capital improvements which includes publicly funded projects, and which may include privately funded projects for which the local government has no fiscal responsibility, necessary to ensure that adopted level-of-service standards are achieved and maintained. For capital improvements that will be funded by the developer, financial feasibility shall be demonstrated by being guaranteed in an enforceable development agreement or interlocal agreement pursuant to paragraph (10)(h), or other enforceable agreement. These development agreements and interlocal agreements shall be reflected in the schedule of capital improvements if the capital improvement is necessary to serve development within the five-year schedule. If the local government uses planned revenue sources that require referenda or other actions to secure the revenue source, the plan must, in the event the referenda are not passed or actions do not secure the planned revenue source, identify other existing revenue sources that will be used to fund the capital projects or otherwise amend the plan to ensure financial feasibility.

6. The schedule must include transportation improvements included in the applicable metropolitan planning organization's transportation improvement program adopted pursuant to s. 339.175(8) to the extent that such improvements are relied upon to ensure concurrency and financial feasibility. The schedule must also be coordinated with the applicable metropolitan planning organization's long-range transportation plan adopted pursuant to s. 339.175(7).

163.3177(5)(a), F.S.: Each local government comprehensive plan must include at least two planning periods, one covering at least the first five-year period occurring after the plan's adoption and one covering at least a 10-year period.

163.3177(6)(a), F.S.: A future land use plan element designating proposed future general distribution, location, and extent of the uses of land for residential uses, commercial uses, industry, agriculture, recreation, conservation, education, public buildings and grounds, other public facilities, and other categories of the public and private uses of land….The future land use plan shall be based upon surveys, studies, and data regarding the area, including the amount of land required to accommodate anticipated growth; the projected population of the area; the character of undeveloped land; the availability of water supplies, public facilities, and services;…

163.3177(6)(c), F.S.: A general sanitary sewer, solid waste, drainage, potable water, and natural groundwater aquifer recharge element correlated to principles and guidelines for future land use, indicating ways to provide for future potable water, drainage, sanitary sewer, solid waste, and aquifer recharge protection requirements for the area. The element may be a detailed engineering plan including a topographic map depicting areas of prime groundwater recharge. The element shall describe the problems and needs and the general facilities that will be required for solution of the problems and needs. The element shall also include a topographic map depicting any areas adopted by a regional water management district as prime groundwater recharge areas for the Floridan or Biscayne aquifers. These areas shall be given special consideration when the local government is engaged in zoning or considering future land use for said designated areas. For areas served by septic tanks, soil surveys shall be provided which indicate the suitability of soils for septic tanks. Within 18 months after the governing board approves an updated regional water supply plan, the element must incorporate the alternative water supply project or projects selected by the local government from those identified in the regional water supply plan pursuant to s. 373.0361(2)(a) or proposed by the local government under s. 373.0361(8)(b). If a local government is located within two water management districts, the local government shall adopt its comprehensive plan amendment within 18 months after the later updated regional water supply plan. The element must identify such alternative water supply projects and traditional water supply projects and conservation and reuse necessary to meet the water needs identified in s. 373.0361(2)(a) within the local government's jurisdiction and include a work plan, covering at least a 10-year planning period, for building public,

private, and regional water supply facilities, including development of alternative water supplies, which are identified in the element as necessary to serve existing and new development. The work plan shall be updated, at a minimum, every five years within 18 months after the governing board of a water management district approves an updated regional water supply plan. Amendments to incorporate the work plan do not count toward the limitation on the frequency of adoption of amendments to the comprehensive plan. Local governments, public and private utilities, regional water supply authorities, special districts, and water management districts are encouraged to cooperatively plan for the development of multijurisdictional water supply facilities that are sufficient to meet projected demands for established planning periods, including the development of alternative water sources to supplement traditional sources of groundwater and surface water supplies.

163.3177(6)(d), F.S.: A conservation element for the conservation, use, and protection of natural resources in the area, including air, water, water recharge areas, wetlands, waterwells, estuarine marshes, soils, beaches, shores, flood plains, rivers, bays, lakes, harbors, forests, fisheries and wildlife, marine habitat, minerals, and other natural and environmental resources, including factors that affect energy conservation. Local governments shall assess their current, as well as projected, water needs and sources for at least a 10-year period, considering the appropriate regional water supply plan approved pursuant to s. 373.0361, or, in the absence of an approved regional water supply plan, the district water management plan approved pursuant to s. 373.036(2). This information shall be submitted to the appropriate agencies…

163.3177(10)(h), F.S.: It is the intent of the Legislature that public facilities and services needed to support development shall be available concurrent with the impacts of such development in accordance with s. 163.3180. In meeting this intent, public facility and service availability shall be deemed sufficient if the public facilities and services for a development are phased, or the development is phased, so that the public facilities and those related services which are deemed necessary by the local government to operate the facilities necessitated by that development are available concurrent with the impacts of the development. The public facilities and services, unless already available, are to be consistent with the capital improvements element of the local comprehensive plan as required by paragraph (3)(a) or guaranteed in an enforceable development agreement. This shall include development agreements pursuant to this chapter or in an agreement or a development order issued pursuant to chapter 380. Nothing herein shall be construed to require a local government to address services in its capital improvements plan or to limit a local government's ability to address any service in its capital improvements plan that it deems necessary.

163.3191(2)(l), F.S.: The extent to which the local government has been successful in identifying alternative water supply projects and traditional water supply projects, including conservation and reuse, necessary to meet the water needs identified in s. 373.0361(2)(a) within the local government's jurisdiction. The report must evaluate the degree to which the local government has implemented the work plan for building public, private, and regional water supply facilities, including development of alternative water supplies, identified in the element as necessary to serve existing and new development.

3. TABLES SHOWING WHICH UTILITIES SERVE WHICH JURISDICTIONS

This portion of the appendix contains two tables showing local government jurisdictions and the utilities that provide raw or finished water to those local governments. These utilities have treatment capacity greater than 0.1 MGD. **Table B-1** is listed by local governments within the UEC Planning Area. **Table B-2** is listed by utilities serving specific local government jurisdictions within the UEC Planning Area.

Table B-1. Utilities and entities that serve local governments in the UEC Planning Area.

Local Government	Local Government Utility	Other Utility Serving Local Government
Martin County		
Martin County *(unincorporated)*	Yes	South Martin Regional Utility, Indiantown Company, City of Stuart, Town of Jupiter, and Village of Tequesta
Jupiter Island, Town of	Local Government Owned	South Martin Regional Utility (owned by Town of Jupiter Island)
Ocean Breeze Park	No	Martin County Utilities
Sewall's Point, Town of	No	Martin County Utilities
Stuart, City of	Yes	N/A
Jupiter, Town of[a]	Yes	N/A
Tequesta, Village of[a]	Yes	N/A
Okeechobee County		
Okeechobee County[b] *(unincorporated)*	No	N/A
St. Lucie County		
St. Lucie County *(unincorporated)*	Yes	Fort Pierce Utilities Authority
Fort Pierce, City of	Yes	N/A
Port St. Lucie, City of	Yes	St. Lucie West Services District, Reserve Community Development District
St. Lucie Village	No	Fort Pierce Utilities Authority

a. The Town of Jupiter and the Village of Tequesta have utility service areas in both Martin and Palm Beach counties. This document only references the portion located within Martin County. (The 2012 LEC Water Supply Plan Update will address the whole utility, including both counties for Jupiter and Tequesta).

b. The utilities in Okeechobee will be addressed in the 2012 Kissimmee Basin Water Supply Plan Update. Presently, there are no utilities in the eastern portion of Okeechobee County, which is part of the UEC Planning Area.

Table B-2. Utilities and local governments that serve the UEC Planning Area.

Utility/Entity Name	Local Government Utility	Local Governments Served
Martin County		
Indiantown Company	No	Unincorporated Martin County
Jupiter, Town of[a]	Yes	Unincorporated Martin County
Tequesta, Village of[a]	Yes	Unincorporated Martin County
Martin County Utilities	Yes	Unincorporated Martin County (portions serving Floridian Golf Resort, Jensen Beach, Martin Downs, Palm City, Port Salerno, Tropical Farms, Miles Grant Golf and Country Club, Indian River Plantation, South Hutchinson Island), City of Stuart (portion), Ocean Breeze Park, and Town of Sewell's Point
Martin Correctional Institution	No	Unincorporated Martin County
Piper's Landing	No	Unincorporated Martin County (serving Piper's Landing Yacht & Country Club)
Sailfish Point	No	Unincorporated Martin County (serving Sailfish Point development)
South Martin Regional Utility (SMRU)	Yes	Town of Jupiter Island, Hobe Sound vicinity, and portions of southeastern unincorporated Martin County
Stuart, City of	Yes	City of Stuart and unincorporated Martin County (portion)
St. Lucie County		
Fort Pierce Utilities Authority (FPUA)	Yes	City of Fort Pierce, St. Lucie Village, and bulk water to St. Lucie County Utilities
Harbour Ridge	No	Unincorporated St. Lucie County (serving Harbour Ridge Country Club)
Panther Woods Master Association	No	Unincorporated St. Lucie County (serving Panther Woods)
Port St. Lucie Utility Systems Department, City of	Yes	City of Port St. Lucie (including the larger portion of The Reserve development) and portions of unincorporated St. Lucie County
Reserve Community Development District (CDD)	No	City of Port St. Lucie (serving a portion of The Reserve development)
Spanish Lakes Fairways	No	Unincorporated St. Lucie County (serving Spanish Lakes Fairways and Country Club Village)

Utility/Entity Name	Local Government Utility	Local Governments Served
St. Lucie County Utilities Department	Yes	Unincorporated St. Lucie County (serving north county area, mainland county area, and South Hutchinson Island). Distributes bulk water purchases from FPUA to unincorporated St. Lucie County (serving North Hutchinson Island, Indian River Estates, Portofino Shores, and the Midway Road–Okeechobee Road Corridor)
St. Lucie West Services District (SLWSD)	No	City of Port St. Lucie (serving St. Lucie West development). The SLWSD has an agreement with the Reserve CDD to provide water to the original section of The Reserve

a. The Town of Jupiter and the Village of Tequesta have utility service areas in both Martin and Palm Beach counties. This document only references the portion located within Martin County. (The 2012 LEC Water Supply Plan Update will address the whole utility, including both counties for Jupiter and Tequesta).

District staff worked with the utilities to map service boundaries for the utility service areas, as shown in **Figure B-1** through **Figure B-4**. In particular, the St. Lucie County utility service area boundary reflects a water supply planning boundary for this 2011 UEC Plan Update. However, it should be noted that the permit utility boundary for St. Lucie County (SFWMD Consumptive Use Permit for St. Lucie County 56-00406-W) encompasses the whole of St. Lucie County, which is not otherwise served by another existing utility in the utility service areas of St. Lucie County as shown in **Figure B-3** and **Figure B-4**.

4. MAPS OF UTILITY AREAS CURRENTLY SERVED (2010) AND FUTURE UTILITY AREA SERVICE (2030)

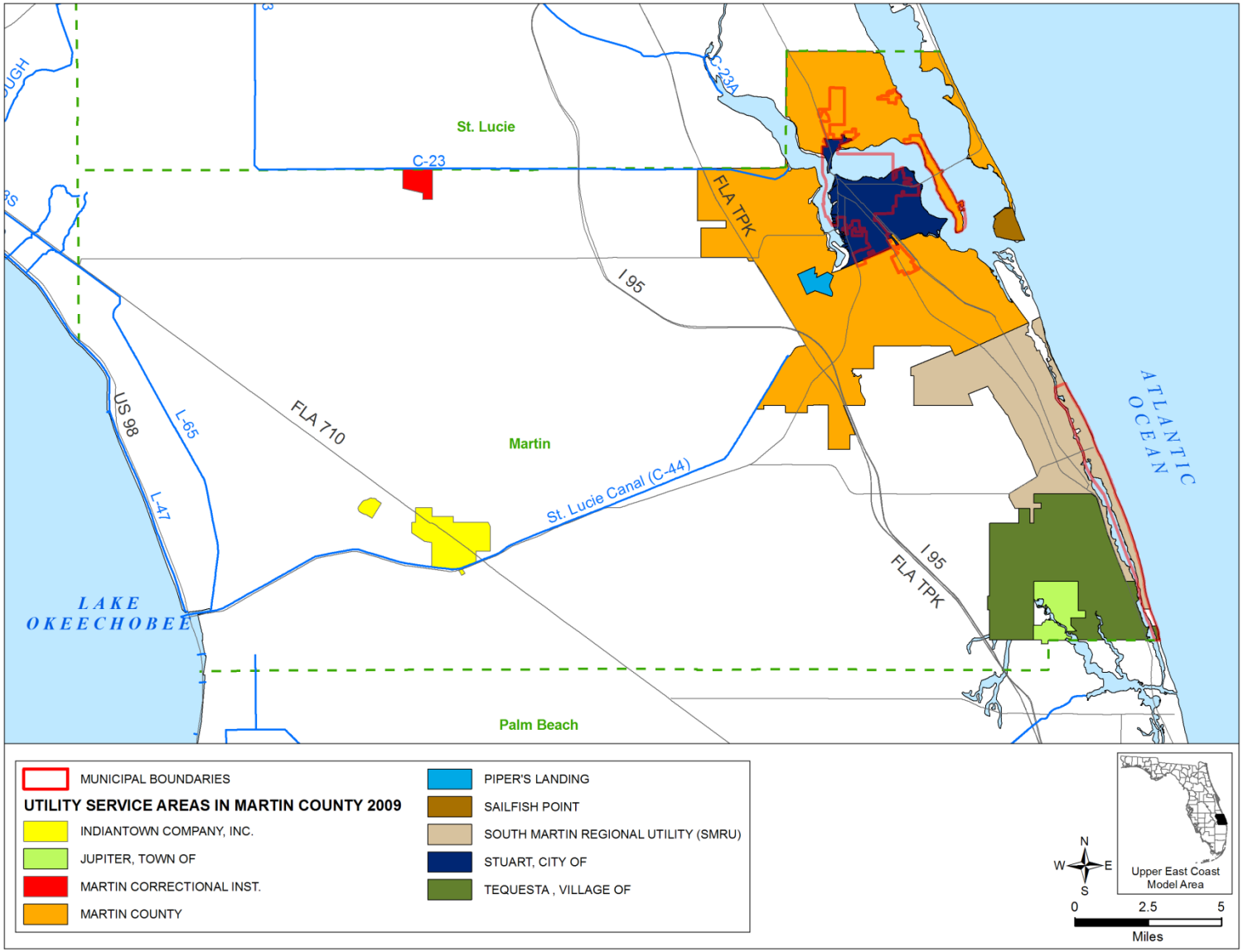

Figure B-1. 2009 Utility Service Areas in Martin County.

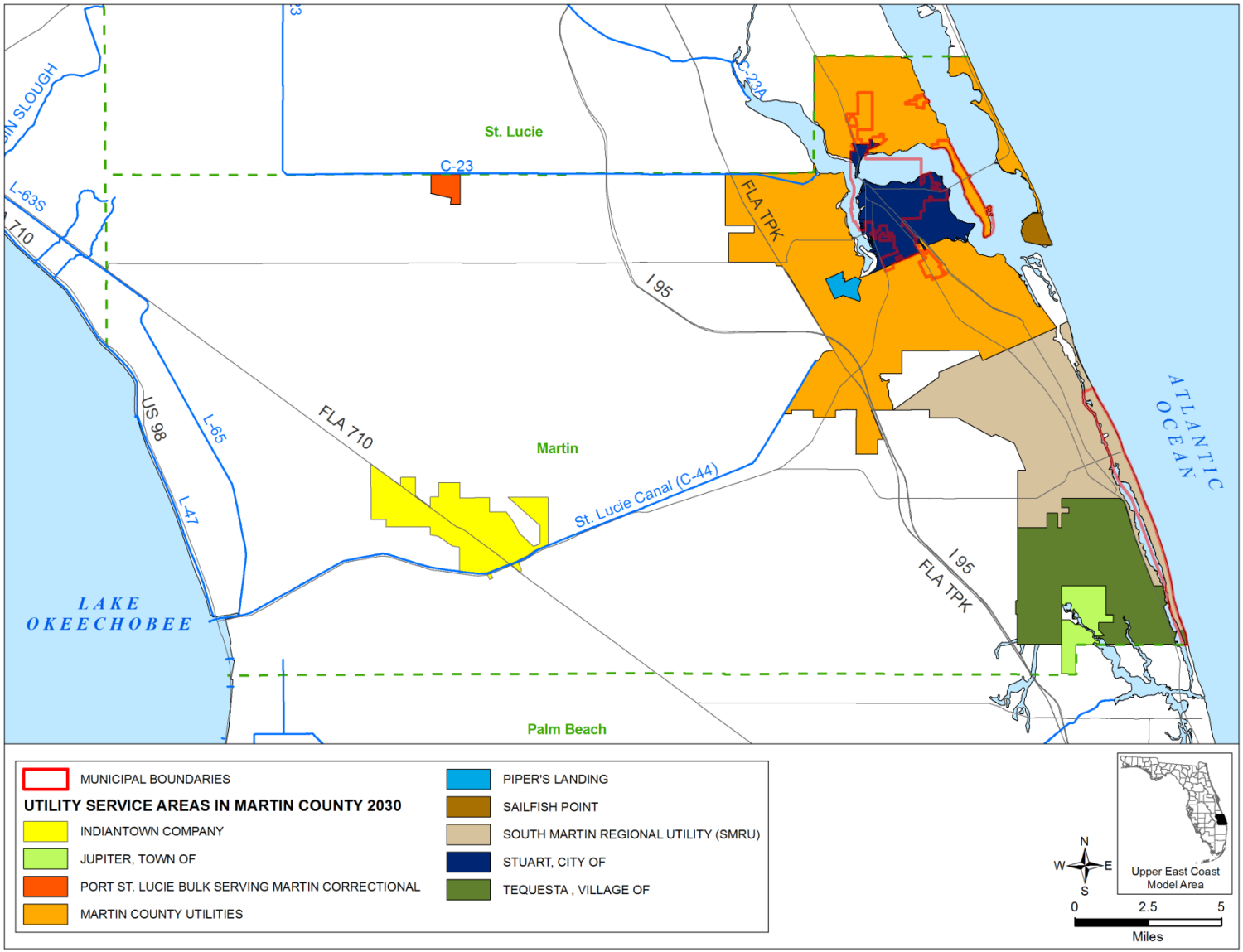

Figure B-2. 2030 Utility Service Areas in Martin County.

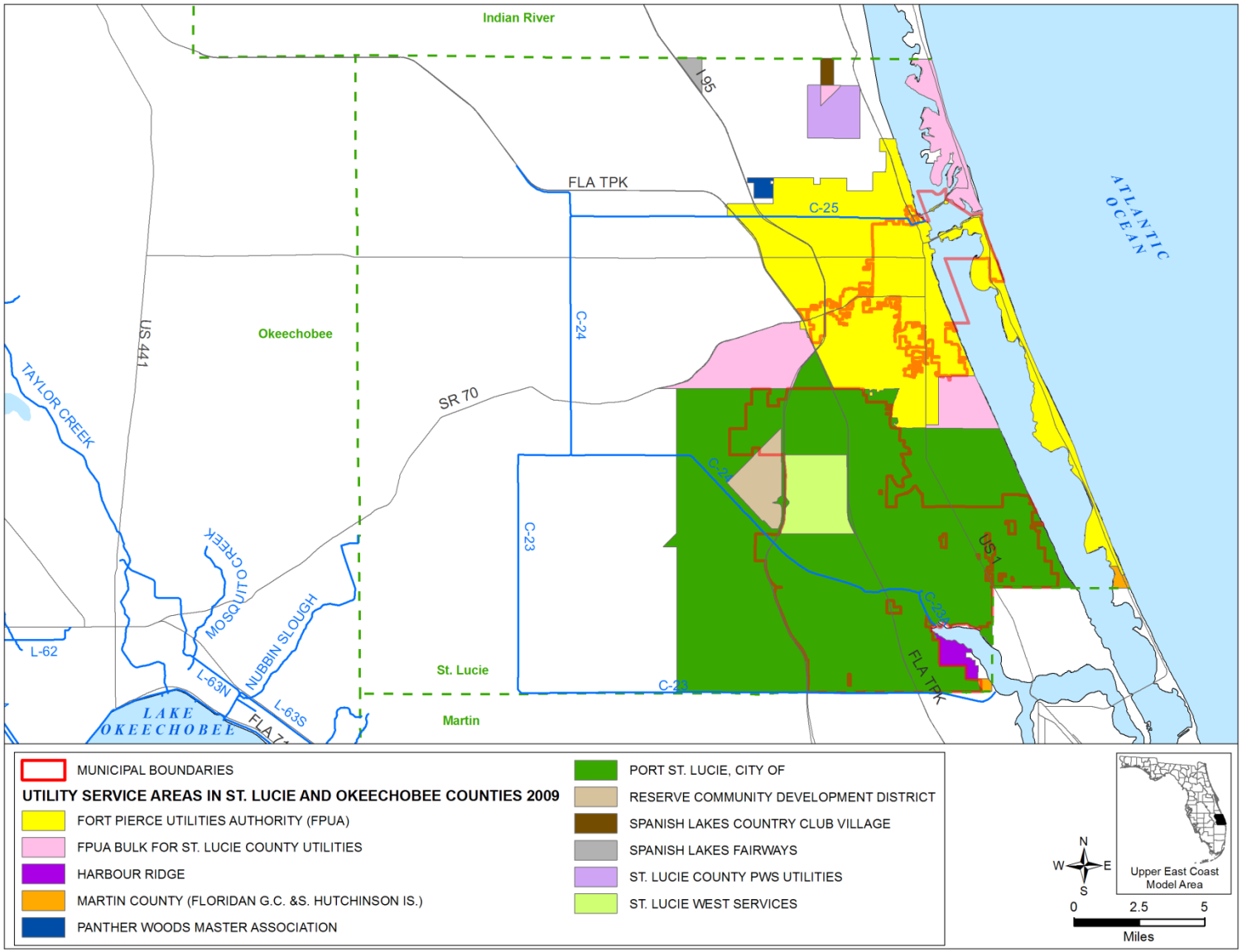

Figure B-3. 2009 Utility Service Areas in St. Lucie County.

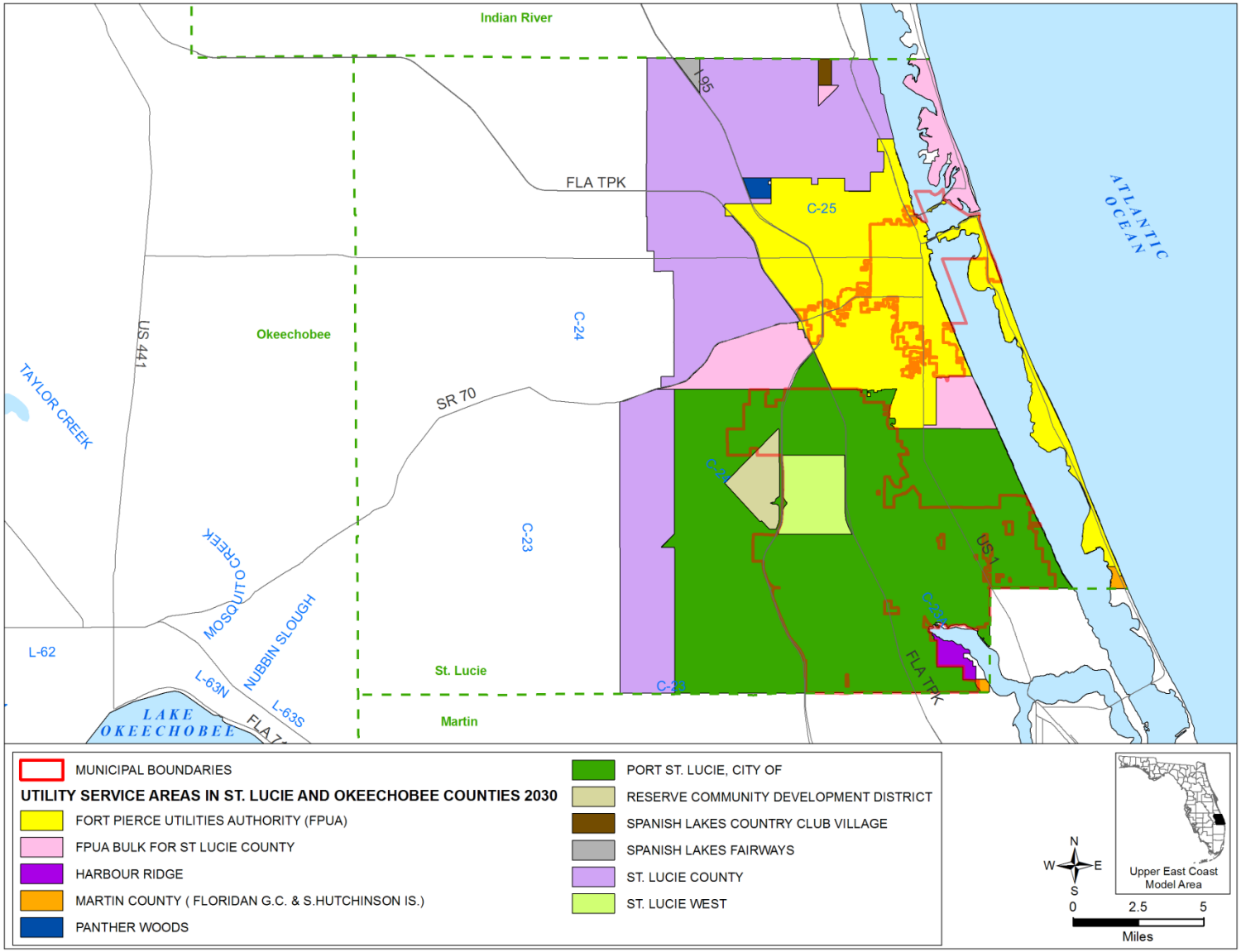

Figure B-4. 2030 Utility Service Areas in St. Lucie County.

C
Water Supply Development Projects

Summary tables of all water supply development projects follow. Proposed water supply development projects from 2010–2030 are provided in **Table C-1**. Constructed water supply projects that received funds from the District's Alternative Water Supply Funding Program between Fiscal Year (FY) 2006 and FY 2009 are shown in **Table C-2**.

Table C-1. 2010–2020 proposed water supply development projects.

County	Utility/Entity	Water Source Type	Facility	Project	Total Capital Costs $M	Total Design Capacity (MGD)				
						2010	2011–2015	2016–2020	2021–2025	2026–2030
Martin	Indiantown Company	Fresh Water	Indiantown	Water Treatment Facility (WTF) Expansion from 1.3 MGD to 1.9 MGD	$ 3.20	0.00	0.00	0.00	0.00	0.60
Martin	Martin Correctional Institution	Brackish		Memorandum of Understanding (MOU) with Port St. Lucie Utility Systems to Provide up to 0.35 MGD	TBD	0.15	0.35	0.35	0.35	0.35
Martin	Martin County Utilities	Brackish	Tropical Farms	WTF Expansion from 10 MGD to 14 MGD	$ 9.50	0.00	4.00	4.00	4.00	4.00
Martin	Martin County Utilities	Reclaimed	Tropical Farms	WWTF Expansion Phase 2 from 5 MGD to 7.5 MGD, Phase 2	$ 9.20	0.00	0.00	0.00	2.50	2.50
Martin	Martin County Utilities	Reclaimed	North/ Jensen	WWTF Expansion from 2.4 MGD to 3.6 MGD	$ 8.80	0.00	0.00	1.20	1.20	1.20
Martin	South Martin Regional Utility (SMRU)	Brackish	SMRU	Reverse Osmosis (RO) WTF Expansion from 2.0 MGD to 4.2 MGD	$ 3.50	0.00	0.00	2.20	2.20	2.20
Martin	South Martin Regional Utility	Reclaimed	SMRU	WWTF Supplemental Irrighation Quality (IQ) Sources	$ 1.00	0.00	0.00	1.00	1.00	1.00

County	Utility/Entity	Water Source Type	Facility	Project	Total Capital Costs $M	Total Design Capacity (MGD)				
						2010	2011–2015	2016–2020	2021–2025	2026–2030
Martin	City of Stuart	Brackish		MOU with Martin County Utilities to Purchase Floridan Water from 0.15 MGD to 0.84 MGD	$ 0.05	0.15	0.15	0.49	0.49	0.84
Martin	City of Stuart	Reclaimed	Stuart	Wastewater Treatment Facility (WWTF) Expansion Final Phase and Reclaimed Water Transmission Main to Interconnect with Martin County	$ 3.00	0.00	2.33	2.33	2.33	2.33
St. Lucie	Fort Pierce Utilities Authority	Brackish	Henry Gahn	Water Treatment Facility (WTF) Expansion from 6.99 MGD to 14.99 MGD; Includes Floridan Aquifer Wells	$ 19.80	0.00	0.00	8.00	8.00	8.00
St. Lucie	Fort Pierce Utilities Authority	Reclaimed	Mainland	Water Reclamation Facility Phase 1	$ 55.60	0.00	0.00	5.00	5.00	5.00
St. Lucie	City of Port St. Lucie Utility Systems Department	Brackish	Rangeline	Construct 10 MGD RO WTF and Expand to 30 MGD with Water Mains and Facilities	$ 75.20	0.00	0.00	20.00	20.00	30.00

County	Utility/Entity	Water Source Type	Facility	Project	Total Capital Costs $M	Total Design Capacity (MGD)				
						2010	2011–2015	2016–2020	2021–2025	2026–2030
St. Lucie	City of Port St. Lucie Utility Systems Department	Reclaimed	Westport	WWTF Expansion from 2 MGD to 12 MGD with Reuse Mains and Facilities	$ 2.80	10.00	10.00	10.00	10.00	10.00
St. Lucie	City of Port St. Lucie Utility Systems Department	Reclaimed	Glades	WWTF Expansion from 12 MGD to 24 MGD with Reuse Water Mains and Facilities	$ 16.90	0.00	0.00	0.00	0.00	12.00
St. Lucie	Reserve Community Development District	Brackish		MOU with St. Lucie West Services District to Purchase Alternative Bulk Water until 2024 with Automatic Five-Year Incremental Renewals	TBD	0.25	0.25	0.30	0.50	0.50
St. Lucie	St. Lucie County Utilities	Brackish	Northwest	Construct 2.0 MGD RO WTF (2011–2015) and Expand by 2 MGD (2016–2020) to 4 MGD	$ 24.00	0.00	2.00	4.00	4.00	4.00
St. Lucie	St. Lucie County Utilities	Brackish	Central	Construct 2.0 MGD RO WTF (2011–2015) and Expand by 2 MGD (2016–2020) to 4 MGD	$ 24.00	0.00	2.00	4.00	4.00	4.00

County	Utility/Entity	Water Source Type	Facility	Project	Total Capital Costs $M	Total Design Capacity (MGD)				
						2010	2011–2015	2016–2020	2021–2025	2026–2030
St. Lucie	St. Lucie County Utilities	Brackish	South	Construct 2.0 MGD RO WTF (2011–2015) and Expand by 2 MGD (2016–2020) to 4 MGD	$ 24.00	0.00	0.00	4.00	4.00	4.00
St. Lucie	St. Lucie County Utilities	Reclaimed	North Hutchinson Island	WWTF Expansion from 0.5 MGD to 0.8 MGD	$ 4.00	0.30	0.30	0.30	0.30	0.30
St. Lucie	St. Lucie West Services District (SLWSD)	Brackish	SLWSD	RO WTF Expansion from 3.4 MGD to 3.6 MGD	$ 2.00	0.00	0.00	0.00	0.00	0.20

Table C-2. FY 2006–FY 2009 completed water supply development projects.

County	Utility/Entity	Water Source Type	Facility	Project	Total Capital Costs $M	Total Design Capacity
Martin	Indiantown Company	Reclaimed	Indiantown	WWTF Reclaimed Water Production Facility; Water Main to Cogeneration Power Plant; and Reuse Upgrades (2007–2008)	$ 2.40	1.00
Martin	Martin County Utilities	Brackish	Tropical Farms	WTF Expansion and RO Membrane Cleaning System (2006–2009)	$ 10.50	8.80
Martin	Martin County Utilities	Reclaimed	Tropical Farms and North	WWTF Expansion Projects (2006–2008)	$ 2.41	7.68
Martin	South Martin Regional Utility	Reclaimed	SMRU	WWTF Irrigation Quality Water Improvement Program Phases (2006–2009)	$ 2.53	1.40
St. Lucie	Fort Pierce Utilities Authority	Brackish	Henry Gahn	Floridan Aquifer Wells and WTF Expansion (2006–2008)	$ 4.70	4.30
St. Lucie	City of Port St. Lucie Utility Systems Department	Brackish	James E. Anderson (JEA)	Completed Brackish Projects (2006–2008)	$ 27.20	33.65
St. Lucie	City of Port St. Lucie Utility Systems Department	Reclaimed	Glades and Westport	Reclaimed Projects including Glades and Westport WWTF Expansions and Veranda Planned Unit Development Irrigation Quality (PUD IQ) Mains Master Irrigation (2006–2009)	$ 8.70	14.35

D

Potable and Wastewater Treatment Facilities

POTABLE WATER TREATMENT FACILITIES

Potable water used in the Upper East Coast (UEC) Planning Area is produced by large water treatment facilities, some smaller "package" water treatment facilities, and self-supply (i.e., private wells supplying individual users). This appendix focuses on large facilities with average pumpages equal to or greater than 100,000 gallons per day (GPD) – or 0.1 million gallons per day (MGD).

Descriptions of Existing Water Facilities

Raw water withdrawal sources in the UEC Planning Area include water from the surficial aquifer system (SAS) and Floridan aquifer system (FAS). **Table D-1** presents summary descriptions for each of the potable water treatment facilities located in the UEC Planning Area. The table contains the name of the supply entity, the South Florida Water Management District's (SFWMD or District) permit number and the annual water allocation of the permit in million gallons per day (MGD), the raw water withdrawal source, and the Florida Department of Environmental Protection's (FDEP) permit number and rated (design) capacity. **Figure D-1** and **Figure D-2** show the locations of potable water treatment facilities in Martin County and St. Lucie County, respectively.

Additional information about each Public Water Supply utility is available from http://www.sfwmd.gov under consumptive water use permits.

Table D-1. Potable water treatment facilities in the UEC Planning Area.

Supply Entity	SFWMD		Withdrawal Sources		FDEP	
	Permit Number	Annual Allocation (MGD)	Surficial Aquifer System (MGD)	Floridan Aquifer System (MGD)	Permit Number	Rated Capacity (MGD)
Martin County						
Indiantown Company	43-00041-W	1.17	1.17		4430667	1.30
Martin Correctional Institution	43-00277-W	0.29	0.29		4434406	0.43
Martin County Utilities – North Jensen	43-00102-W	8.82	2.68	6.14	4431891	22.93
Martin County Utilities – Vista Salerno	43-00089-W	0.33	0.33		4431891	See North Jensen
Martin County Utilities – Tropical Farms	43-00752-W	1.61	1.61		4431891	See North Jensen
Martin County Utilities – Tropical Farms	43-01724-W	11.52		11.52	4431891	See North Jensen
Martin County Utilities – Martin Downs	43-00169-W	[b]1.07	1.07		4431891	See North Jensen
Piper's Landing	43-00173-W	0.08	0.08		4434008	0.20
Sailfish Point	43-00146-W	0.22		0.22	4434000	0.35
South Martin Regional Utility	43-00066-W	5.47	4.84	0.63	4430624	8.14
Stuart, City of	43-00053-W	3.67	3.67		4430259	6.00
St. Lucie County						
Fort Pierce Utilities Authority	56-00085-W	21.13	8.00	13.13	4560490	19.00
Harbour Ridge	56-00449-W	0.13	0.13		4565002	0.36
Panther Woods Master Association	56-00462-W	0.12	0.12		4564397	0.43
Port St. Lucie Utility Systems Department, City of – Prineville & JEA	56-00142-W	51.38	5.00	46.38	4560954	41.65
Reserve Community Development District	56-00552-W	0.17	0.17		4565030	0.41
Spanish Lakes Fairways	56-00627-W	0.38	0.38		4565043	0.57
Spanish Lakes Country Club Village	56-00401-W	0.31	0.31		4564006	0.63
St. Lucie County Utilities – Holiday Pines[a]	56-00406-W	6.82	0.17	6.65	4561689	0.29
St. Lucie West Services District	56-00614-W	2.33		2.33	4565031	3.40

Note: All information taken from SFWMD consumptive use permits and FDEP permit design capacity in August 2010.

a. There is a limit of 0.167 MGD on surficial aquifer sytem withdrawals; the Floridan wells listed are proposed.

b. The current permit application is being reviewed by SFWMD staff.

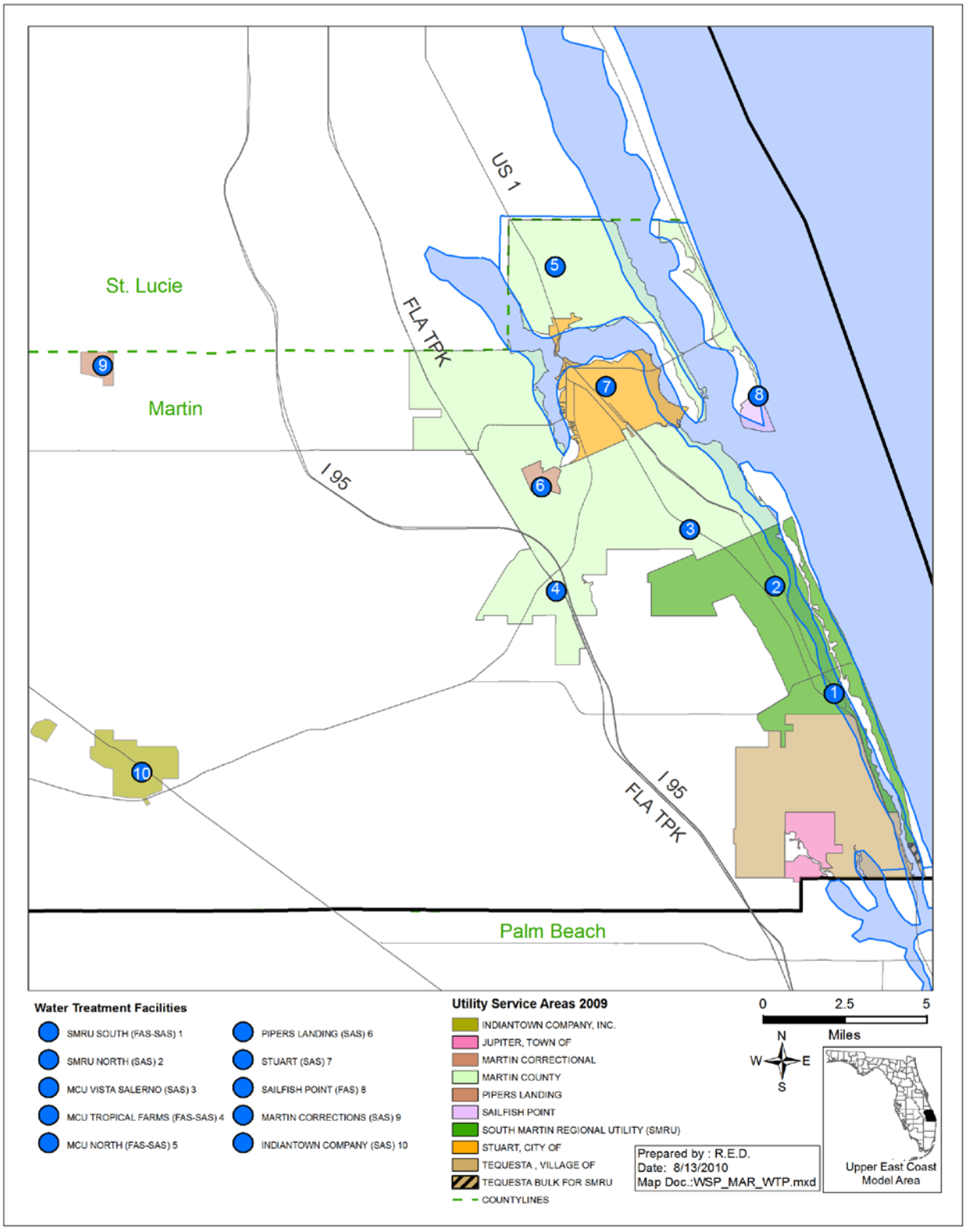

Figure D-1. Potable water treatment facilities in Martin County.

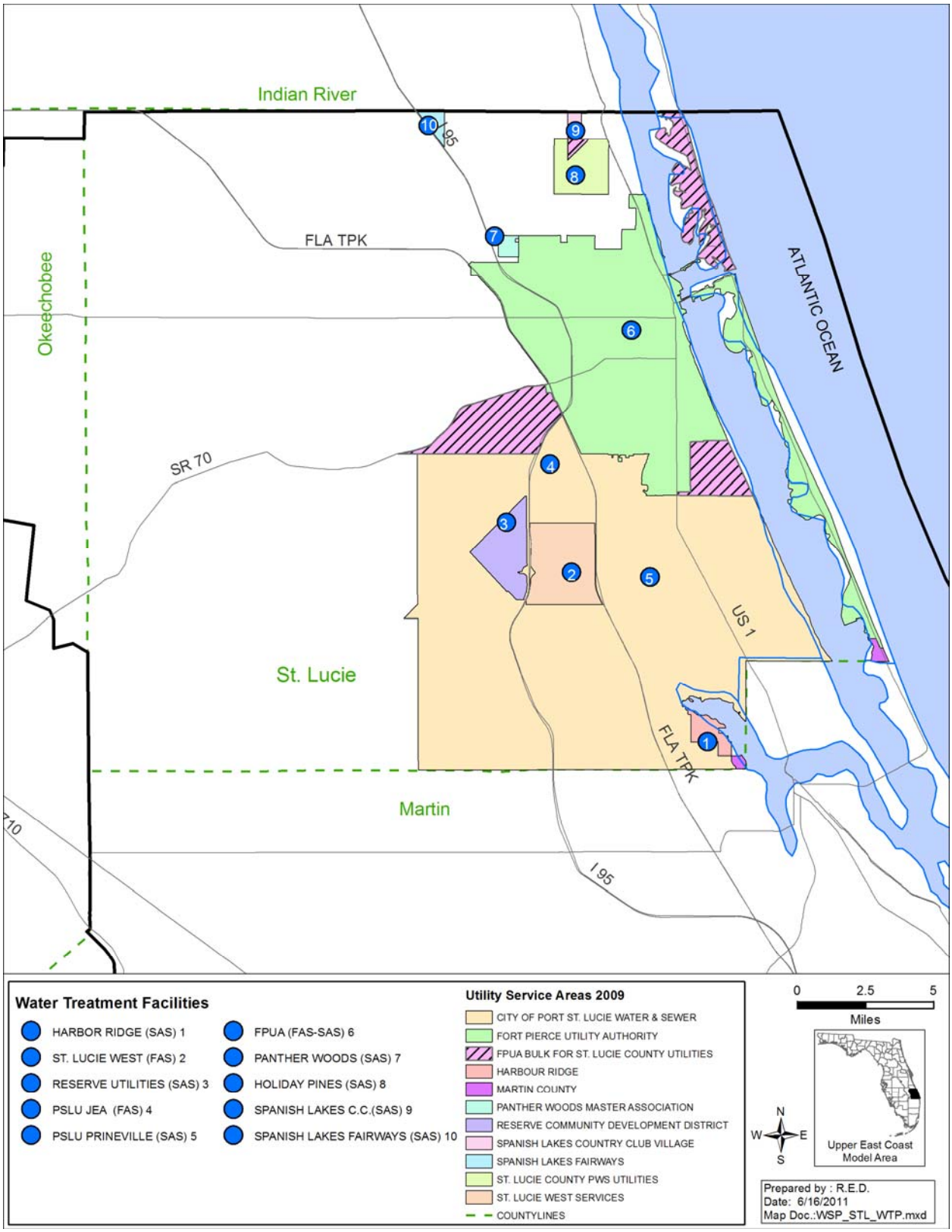

Figure D-2. Potable water treatment facilities in St. Lucie County.

WASTEWATER TREATMENT FACILITIES

Wastewater treatment is accomplished through regional wastewater treatment facilities (WWTFs), smaller "package plants," and septic tanks. The focus of this appendix is on the larger system facilities within the region because they allow economy of operation, and have sufficient flows that could positively impact water resources through reuse and support for a regional reuse program. Many facilities are located in areas close to potential reclaimed-water users. In addition, some of the facilities use distribution pipelines to serve their reclaimed water customers.

As of 2008, there were 25 wastewater treatment facilities with a capacity of 0.1 MGD each or greater in the UEC Planning Area. According to the FDEP, 23 of the 25 WWTFs reuse at least part of their wastewater (FDEP 2009). **Table D-2** lists the UEC Planning Area's 25 wastewater treatment facilities; **Figure D-3** and **Figure D-4** show each facility location. Tabular data are provided at the end of this appendix. **Table D-3**, **Table D-4**, and **Table D-5** summarize the past, present, and future wastewater/reuse flows for the facilities profiled in this appendix. **Table D-3** presents reuse percentages, along with the wastewater and reuse flows. **Table D-4** and **Table D-5** show the flows for the different reuse types for each of the facilities. **Table D-6** and **Table D-7** present flows for the various disposal options.

Although the regionwide capacity of the wastewater treatment facilities in the UEC Planning Area totals 44.4 MGD, an average of 23.4 MGD of wastewater was treated in 2008. Regionally, 9.8 MGD (42 percent) of treated wastewater was reused. The majority of the 9.8 MGD of treated wastewater supply was used for public access irrigation, which includes irrigation of golf courses, parks, schools, and residences. While public access irrigation accounted for 7.9 MGD of the 9.8 MGD, groundwater recharge through percolation ponds used 1.1 MGD, and other miscellaneous uses, such as agriculture and industrial, used 0.8 MGD. Treated effluent not reused was disposed of through deep well injection (12.4 MGD) or discharged to the ocean (0.06 MGD).

By 2030, wastewater utilities project flows will increase by 70–200 percent in the UEC Planning Area. Similarly, utilities estimate water reuse will increase to approximately 70 MGD by 2030. The significant increase in projected water reuse may be attributed to greater use of supplemental sources of water (e.g., Aquifer Storage and Recovery) and the addition of large-capacity users, such as the power plant in St. Lucie County.

Because supplemental reuse sources (groundwater or surface water) are used in some cases, reuse flow could exceed processed-wastewater flow at the treatment facility. If so, technically speaking the "reuse percentage" would be greater than 100 percent. In these cases, the reuse percentage is reported as 100 percent to avoid confusion. This is consistent with the manner in which reuse percentage is reported in the annual FDEP Reuse Inventories.

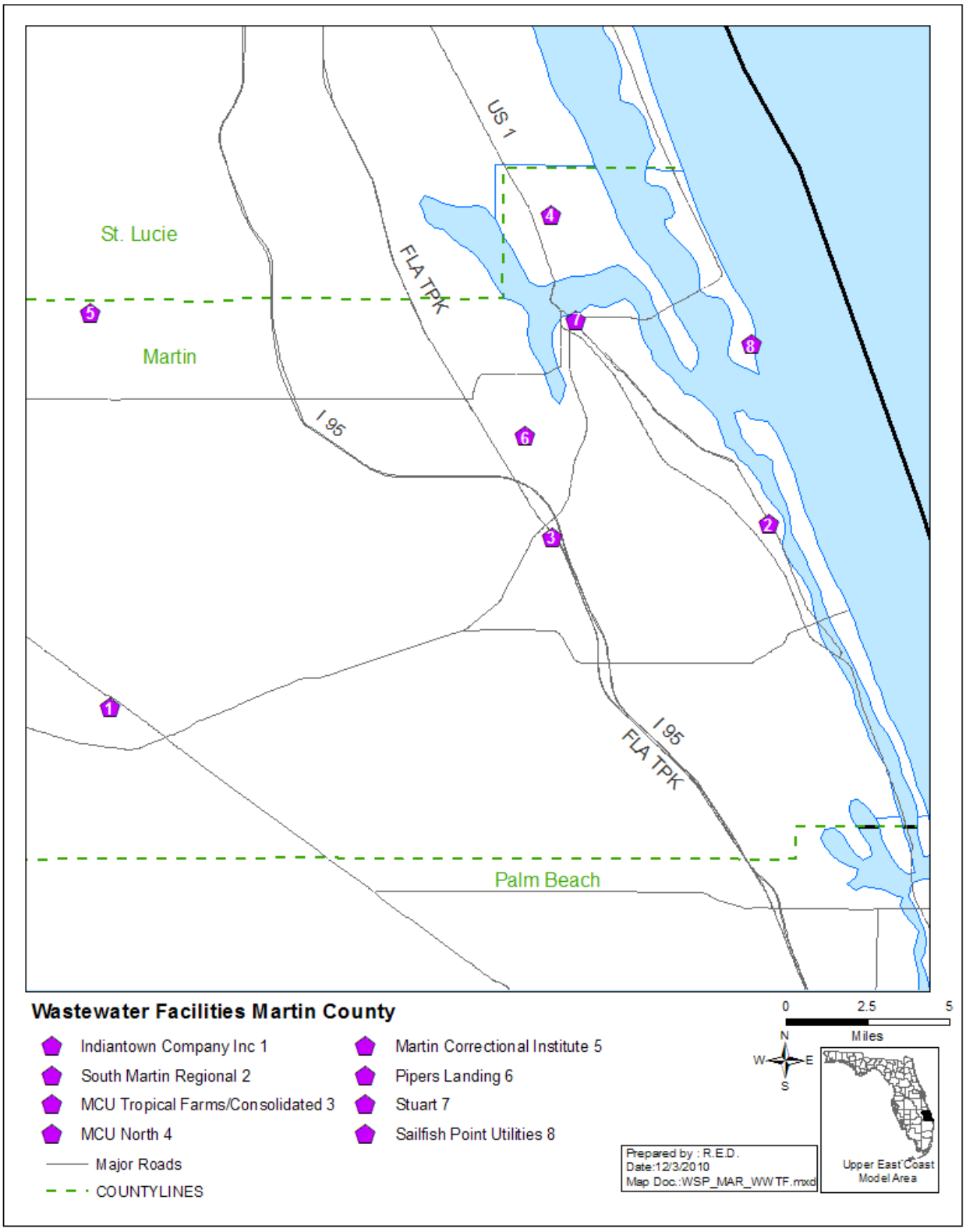

Figure D-3. Wastewater treatment facilities in Martin County.

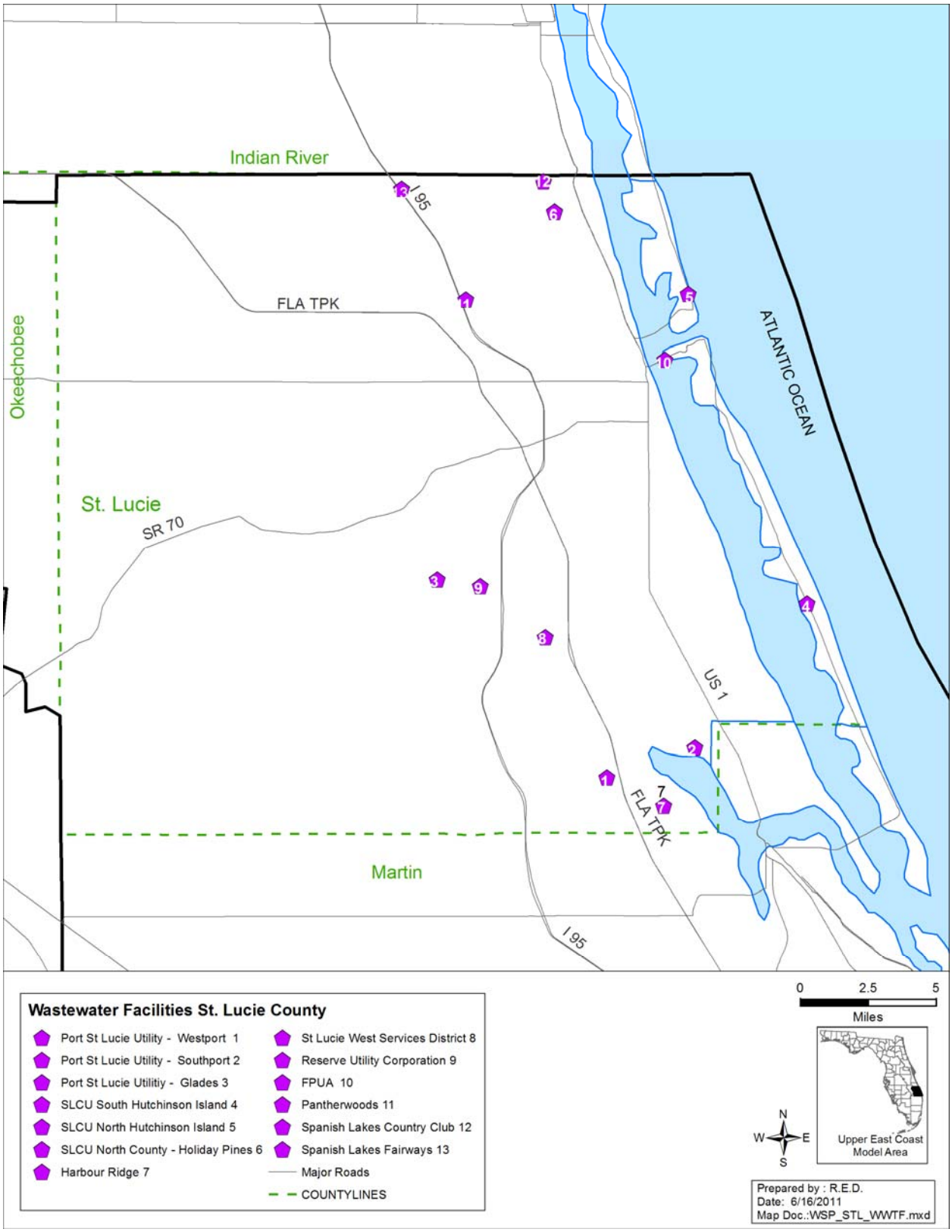

Figure D-4. Wastewater treatment facilities in St. Lucie County.

Profiles of Water Reuse Facilities

This appendix contains profiles of the larger wastewater utilities/facilities in the UEC Planning Area:

- Indiantown Company
- Martin County Utilities
- City of Stuart
- South Martin Regional Utilities
- Fort Pierce Utilities Authority
- Port St. Lucie Utilities
- St. Lucie County Utilities
- St. Lucie West Services District

The information provided in each profile was obtained from at least one of the following sources.

- *2008 Reuse Inventory* (2008 Reuse Inventory) (FDEP 2010)
- Communication with the utility
- Planning documents (e.g., 10-Year Water Supply Facility Work Plans)

The profiles are organized alphabetically by county, then by utility. Each profile contains the following information.

Treatment/Flows – This section presents FDEP-rated capacity, average daily flows (ADF) of wastewater and reclaimed water, and the method and flow of disposal, if applicable. Current capacity and flow information was gathered from the 2008 Reuse Inventory.

Reuse/Disposal – This section presents information about the types and flows of water reuse and disposal. A list of bulk end users, if available, is included.

Proposed/Future – This section provides a summary of any proposed/future plans for the facility, which may include increased capacities, flows, or reclaimed-water customers.

Martin County Wastewater Treatment Facilities

Indiantown

Treatment/Flows

Indiantown Company, Inc., owns and operates the Indiantown Wastewater Treatment Facility. This facility has a FDEP-rated capacity of 0.75 MGD and processed an average daily 0.52 MGD of wastewater in 2008.

Reuse/Disposal

Reclaimed water is used for rapid infiltration basins (RIB), agricultural irrigation, and as cooling water at the Indiantown Cogeneration Plant.

Proposed/Future

Future expansion of the Indiantown Company reuse system is dependent on the economic growth in the area. Wastewater flows are projected to increase to 1.25 MGD by 2030. The utility is planning to increase the capacity of the treatment facility to 1.50 MGD. Future reclaimed water users will likely be new residential developments. The timing of these new users and developments is currently unknown.

Information Sources

Indiantown Company and the 2008 Reuse Inventory (FDEP 2010)

Martin County Utilities – Leilani Heights (Decommissioned)

The Leilani Heights Wastewater Treatment Facility was decommissioned in 2006.

Information Source

Martin County Utilities

Martin County Utilities – Martin Downs (Decommissioned)

Treatment/Flows

The Martin Downs Wastewater Treatment Facility was taken out of service in 2009. Before it was retired, the facility had a FDEP-rated capacity of 1.75 MGD. The average daily reclaimed water flow from the facility was 1.34 MGD in 2008.

Reuse/Disposal

Before it was retired, the facility provided reclaimed water for golf course irrigation and to RIB. At the time of this 2011 UEC Plan Update, wastewater was being diverted to the Martin County Utilities – Tropical Farms treatment facility.

Proposed/Future

At the time of this 2011 UEC Plan Update, wastewater was being diverted to the Martin County Utilities – Tropical Farms treatment facility and reported by the county as part of the Martin County Consolidated Reuse System.

Information Sources

Martin County Utilities and 2005/2008 Reuse Inventories (FDEP 2006, 2010)

Martin County Utilities – Dixie Park (Decommissioned)

Treatment/Flows

The Martin County Utilities Dixie Park Wastewater Treatment Facility was taken out of service in 2008. Before it was decommissioned, it had a FDEP-rated capacity of 1.50 MGD. The average daily flow from the facility was 1.02 MGD, according to the 2005 Reuse Inventory (FDEP 2006).

Reuse/Disposal

Before it was decommissioned, the facility provided reclaimed water to three local golf courses.

Proposed/Future

At the time of this 2011 UEC Plan Update, wastewater was being diverted to the Martin County Utilities – Tropical Farms treatment facility and reported by the County as part of the Martin County Consolidated Reuse System.

Information Sources

Martin County Utilities and 2005 Reuse Inventory

Martin County Utilities – North County

Treatment/Flows

The North County Wastewater Treatment Facility has a FDEP-rated capacity of 2.76 MGD. The 2008 average daily wastewater flow processed was 1.12 MGD.

Reuse/Disposal

Reclaimed water is provided for irrigation and water to various end users, such as those in the following list. A daily average of 0.61 MGD was reused, with the remaining treated water being disposed of using deep well injection (0.51 MGD).

End User	Reuse Type
West Jensen/Eagle Marsh Land Co.	Golf Course & Residential Irrigation
Pines and Windemere	Residential Irrigation
Pineapple Cove	Residential Irrigation
Jensen Beach High School	School Irrigation
Goldenrod Road	Public Access Area Irrigation
Pineapple Commons	Public Access Area Irrigation
CVS/Pharmacy	Public Access Area Irrigation
Pineapple Park	Public Access Area Irrigation

Future/Proposed

Wastewater flows to the North County facility are expected to increase to 1.55 MGD by 2030. The capacity of the facility is not expected to increase more than the current 2.76 MGD. It is expected that the amount of water reused from the facility will increase as flows increase and additional reuse customers are identified.

Information Sources

Martin County Utilities and 2008 Reuse Inventory

Martin County Utilities – Tropical Farms/Consolidated

Treatment/Flows

The Tropical Farms Wastewater Treatment Facility has a FDEP-rated capacity of 5.00 MGD. The 2008 average daily wastewater flow processed was 2.05 MGD, with 2.13 MGD being reused. The reuse flow exceeded the wastewater flow due to a supplemental source of concentrate from the reverse osmosis water treatment facility at the site. By the time of the 2008 Reuse Inventory, treated wastewater flows from the Tropical Farms facility were reported within with the Martin County Consolidated Reuse System.

Reuse/Disposal

In 2008, treated wastewater was reused through RIB and irrigation provided to more than 200 residences, seven golf courses, and one park. Disposal of treated wastewater into a deep injection well averaged 0.33 MGD in 2008. Reclaimed water is provided (or is planned to be provided) to:

End User	Reuse Type
Heritage Ridge	Golf Course Irrigation
Lost Lake	Golf Course Irrigation
Martin Downs – Tower	Golf Course Irrigation
Crane Creek	Golf Course Irrigation
Florida Club	Golf Course Irrigation
Mariner Sands	Golf Course Irrigation
Willoughby	Golf Course Irrigation
Halpatiokee Park	Park Irrigation
Martin's Crossing	Residential Irrigation
Sand Trail (Copperleaf)	Residential Irrigation
Port Salerno	Percolation Ponds (5)

Future/Proposal

Wastewater flows to the Tropical Farms facility are expected to increase to 4.91 MGD by 2030. The FDEP-rated capacity of the facility is expected to increase to 7.50 MGD. The expansion is forecasted for 2018. In the interim, Martin County has entered into an agreement with the City of Stuart allowing the county to send wastewater to the city's wastewater facility. The agreement states that the City of Stuart will reserve an annual average daily capacity of 0.015 MGD in 2010, gradually increasing capacity to 0.84 MGD by 2027.

Information Sources

Martin County Utilities and 2008 Reuse Inventory

South Martin Regional Utility (SMRU)

Treatment/Flows

The South Martin Regional Utility Water Reclamation Facility has a FDEP-rated capacity of 1.40 MGD. The 2008 average daily wastewater and reuse flow was 0.79 MGD. The treated wastewater is 100 percent reused.

Reuse/Disposal

The 0.79 MGD (annual average daily flow) of reclaimed water is reused for the following:

- Golf Course Irrigation – 0.68 MGD
- Other Public Irrigation – 0.07 MGD
- Rapid Infiltration Basins – 0.02 MGD
- Residential Irrigation – 0.01 MGD
- At the Wastewater Treatment Facility – 0.01 MGD

The majority of reclaimed water use is for golf course irrigation. End users receiving the reclaimed water include:

End User	Reuse Type
Loblolly Pines	Golf Course
McArthur Golf Club	Golf Course
The Medalist	Golf Course
Eaglewood	Golf Course
Pine School	School
Shellbridge	Apartments/Condos
Tranquility	Apartments/Condos
Bridgetown	Apartments/Condos

Proposed/Future

Wastewater flows to the SMRU facility are expected to increase to 1.10 MGD by 2030. The capacity of the facility is expected to remain at 1.40 MGD. The reuse system is expected to expand as wastewater flows increase, with the intention to reuse all wastewater treated at this facility via public access irrigation. The utility is also considering the increased use of supplemental water to increase the volume and reliability of the reclaimed water system.

Information Sources

South Martin Regional Utility and 2008 Reuse Inventory

City of Stuart – Wastewater Treatment Facility

Treatment/Flows

The City of Stuart Wastewater Treatment Facility has a FDEP-rated capacity of 4.00 MGD. Wastewater flow to the facility averaged 1.69 MGD per day in 2008. The city has an inter-local agreement with Martin County to reserve treatment capacity of their facility for wastewater flows from the county. The agreement states that the city will reserve an annual average daily capacity of 0.015 MGD in 2010, gradually increasing to 0.84 MGD by 2027.

Reuse/Disposal

In 2008, no wastewater was reused at the City of Stuart facility. Disposal of all treated wastewater (1.69 MGD in 2008) was through deep well injection. The city recently completed construction of a 1.33 MGD filtration and high-level disinfection treatment system and is installing a reclaimed water transmission main (Martin County Interconnect and Sailfish Park) and metering stations. This project is partially funded by the SFWMD's Fiscal Year (FY) 2011 Alternative Water Supply Funding Program. Once complete, this project will have the ability to deliver 2.3 MGD of reclaimed water on a daily basis.

Proposed/Future

The treatment capacity of the City of Stuart facility is not expected to increase over the current capacity (4.00 MGD) in the next 20 years. As previously mentioned, the city has agreed to reserve a portion of their treatment capacity for wastewater from Martin County. Wastewater flows are expected to increase to 3.60 MGD by 2027. Although the city does not currently reuse water, it is proposed that the city will reuse 2.60 MGD for public access irrigation by 2027. The city expects to continue use of the deep injection well for excess flows at an expected rate of 1.00 MGD by 2027.

Information Sources

City of Stuart and 2008 Reuse Inventory

St. Lucie County Wastewater Treatment Facilities

Fort Pierce Utilities Authority – Island

Treatment/Flows

The Fort Pierce Utilities Authority (FPUA) Island Water Reclamation Facility has a FDEP-rated capacity of 10.00 MGD and had an average 5.84 MGD of wastewater flow per day in 2008.

Reuse/Disposal

In 2008, 0.30 MGD of treated wastewater flow was reused for onsite processes and irrigation, with disposal of the remaining flow through deep well injection.

Proposed/Future

Plans to retire the Island Water Reclamation Facility in 2018 coincide with construction of the FPUA's Mainland Water Reclamation Facility (MWRF). The MWRF is planned for full water reuse.

Information Sources

Fort Pierce Utilities Authority, the *City of Fort Pierce 2010 Evaluation and Appraisal Report* (City of Fort Pierce 2010), and 2008 Reuse Inventory

Fort Pierce Utilities Authority – Mainland (Proposed)

Proposed/Future

The Mainland Water Reclamation Facility (MWRF) is planned for full water reuse. The Treasure Coast Energy Center (TCEC) is under agreement to use 2.90 MGD of reclaimed water for cooling at TCEC Unit 1. The MWRF may ultimately supply up to 11.60 MGD for TCEC Units 2, 3, and 4. By 2030, the MWRF is planned to become a 20-MGD facility with reuse water supplied to the TCEC, an additional 5.40 MGD to parks and golf courses, and approximately 3.00 MGD for other uses, such as agriculture.

Information Source

Fort Pierce Utilities Authority

City of Port St. Lucie – Northport (Decommissioned)

Treatment/Flows

The Northport Wastewater Treatment Facility was taken out of service in 2007. Before it was retired, the facility had a FDEP-rated capacity of 1.50 MGD with no reuse. Wastewater was being diverted to the Glades treatment facility at the time of the 2008 Reuse Inventory.

Information Sources

2008 Reuse Inventory

City of Port St. Lucie – Glades

Treatment/Flows

The Glades Wastewater Treatment Facility began operations in 2007 and has a FDEP-rated capacity of 5.75 MGD. The facility received average daily flows of 3.58 MGD in 2008, which includes wastewater flows from the retired Northport facility that are being diverted to the Glades facility.

Reuse/Disposal

This facility has the ability to provide 5.75 MGD of reclaimed water for public access irrigation; however, it is not yet sending reclaimed water to end users. All of the annual average flow of treated wastewater is currently being disposed of through deep well injection.

Proposed/Future

Reuse flow at the Glades facility is projected to increase to 21.68 MGD by 2030. Wastewater flow is expected to increase to 16.50 MGD. Reuse flows are expected to increase with increased wastewater flow and there are plans to include the use of Aquifer Storage and Recovery (ASR). Use of ASR is expected to enable the utility to balance the supply and demands of reclaimed water throughout the year.

The potential end users of reclaimed water include:

Potential End User	Projected Flows (MGD)
Enchantment Village	0.48
Graves Bros	0.37
Kenco/West Creek	0.55
North Pointe	2.60
Copper Creek	0.38
Verano	2.00
Tradition/Southern Grove	6.00
Tropicana	0.30
St Lucie West	6.00
Wilson/Kennedy/Riverland	3.00

Information Sources

City of Port St. Lucie 10-Year Water Supply Facility Work Plan (City of Port St. Lucie 2007) and 2008 Reuse Inventory

City of Port St. Lucie – Southport

Treatment/Flows

The Southport Wastewater Treatment Facility has a FDEP-rated capacity of 2.20 MGD. The 2008 average daily wastewater flow to the facility was 2.02 MGD. The amount of water reclaimed from the facility averaged 0.44 MGD.

Reuse/Disposal

Reclaimed water is used for irrigation of residences and a golf course. Approximately 500 homes received an average of 0.20 MGD of reclaimed water; the Ballantrae Golf Course received 0.24 MGD in 2008. The remaining 1.56 MGD of treated wastewater was disposed of through deep well injection.

Proposed/Future

The Southport facility is anticipated to be taken out of service in 2012. Wastewater flows will be diverted to the Westport facility, which will deliver reclaimed water to existing Southport customers.

Information Sources

City of Port St. Lucie and 2008 Reuse Inventory

City of Port St. Lucie – Westport

Treatment/Flows

The Westport Wastewater Treatment Facility has a FDEP-rated capacity 3.93 MGD. The 2008 average daily wastewater flow to the facility was 1.71 MGD. The amount of water reclaimed from the facility averaged 0.61 MGD. The City of Port St. Lucie proposes to take the Southport facility out of service in 2012, at which time flows will be diverted to the Westport facility.

Reuse/Disposal

In 2008, reclaimed water from the Westport facility was reused for irrigation of the Tesoro golf course, which received an average of 0.61 MGD of reclaimed water. The remaining 1.11 MGD was disposed of through deep well injection.

Proposed/Future

The FDEP-rated capacity of the Westport facility is planned to increase to 12.00 MGD by 2030. Reuse flow is projected to increase to 12.53 MGD with the use of supplemental water via ASR. The potential end users of reclaimed water from this facility are:

Potential End User	Projected MGD (2030)
Tesoro	3.68
Ballantrae	2.30
Saints Golf Course	1.00
Veranda Planned Unit Development (PUD)	0.80
Veranda PUD	0.75
Veranda PUD	1.10
Botanical Garden	0.10
Morningside Median	0.10
Westmoreland Median	0.10
Veterans Park	0.05
Lyngate Park	0.25
Club Med	1.00
Harbor Ridge	1.00
Sawgrass	0.30

Information Sources

City of Port St. Lucie 10-Year Water Supply Facility Work Plan and 2008 Reuse Inventory

St. Lucie County Utilities Department – North (Holiday Pines)

Treatment/Flows

The North (Holiday Pines) Wastewater Treatment Facility has a FDEP-rated capacity of 0.30 MGD. The 2008 annual average daily wastewater flow to the facility was 0.09 MGD.

St. Lucie County has an existing bulk service agreement with the Fort Pierce Utilities Authority in which wastewater flows from a portion of the St. Lucie County Utilities northern service area are sent to the FPUA Water Reclamation Facility for treatment.

Reuse/Disposal

Based on 2008 data, all flow was reused. An average daily reclaimed water flow of 0.09 MGD was sent to a RIB (percolation ponds) at the facility. Reverse osmosis concentrate from treatment of surficial aquifer system groundwater is also sent to the percolation ponds.

Proposed/Future

The county purchased a parcel of land northwest of the airport with the intention of co-locating a regional water treatment facility and wastewater treatment facility. If built, wastewater flows from Holiday Pines would be redirected to the North County Regional Wastewater Treatment Facility and the Holiday Pines Facility decommissioned. The 2030 capacity of the North regional facility is expected to be 6.00 MGD, with wastewater flows of 4.80 MGD. Water reuse opportunities at the regional facility are yet to be determined.

Information Sources

St. Lucie County Utilities, *St. Lucie County 10-Year Water Supply Facilities Work Plan*, and 2008 Reuse Inventory

St. Lucie County Utilities Department – North Hutchinson Island

Treatment/Flows

The North Hutchinson Island facility has a FDEP-rated capacity of 0.50 MGD. The 2008 annual average daily wastewater flow to the facility was 0.23 MGD. All wastewater flow is treated to reuse standards.

Reuse/Disposal

According to 2008 data, all flow was reused for multi-family common area irrigation.

Proposed/Future

St. Lucie County Utilities has preliminary plans for expansion of the North Hutchinson Island facility from 0.50 MGD to 0.80 MGD to accommodate future development.

Current End User	Future End User
Altamira I & II	Avalon Beach
Aquanique	Grande Beach
Atlantic View Beach Club	Ocean Estate
Atrium I	Ocean Palms
Atrium II	Paradiso
Avalon Beach Park	Round Island
Breakers	Queens Preserve
Grande Isle	Seaside
Harbour Cove	
Hibiscus	
Greenwood Development (aka Meridian)	
Ocean Harbor North	
Ocean Harbor Villas	
Ocean Pearl	
Ocean Real Estate	
Ocean Resorts	
Oceanique	
Sands Condo	
Sea Palms	
Treasure Cove Dunes	
Visions	

Information Sources

St. Lucie County Utilities, St. Lucie County 10-Year Water Supply Facilities Work Plan (St. Lucie County 2008), and 2008 Reuse Inventory

St. Lucie County Utilities Department – South Hutchinson Island

Treatment/Flows

The South Hutchinson Island Wastewater Treatment Facility has a FDEP-rated capacity of 1.60 MGD. The 2008 annual average daily wastewater flow to the facility was 0.48 MGD.

Reuse/Disposal

Reclaimed water is used for landscape and multi-family common area irrigation. The water reused from the facility averaged 0.33 MGD, while effluent disposal averaged 0.06 MGD through the Florida Power & Light ocean outfall canal just north of the facility.

Proposed/Future

The St. Lucie County Utilities South Hutchinson Island Water Reclamation Facility was designed and constructed for build-out of the St. Lucie County Utilities South Hutchinson Island service area. The treatment capacity of the South Hutchinson Island Water Reclamation Facility is not expected to increase by 2030. Wastewater flows to the facility in 2030 are expected to be 1.30 MGD.

Information Sources

St. Lucie County Utilities, St. Lucie County 10-Year Water Supply Facilities Work Plan, and 2008 Reuse Inventory

St. Lucie County Utilities Department – North County Regional (Proposed)

Proposed/Future

St. Lucie County purchased a parcel of land northwest of the airport with the intention of co-locating a regional water treatment facility and wastewater treatment facility. The proposed North County Regional Wastewater Treatment Facility would be built with an initial capacity of 2.00 MGD to 4.00 MGD, depending on development in the area. The North County Regional facility would be a 100-percent reclaimed water facility, with wet weather disposal of excess flows through deep well injection or other suitable alternatives as needed. The facility would also treat redirected wastewater from the North (Holiday Pines) and other small facilities, which are planned to be decommissioned once the regional facility is online.

Information Source

St. Lucie County 10-Year Water Supply Facilities Work Plan

St. Lucie County Utilities Department – Central and South County Regional (Proposed)

Proposed/Future

St. Lucie County is also considering Central County and South County regional wastewater treatment facilities. The Central County facility could be required during the next county 10-year planning horizon; however, plans for the South County facility are preliminary, and therefore, not considered in the next 10-year planning horizon.

Information Source

St. Lucie County 10-Year Water Supply Facilities Work Plan

St. Lucie West Services District

Treatment/Flows

The St. Lucie West Services District Wastewater Treatment facility has a FDEP-rated treatment capacity of 2.00 MGD. The facility processed 1.20 MGD of wastewater for use as reclaimed water in 2008. Treated flows are discharged into a local stormwater lake, where the supplemental water is used for irrigation.

Reuse/Disposal

Reclaimed water is used to supplement irrigation for more than 5,000 residences, six schools, and one park. The total irrigation flow of reclaimed water is 2.67 MGD.

Proposed/Future

No facility expansion is expected through 2020. Treated wastewater is expected to increase from 1.20 MGD in 2008 to 1.66 MGD by 2020. As growth occurs, irrigation demands will likely increase using reclaimed water supplemented by storm water.

Information Sources

St. Lucie West Services District 2010 Capacity Assessment Report (CPH Engineers, Inc. 2010) and 2008 FDEP Inventory

Wastewater and Water Reuse Data

The tables on the following pages of this appendix provide information about wastewater and water reuse in the UEC Planning Area. The primary sources of information for these tables are the FDEP Reuse Inventories (FDEP 2006 and 2010). These inventories are compilations of wastewater and reuse information from around the state. The FDEP inventory information is based on fiscal year data from Annual Reuse Reports submitted to the FDEP by each wastewater utility. Secondary sources of information include planning documents, such as 10-Year Water Supply Facilities Work Plans.

In **Table D-2** and **Table D-3** it should be noted that the Reuse Percentage, denoted in the column heading of **Table D-3** as "Reuse (%)," is frequently used when describing reuse facilities. This percentage is intended to reflect the amount of water reused when compared with the amount of wastewater treated. In the annual FDEP Reuse Inventories, "Flow Ratio" is used, and is defined as "the Total Reuse Flow divided by the Total Wastewater Flow." The definition continues by clarifying "….Flow ratios greater than 1.0 (i.e., greater than 100%) indicate that reuse may include supplemental water supplies…" Any supplemental water supplies (e.g., groundwater or surface water) are included in the "Reuse Flows." If supplemental flows cause the Reuse Percentage to exceed 100 percent, the Reuse Percentage will show 100 percent.

Table D-2 lists all the wastewater treatment facilities in the UEC Planning Area with treatment capacity greater than or equal to 100,000 gallons per day (0.1 MGD). The 2008 wastewater and water reuse information for the 25 facilities in the region are presented. Many of the smaller wastewater facilities reuse all of their reclaimed water for irrigation of adjacent golf courses. The larger facilities are trending toward regionalization, where flows from smaller facilities are diverted to these regional treatment facilities. As a result, water reuse percentages at these regional facilities may decrease until reclaimed water distribution systems are established.

Table D-3 shows historical, current, and projected data, side-by-side, from the larger, profiled wastewater treatment facilities in the UEC Planning Area. The table shows a decrease in wastewater and water reuse flows in the region from 2005 to 2008, but a significant increase by 2030. Regionalization is evident by the recently constructed or proposed treatment facilities in Martin County, Port St. Lucie, and St. Lucie County. Fort Pierce Utilities Authority (FPUA) proposes to construct a larger inland facility and increase its water reuse significantly.

Table D-4 and **Table D-5** represent the types of water reuse practiced by the profiled facilities in Martin and St. Lucie counties. The tables show that public access irrigation (e.g., golf courses, parks, schools) has been, and will continue to be, the primary means of water reuse in the region. **Table D-6** and **Table D-7** provide the types of effluent disposal used by the profiled facilities in Martin and St. Lucie counties. Disposal is for reclaimed water/effluent that is not reused, and is used only as a backup to reuse. As shown, the primary means of disposal is through deep well injection. The amount of deep well injection in the region is not projected to increase by 2030.

Table D-2. Existing wastewater facilities in the UEC Planning Area.[a]

County/Facility	2008			
	FDEP Rated WWTF Capacity (MGD)	Average Daily WWTF Flow (MGD)	Average Daily Reuse Flow (MGD)	Reuse Percentage[b] (%)
Martin County				
Indiantown Company	0.75	0.52	0.52	100%
Martin Co. – Martin Downs[c]	1.75	1.33	--	--
Martin Co. – North County	2.76	1.12	0.61	54%
Martin Co. – Tropical Farms/Consolidated[c,d]	5.00	1.78	2.13	100%
South Martin Regional Utilities	1.40	0.79	0.79	100%
Indian River Plantation	0.30	0.13	0.13	100%
Martin Correctional Institution	0.60	0.17	0.17	100%
Miles Grant Condominiums	0.30	0.10	0.10	100%
Piper's Landing	0.10	0.07	0.07	100%
Sailfish Point	0.25	0.08	0.08	100%
Stuart, City of	4.00	1.69	0.00	0%
11 Facilities Sub-Total	**17.21**	**7.78**	**4.60**	**59%**
St. Lucie County				
FPUA – Island	10.00	5.84	0.30	5%
Port St. Lucie, City of – Glades	5.75	3.58	0.00	0%
Port St. Lucie, City of – Southport	2.20	2.02	0.44	22%
Port St. Lucie, City of – Westport	3.93	1.71	0.61	36%
St. Lucie County – North (Holiday Pines)	0.30	0.09	0.09	100%
St. Lucie County – North Hutchinson Island	0.50	0.23	0.23	100%
St. Lucie County – South Hutchinson Island	1.60	0.48	0.33	69%
St. Lucie West Services District	2.00	1.20	2.67	100%
Harbour Ridge	0.12	0.07	0.07	100%
Island Dunes	0.12	0.05	0.05	100%
Pantherwoods	0.11	0.06	0.06	100%
Savanna Club	0.15	0.06	0.06	100%
Spanish Lakes Country Club	0.16	0.13	0.13	100%
Spanish Lakes Fairways	0.25	0.14	0.14	100%
14 Facilities Sub-Total	**27.19**	**15.66**	**5.18**	**33%**
UEC Planning Area Total – 25 Facilities	**44.40**	**23.44**	**9.78**	**42%**

a. All wastewater facilities with a capacity of 0.1 MGD or greater as reported in the 2008 Reuse Inventory (FDEP 2010).

b. Reuse percentage is calculated by dividing "Reuse Flow" (including any supplemental flow) by "WWTF Flow."

c. The 2008 Reuse Inventory listed wastewater flows to the Martin Downs facility, but the reuse flows from the facility were reported within a consolidated system total. Martin Downs was taken out of service in 2009.

d. Reuse flow using supplemental sources may exceed flow; however, the reuse percentage reported is capped at 100 percent.

Table D-3. Profiled (featured larger system) facilities –

County/Facility	2005				
	FDEP Rated WWTF Capacity (MGD)	Average Daily WWTF Flow (MGD)	Average Daily Reuse Flow (MGD)	Supple-mental Flow (MGD)	Reuse (%)[h]
Martin County					
Indiantown	0.75	0.41	0.41	0.00	100%
Martin Co. – Leilani Heights[a]	0.15	0.06	0.06	0.00	100%
Martin Co. – Martin Downs[b]	1.75	0.43	0.69	0.26	100%
Martin Co. – Dixie Park[a]	1.50	0.81	0.81	0.00	100%
Martin Co. – North County	1.38	1.13	0.64	0.00	57%
Martin Co. – Tropical Farms/Consolidated[c]	0.75	0.75	0.75	0.00	100%
South Martin Regional Utilities	1.20	0.77	0.77	0.00	100%
Stuart, City of	4.00	1.79	0.00	0.00	0%
Martin County Sub-Total	**11.48**	**6.15**	**4.13**	**0.26**	**67%**
St. Lucie County					
FPUA – Island[d]	10.00	6.51	0.38	0.00	6%
FPUA – Mainland[d]	--	--	--	--	--
Port St. Lucie – Northport[e]	1.50	0.99	0.00	0.00	0%
Port St. Lucie, City of – Glades[e]	--	--	--	--	--
Port St. Lucie, City of – Southport[e]	2.80	2.28	0.49	0.00	21%
Port St. Lucie, City of – Westport	--	--	--	--	--
St. Lucie Co. – North (Holiday Pines)[f]	0.18	0.10	0.10	0.00	100%
St. Lucie Co. – North Hutchinson Island	0.50	0.25	0.25	0.00	100%
St. Lucie Co. – South Hutchinson Island	1.60	0.44	0.32	0.00	73%
St. Lucie Co. – North County Regional[f]	--	--	--	--	--
St. Lucie Co. – Central County Regional[f]	--	--	--	--	--
St. Lucie Co. – South County Regional[f]	--	--	--	--	--
St. Lucie West	2.00	1.20	2.35	1.15	100%
St. Lucie County Sub-Total	**18.58**	**11.77**	**3.89**	**1.15**	**33%**
UEC Planning Area Total	**30.06**	**17.92**	**8.02**	**1.41**	**45%**

a. The Leilani Heights and Dixie Park facilities were taken out of service in 2006 and 2008, respectively.
b. The Martin Downs facility was reported in the 2008 Reuse Inventory, with individual wastewater flows in Appendix B, but part of a consolidated system total for reuse flows in Appendix D.
c. Reuse flows include those from the Martin Downs and Dixie facilities, which were decommissioned in 2009 and 2008, respectively.
d. The FPUA Island facility is planned to be taken out of service in 2018 when the Mainland facility comes online.
e. The Port St. Lucie Northport facility was taken out of service in 2007. The Port St. Lucie Glades facility began operation in 2007. The Port St. Lucie Southport facility is planned to be taken out of service in 2012.
f. St. Lucie County intends to construct a North County Regional facility and divert flows from Holiday Pines and other smaller facilities. These regional St. Lucie County facilities are included in future plans, but no projected numbers were provided to the SFWMD by the utility.
g. Reuse flow is supplemented using Aquifer Storage and Recovery wells.
h. Reuse flow using supplemental sources may exceed flow; however, the reuse percentage is reported as capped at 100 percent.
i. Reuse flow is supplemented by surface water from lakes.

wastewater/reclaimed flows and reuse percentage.

2008					2030				
FDEP Rated WWTF Capacity (MGD)	**Average Daily WWTF Flow (MGD)**	**Average Daily Reuse Flow (MGD)**	**Supple-mental Flow (MGD)**	**Reuse (%)[h]**	**WWTF Capacity (MGD)**	**Average Daily WWTF Flow (MGD)**	**Average Daily Reuse Flow (MGD)**	**Supple-mental Flow (MGD)**	**Reuse (%)[h]**
0.75	0.52	0.52	0.00	100%	1.50	1.25	1.25	0.00	100%
--	--	--	--	--	--	--	--	--	--
1.75	1.33	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--
2.76	1.12	0.61	0.00	54%	2.76	1.55	1.08	0.0	70%
5.00	2.05	[h]2.13	0.35	100%	7.50	4.91	3.43	0.0	70%
1.40	0.79	0.79	0.00	100%	1.40	1.10	1.10	0.0	100%
4.00	1.69	0.00	0.00	0%	4.00	3.60	2.60	0.0	72%
15.66	**7.50**	**4.05**	**0.35**	**56%**	**17.16**	**12.41**	**9.46**	**0.00**	**76%**
10.00	5.84	0.30	0.00	5%	--	--	--	--	--
--	--	--	--	--	20.00	20.00	20.00	0.00	100%
--	--	--	--	--	--	--	--	--	--
5.75	3.58	0.00	0.00	0%	24.00	16.50	21.68	[g]5.18	100%
2.20	2.02	0.44	0.00	22%	--	--	--	--	--
3.93	1.71	0.61	0.00	36%	12.00	9.80	12.53	[g]2.73	100%
0.30	0.09	0.09	0.00	100%	--	--	--	--	--
0.50	0.23	0.23	0.00	100%	0.80	0.65	0.52	0.00	80%
1.60	0.48	0.33	0.00	69%	1.60	1.30	1.04	0.00	80%
--	--	--	--	--	6.00	4.80	3.84	0.00	80%
--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--
2.00	1.20	2.67	1.47	100%	2.00	1.66	1.66	[i]1.84	100%
26.28	**15.15**	**4.67**	**1.47**	**31%**	**66.40**	**54.71**	**61.27**	**9.75**	**100%**
41.94	**22.65**	**8.72**	**1.82**	**39%**	**83.56**	**67.12**	**70.73**	**9.75**	**100%**

Table D-4. Profiled (featured larger system) facilities – reuse types in Martin County.

County/Facility	2005			2008			2030		
	Public Access Irrigation[a] (MGD)	Groundwater Recharge[b] (MGD)	Other[c] (MGD)	Public Access Irrigation[a] (MGD)	Groundwater Recharge[b] (MGD)	Other[c] (MGD)	Public Access Irrigation[a] (MGD)	Groundwater Recharge[b] (MGD)	Other[c] (MGD)
Martin County									
Indiantown	0.00	0.30	0.11	0.00	0.21	0.31	0.25	0.25	0.75
Martin Co. – Leilani Heights[d]	0.00	0.06	0.00	--	--	--	--	--	--
Martin Co. – Martin Downs[e]	0.53	0.16	0.00	--	--	--	--	--	--
Martin Co. – Dixie Park[f]	0.81	0.00	0.00	--	--	--	--	--	--
Martin Co. – North County	0.64	0.00	0.00	0.61	0.00	0.00	1.38	0.00	0.00
Martin Co. – Tropical Farms/ Consolidated	0.75	0.00	0.00	1.57	0.56	0.00	2.83	0.00	0.00
South Martin Regional Utilities	0.77	0.00	0.00	0.76	0.00	0.00	1.10	0.00	0.00
Stuart, City of	0.00	0.00	0.00	0.00	0.00	0.00	2.60	0.00	0.00
Martin County Total	**3.50**	**0.52**	**0.11**	**2.94**	**0.77**	**0.31**	**8.16**	**0.25**	**0.75**
UEC Planning Area Total	**6.89**	**0.62**	**0.52**	**7.22**	**0.86**	**0.61**	**56.95**	**28.89**	**12.35**

a. Golf courses, residential, parks, common areas, and other public access areas.

b. Through rapid infiltration basins (RIB), percolation ponds, shallow injection wells, and ASR wells.

c. Agriculture, wetlands, cooling water, treatment processes, toilet flushing, etc.

d. The Leilani Heights facility was taken out of service in 2006.

e. The Martin Downs facility was reported in the 2008 Reuse Inventory, with individual wastewater flows (Appendix B), but was part of a consolidated system total for reuse flows (Appendix D). The facility was later taken out of service (2009).

f. The Dixie Park facility was taken out of service in 2008.

Table D-5. Profiled (featured larger system) facilities – reuse types in St. Lucie County.

County/Facility	2005			2008			2030		
	Public Access Irrigation[a] (MGD)	Groundwater Recharge[b] (MGD)	Other[c] (MGD)	Public Access Irrigation[a] (MGD)	Groundwater Recharge[b] (MGD)	Other[c] (MGD)	Public Access Irrigation[a] (MGD)	Groundwater Recharge[b] (MGD)	Other[c] (MGD)
St. Lucie County									
FPUA – Island[d]	0.00	0.00	0.38	0.00	0.00	0.30	--	--	--
FPUA – Mainland[d]	--	--	--	--	--	--	5.40	0.00	11.60
Port St. Lucie, City of – Glades[e]	--	--	--	0.00	0.00	0.00	21.68	24.00	0.00
Port St. Lucie, City of – Southport[f]	0.46	0.00	0.03	0.44	0.00	0.00	--	--	--
Port St. Lucie, City of – Westport	--	--	--	0.61	0.00	0.00	12.53	4.64	0.00
St. Lucie Co. – North (Holiday Pines)	0.00	0.10	0.00	0.00	0.09	0.00	4.20	0.00	0.00
St. Lucie Co. – North Hutchinson Island	0.26	0.00	0.00	0.23	0.00	0.00	0.40	0.00	0.00
St. Lucie Co. – South Hutchinson Island	0.32	0.00	0.00	0.33	0.00	0.00	1.08	0.00	0.00
St. Lucie Co. – North County Regional[g]	--	--	--	--	--	--	--	--	--
St. Lucie Co. – Central County Regional[g]	--	--	--	--	--	--	--	--	--
St. Lucie Co. – South County Regional[g]	--	--	--	--	--	--	--	--	--
St. Lucie West	2.35	0.00	0.00	2.67	0.00	0.00	3.50	0.00	0.00
St. Lucie County Total	**3.39**	**0.10**	**0.41**	**4.28**	**0.09**	**0.30**	**48.79**	**28.64**	**11.60**
UEC Planning Area Total	**6.89**	**0.62**	**0.52**	**7.22**	**0.86**	**0.61**	**56.95**	**28.89**	**12.35**

a. Golf courses, residential, parks, common areas, and other public access areas.

b. Rapid infiltration basins (RIBs), percolation ponds, shallow injection wells, ASR wells.

c. Agriculture, wetlands, cooling water, treatment processes, toilet flushing, etc.

d. The FPUA Island facility is expected to be removed from service in 2018 when the Mainland facility comes online.

e. The Port St. Lucie – Glades facility began operation in 2007.

f. The Port St. Lucie – Southport facility is planned to be taken out of service in 2012.

g. These regional St. Lucie County facilities are included in future plans, but no projected numbers were provided by the utility.

Table D-6. Profiled (featured larger system) facilities – wastewater disposal types in Martin County.

County/Facility	2005			2008			2030		
	Deep Injection Well (MGD)	Ocean Outfall Discharge (MGD)	Surface Water Discharge[a] (MGD)	Deep Injection Well (MGD)	Ocean Outfall Discharge (MGD)	Surface Water Discharge[a] (MGD)	Deep Injection Well (MGD)	Ocean Outfall Discharge (MGD)	Surface Water Discharge[a] (MGD)
Martin County									
Indiantown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Martin Co. – Leilani Heights[b]	0.00	0.00	0.00	--	--	--	--	--	--
Martin Co. – Martin Downs[c]	0.00	0.00	0.00	--	--	--	--	--	--
Martin Co. – Dixie Park[d]	0.00	0.00	0.00	--	--	--	--	--	--
Martin Co. – North County	0.48	0.00	0.00	0.52	0.00	0.00	1.64	0.00	0.00
Martin Co. – Tropical Farms/ Consolidated	0.00	0.00	0.00	0.33	0.00	0.00	2.83	0.00	0.00
South Martin Regional Utilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuart, City of	1.79	0.00	0.00	1.69	0.00	0.00	1.00	0.00	0.00
Martin County Total	**2.27**	**0.00**	**0.00**	**2.54**	**0.00**	**0.00**	**5.47**	**0.00**	**0.00**
UEC Planning Area Total	**10.35**	**0.00**	**0.00**	**14.02**	**0.06**	**1.20**	**11.47**	**0.00**	**1.66**

a. Surface water discharge not including ocean outfalls.

b. The Leilani Heights facility was taken out of service in 2006.

c. The Martin Downs facility was reported in the 2008 Reuse Inventory with individual wastewater flows in (Appendix B), but was part of a consolidated system total for reuse flows (Appendix D).

d. The Dixie Park facility was taken out of service in 2008.

Table D-7. Profiled (featured larger system) facilities – wastewater disposal types in St. Lucie County.

County/Facility	2005			2008			2030		
	Deep Injection Well (MGD)	Ocean Outfall Discharge (MGD)	Surface Water Discharge[a] (MGD)	Deep Injection Well (MGD)	Ocean Outfall Discharge (MGD)	Surface Water Discharge[a] (MGD)	Deep Injection Well (MGD)	Ocean Outfall Discharge (MGD)	Surface Water Discharge[a] (MGD)
St. Lucie County									
FPUA – Island[b]	6.13	0.00	0.00	5.23	0.00	0.00	--	--	--
FPUA – Mainland[b]	--	--	--	--	--	--	0.00	0.00	0.00
Port St. Lucie, City of – Glades[c]	--	--	--	3.58	0.00	0.00	0.00	0.00	0.00
Port St. Lucie, City of – Southport[d]	1.79	0.00	0.00	1.56	0.00	0.00	0.00	0.00	0.00
Port St. Lucie, City of – Westport	--	--	--	1.11	0.00	0.00	0.00	0.00	0.00
St. Lucie Co. – North (Holiday Pines)	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00
St. Lucie Co. – North Hutchinson Island	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
St. Lucie Co. – South Hutchinson Island	0.16	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00
St. Lucie Co. – North County Regional[e]	--	--	--	--	--	--	--	--	--
St. Lucie Co. – Central County Regional[e]	--	--	--	--	--	--	--	--	--
St. Lucie Co. – South County Regional[e]	--	--	--	--	--	--	--	--	--
St. Lucie West	0.00	0.00	0.00	0.00	0.00	1.20	0.00	0.00	1.66
St. Lucie County Total	**8.08**	**0.00**	**0.00**	**11.48**	**0.06**	**1.20**	**6.00**	**0.00**	**1.66**
UEC Planning Area Total	**10.35**	**0.00**	**0.00**	**14.02**	**0.06**	**1.20**	**11.47**	**0.00**	**1.66**

a. Surface water discharge not including ocean outfalls.

b. The FPUA Island facility is planned to be taken out of service in 2018 when the Mainland facility comes online.

c. The Port St. Lucie – Glades facility began operation in 2007.

d. The Port St. Lucie – Southport facility is planned to be taken out of service in 2012.

e. These regional St. Lucie County facilities are included in future plans, but no projected numbers were provided by the utility.

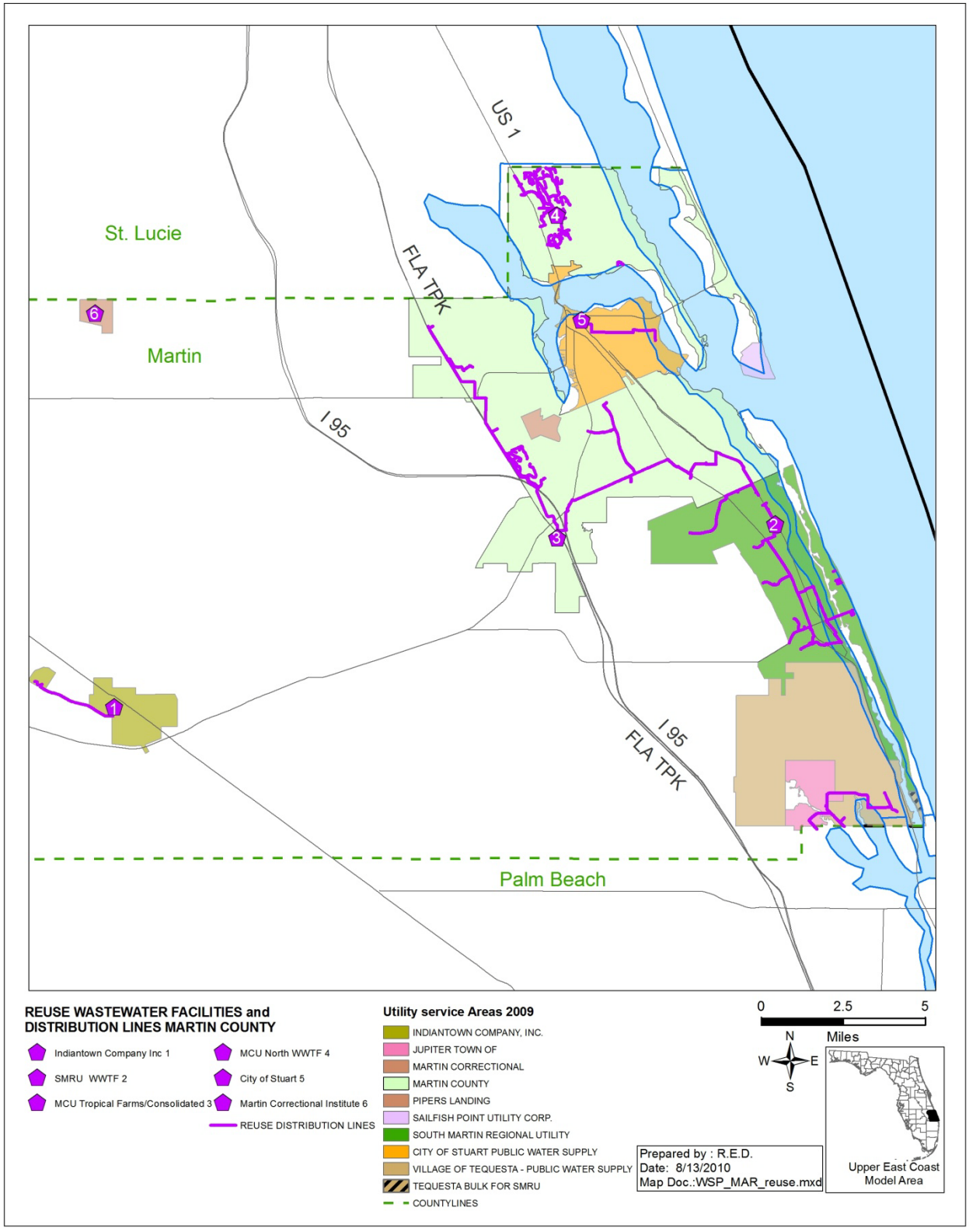

Figure D-5. Reuse facilities in Martin County.

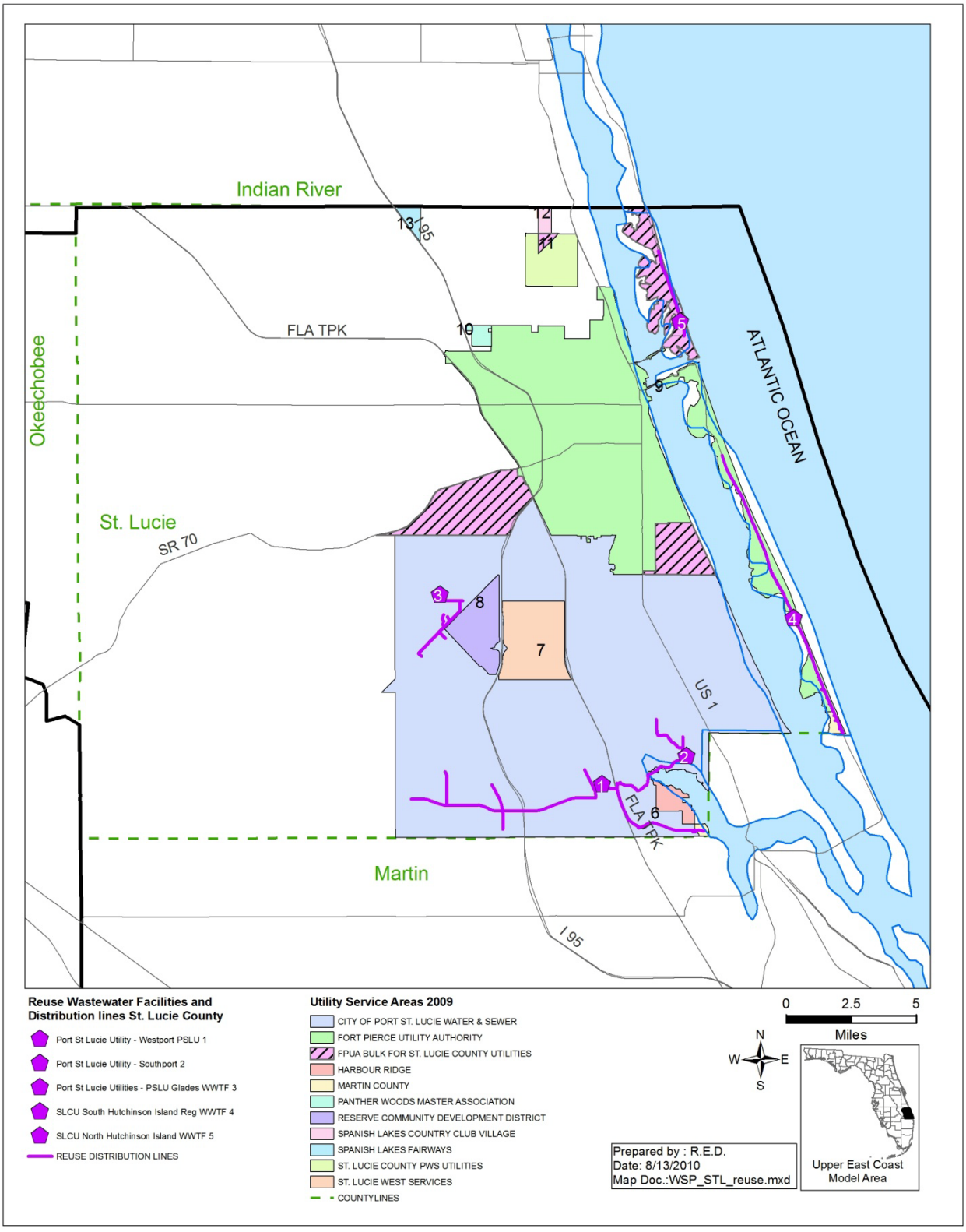

Figure D-6. Reuse facilities in St. Lucie County.

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E
Water Conservation

INTRODUCTION

Water conservation, covered in Chapter 4 of the *2011 Upper East Coast Plan Update* (2011 UEC Plan Update), is essential to water supply planning and water resource management and is considered a water source option because it reduces the need for future expansion of the water supply infrastructure.

This appendix provides further detail about water conservation in the UEC Planning Area and includes the following:

- Status of water conservation implementation
- Water conservation rate structures
- Water conservation versus development of additional water supplies
- Goal-based water conservation plans
- Summary of permitted golf courses, water sources, and irrigation acreage
- Water Savings Incentive Program projects funded in Fiscal Year (FY) 2009

Public Water Supply – Conservation

Table E-1. Martin County Public Water Supply water conservation implementation status.

Public Water Supply Utility	Irrigation Hours Ordinance	Florida-Friendly Landscape Ordinance[a]	Ultralow-Volume Fixtures Ordinance[b]	Rain Sensor Ordinance	Water Conservation Rate Structure	Leak Detect & Repair Program[c]	Public Education Program[d]
Martin County							
Indiantown Company[e]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Martin County Utilities	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Piper's Landing[e]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sailfish Point[e]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
South Martin Regional Utility[e]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stuart , City of	Yes[f]	Yes	Yes	Yes	Yes	Yes	Yes

Note: This information was gathered from consumptive use permits, water conservation plans, and utility staff surveys completed in August and September 2010.

a. Includes Xeriscape™ ordinances not updated to reflect Florida-friendly principles.

b. Utility either adopts its own ordinance or Florida Building Code.

c. Program initiated when unaccounted for water is greater than 10 percent.

d. Programs can vary depending on permit requirements and other factors.

e. Follows Martin County water conservation ordinances.

f. The City of Stuart has an ordinance with two-day-per-week citywide watering restrictions that include certain hours of the day for permissible watering.

Table E-2. St. Lucie County Public Water Supply water conservation implementation status.

Public Water Supply Utility	Irrigation Hours Ordinance	Florida-Friendly Landscape Ordinance[a]	Ultralow-Volume Fixtures Ordinance[b]	Rain Sensor Ordinance	Water Conservation Rate Structure	Leak Detect & Repair Program[c]	Public Education Program[d]
St. Lucie County							
Fort Pierce Utilities Authority	No	Yes	Yes	No[e]	Yes	Yes	Yes
Harbour Ridge[f]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panther Woods Master Association[f]	Yes	Yes	Yes	Yes	No	Yes	Yes
Port St. Lucie Utility Systems Department, City of	Yes	Yes	Yes	No	Yes	Yes	Yes
Reserve Community Development District[f]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Spanish Lakes Fairways[f]	Yes	Yes	Yes	Yes	No	Yes	Yes
St. Lucie County Utilities Department	Yes	Yes	Yes	Yes	Yes	Yes	Yes
St. Lucie West Services District	Yes[g]	Yes	Yes[h]	Yes	No	Yes	Yes

a. Includes Xeriscape™ ordinances not updated to reflect Florida-friendly principles.
b. Utility either adopts its own ordinance or Florida Building Code.
c. Program initiated when unaccounted for water is greater than 10 percent.
d. Programs can vary depending on permit requirements and other factors.
e. Fort Pierce requests that all new development install rain sensors on irrigation systems.
f. Follows St. Lucie County water conservation ordinances.
g. This community has two-day-per-week watering restrictions.
h. This utility has a showerhead and toilet rebate program.

Table E-3. Single-family residential water rates in the UEC Planning Area ($/1,000 gallons).

Utility Name	Effective Date	Utility Tax	Single Family Residential Water Rates $/1,000 gallons[a] Base Charge	1	2	3	4	5	$/3,000 gal	$/7,000 gal	$/10,000 gal
Martin County											
Martin County Utilities	N/A	–	**$15.26**	**$1.97** 0–10,000	**$2.76** 10,001–15,000	**$3.55** 15,001–25,000	**$4.33** >25,000	–	**$21.17**	**$29.05**	**$34.96**
South Martin Regional Utility (North)	February 2010	–	**$17.13**	**$1.52** 0–3,000	**$2.69** 3,001–10,000	**$4.05** 10,001–20,000	**$5.41** 20,001–40,000	**$6.45** >40,000	**$21.69**	**$32.45**	**$40.52**
South Martin Regional Utility (South)	February 2010	–	**$20.49**	**$1.30** 0–3,000	**$2.49** 3,001–10,000	**$4.12** 10,001–20,000	**$5.17** 20,001–40,000	**$6.71** >40,000	**$24.39**	**$34.35**	**$41.82**
Stuart, City of (in city)	April 2010	–	**$8.88**	**$2.25** 0–4,000	**$2.36** 4,001–8,000	**$3.60** 8,001–12,000	**$4.28** 12,001–25,000	**$4.95** >25,000	**$15.63**	**$24.96**	**$34.52**
Stuart, City of (serves unincorp. area)	April 2010	–	**$11.10**	**$2.81** 0–4,000	**$2.95** 4,001–8,000	**$4.50** 8,001–12,000	**$5.35** 12,001–25,000	**$6.19** >25,000	**$19.53**	**$31.19**	**$43.14**
St. Lucie County											
Fort Pierce Utility Authority (in city)	May 2010	10%	**$11.28**	[b]**$8.67** 0–3,000	**$2.89** 3,001–10,000	**$3.60** 10,001–15,000	**$4.33** >15,001	–	**$21.95**	**$34.66**	**$44.20**
Fort Pierce Utility Authority (serves unincorp. area)	May 2010	10%	**$14.10**	[b]**$10.84** 0–3,000	**$3.61** 3,001–10,000	**$4.50** 10,001-15,000	**$5.41** >15,001	–	**$27.43**	**$43.32**	**$55.23**
Jupiter, Town of (in city)	November 2009	–	**$18.28**	**$1.14** 0–6,000	**$1.55** 6,001–14,000	**$2.74** 14,001–30,000	**$3.62** >30,000	–	**$21.70**	**$26.67**	**$31.32**
Jupiter, Town of (serves unincorp. area)	November 2009	–	**$22.85**	**$1.43** 0–6,000	**$1.94** 6,001–14,000	**$3.43** 14,001–30,000	**$4.53** >30,000	–	**$27.14**	**$33.37**	**$39.19**

Utility Name	Effective Date	Utility Tax	Single Family Residential Water Rates $/1,000 gallons[a]						$/3,000 gal	$/7,000 gal	$/10,000 gal
			Base Charge	1	2	3	4	5			
Port St. Lucie Utility Systems Dept., City of	October 2008	–	**$7.37**	**$3.36** 0–5,000	**$4.02** 5,001–12,000	**$4.66** >12,000	–	–	**$17.45**	**$32.21**	**$44.27**
St. Lucie County Utilities Department	July 2010	–	**$19.49**	**$3.37** 0–5,000	**$6.06** 5,001–10,000	**$8.08** 10,001–15,000	**$9.43** >15,000	–	**$29.60**	**$48.46**	**$66.64**
St. Lucie West Services District	October 2009	–	**$15.42**	**$3.47**	–	–	–	–	**$25.83**	**$39.71**	**$50.12**
Tequesta, Village of (in city)	N/A	9%	**$14.27**	**$2.07** 0–12,000	**$3.47** 12,001–25,000	**$4.72** 25,001–40,000	**$6.05** >40,000	–	**$22.32**	**$31.35**	**$38.12**
Tequesta, Village of (serves unincorp. area)	N/A	25%	**$14.27**	**$2.07** 0–12,000	**$3.47** 12,001–25,000	**$4.72** 25,001–40,000	**$6.05** >40,000		**$25.60**	**$35.95**	**$43.71**

a. Information collected from utilities; valid as of February 2010.

b. Customer is charged a flat rate if usage is between 0 gallons and 3,000 gallons.

Water Conservation versus Development of Additional Water Supplies

The following three scenarios are compared to the costs to save water through aggressive water conservation programs:

1. Costs required for full facility construction of between 1 million gallons of water per day (MGD) and 5 MGD using the surficial aquifer or brackish Upper Floridan aquifer as source.
2. Expansion of current facility production through the addition of a low-pressure reverse osmosis (LPRO) train.
3. Expansion using a nanofiltration (NF) train.

Full Facility Construction

Costs for full facility construction to meet a 1 MGD to 5 MGD capacity increase range from $3.42 per 1,000 gallons for a NF facility using surficial groundwater to $11.33 per 1,000 gallons for a LPRO facility using brackish water from the Upper Floridan aquifer (CDM 2007a and 2007b). Costs include expenses for raw water supply, pretreatment, a NF or LPRO process train, and post-treatment. Costs such as annual operations and maintenance expenses, and renewal and replacement fund deposits that are not part of the operations and maintenance expense, are also included. The cost estimates presented in this appendix are considered to be order-of-magnitude estimates as defined by the American Association of Cost Engineers, accurate within +50 percent or -30 percent.

Facility Expansion

Facility expansion costs through the purchase and operation of 1 MGD to 5 MGD capacity LPRO trains range from $3.69 to $10.38 per 1,000 gallons. Costs for 1 MGD to 5 MGD NF process trains range from $3.13 to $9.07 per 1,000 gallons of finished water (CDM 2007a and 2007b). Facility expansion costs include expenses for cartridge filters, membrane feed pumps, pretreatment chemicals, the NF or RO membrane units, piping inside the membrane building, cleaning system, instruments and controls, and electrical equipment. **Table E-4** compares the production costs of developing 1,000 gallons of water supply and the costs of saving 1,000 gallons through water conservation. **Table E-5** shows the costs per day to develop 1 MGD, 3 MGD, and 5 MGD of water supply versus water conservation.

Table E-4. Comparison of water supply development production costs and water conservation costs for 1,000 gallons.

Water Conservation[a]	New Facility Construction		Expansion of Existing Facility	
Typical Retrofit/Replacement Programs[b]	Nanofiltration Capacity 1 to 5 MGD	LPRO Capacity 1 to 5 MGD	NF Process Train Capacity 1 to 5 MGD	LPRO Train Capacity 1 to 5 MGD
[c]$0.40 to $2.00	$9.46 to $3.42	$11.33 to $4.41	$9.07 to $3.13	$10.38 to $3.69

a. The cost of 1,000 gallons of water saved is based on the cost of all devices across the service life and the number of gallons saved per day normalized to 1,000 gallons. The actual figure is calculated as follows:

[(Cost per device × Number of devices)/Service life/365] / (Gallons saved per day by all devices in program/1,000).

b. Typical programs support the purchase and installation of efficient toilets, faucet aerators, showerheads, irrigation sprayheads, rain and soil moisture sensors, and computerized irrigation controllers for large-scale irrigation.

c. Utilities do not typically implement water conservation programs with costs over $2.00 per 1,000 gallons of water saved; therefore, projects exceeding $2.00 per 1,000 gallons of water saved were not considered for this comparison.

Table E-5. Comparison of water supply development production costs per day and water conservation costs per day.

	Water Conservation[a]	Nanofiltration	LPRO	NF Process Train	LPRO Train
1 MGD	$2,000	$9,460	$11,330	$9,070	$10,380
3 MGD	$6,000	$13,500	$17,430	$12,330	$14,580
5 MGD	$10,000	$17,100	$22,050	$15,650	$18,450

a. Water conservation costs factored at $2.00 per 1,000 gallons.

As shown in **Table E-4**, the unit cost per 1,000 gallons of finished water increases sharply as new facility or facility expansion capacity decreases from 5 MGD to 1 MGD. In addition to economies of scale, fixed capital costs associated with treatment processes or equipment do not decrease with the reduction in the facility treatment capacity. For example, the fixed capital cost of a deep injection well for concentrate disposal for a 1-MGD LPRO water treatment facility is the same as the cost for concentrate disposal for a 5-MGD or a 20-MGD LPRO facility. The concentrate disposal cost becomes a much larger component of the total project cost as the facility capacity decreases. For this reason, many utilities do not consider LPRO and other facilities using membrane water treatment processes cost-effective below the 3-MGD to 5-MGD capacity range.

As **Table E-4** shows, within the 1-MGD to 5-MGD capacity range, the unit cost for the production of new water using a particular technical process is nearly identical for the costs of capacity expansion of an existing facility and the construction of a new facility. Within the 1-MGD to 5-MGD capacity range, both water supply development cost options are significantly higher than the cost of water conservation. Although water conservation is not always the most feasible water source option, it is the most cost-effective alternative water supply solution in many cases.

Goal-based Water Conservation Plans

Goal-based Water Use Efficiency Plan

A good example of a goal-based water use efficiency plan is the *Miami-Dade County Water Use Efficiency Five-Year Plan* (Miami-Dade County 2006). This initial five-year plan became the basis for the *Miami-Dade County Water Use Efficiency 20-Year Plan* (Miami-Dade County 2007), which is estimated to generate 19.6 MGD in water savings by 2026. Since 2006, each dollar the Miami-Dade Water and Sewer Department (MDWASD) spent implementing its water conservation plan deferred or eliminated between $5 and $9 in capital project costs. This calculation is based on the initial cost estimates of water supply development and quantified water conservation savings observed through 2009.

The county's water conservation plan contains both quantifiable and non-quantifiable conservation best management practices (BMPs) and measures. Some of the practices and measures include indoor plumbing fixture retrofit projects, permanent two-day-per-week residential watering restrictions, and residential irrigation efficiency improvement projects.

The quantifiable measures included in the MDWASD's goal-based water conservation plan were evaluated and selected using the Conserve Florida Water Clearinghouse's water conservation tool. At the time this Plan Update was written, the tool was called the EZ Guide and available at http://www.conservefloridawater.org/ez_guide.asp. Only measures costing the utility less than $0.9605 per 1,000 gallons saved (the cost of water production for the utility) were included in the initial plan. The MDWASD is currently revising its production cost per gallon of water to include all withdrawal, treatment, and transportation costs.

The water conservation plan implementation, together with smaller-than-projected population growth rates and the area's economic downturn, culminated in a per capita water demand reduction from 154 gallons per capita per day (GPCD) in 2005 (before the plan was adopted) to 140 GPCD in 2009. Since 2006, the MDWASD has spent $3,046,000 implementing its water conservation plan. The county achieved a three-year cumulative water savings of 9.59 MGD. The implementation cost does not include costs associated with water loss reduction efforts.

Table E-6 summarizes the MDWASD's water conservation budget, the estimated water savings from the quantifiable water conservation measures, and the overall shift in GPCD during the three-year period from 2006–2009.

Table E-6. Miami-Dade Water and Sewer Department water conservation plan expenses and effects on consumption.

	2006	2007	2008	2009
20-Year Water Conservation Plan Budget		$903,000	$943,000	$1,200,000
Estimated Water Saved (MGD)[a]		1.2	3.5	4.0
Finished Water Demand (MGD)	341.6	319.5	309.9	312.5
Water Demand (GPCD)	157.0	140.0	138.0	[b]140.0

a. Quantifiable water conservation programs only.

b. Increased GPCD consumption is attributed, in part, to an increase in commercial consumption and an increase in residential outdoor water use after the SFWMD removed its drought restrictions. The MDWASD began a targeted messaging campaign to generate public awareness concerning the county's permanent, year-round, two-day-per-week watering restrictions.

The drop in per capita water demand enabled the MDWASD to reschedule its water supply development plan and extend the life of its consumptive water use permit. **Figure E-1** shows the original and revised water supply development project schedules, and the pre- and post-conservation finished water demand curves. The development of Projects 1 and 2 (totaling 11.9 MGD of new water supply at a $16.7 million cost) was a limiting condition of the MDWASD's consumptive water permit. If these projects were completed, they would bridge the MDWASD's water supply needs until the Floridan wells (Projects 3, 5, and 8) became operational.

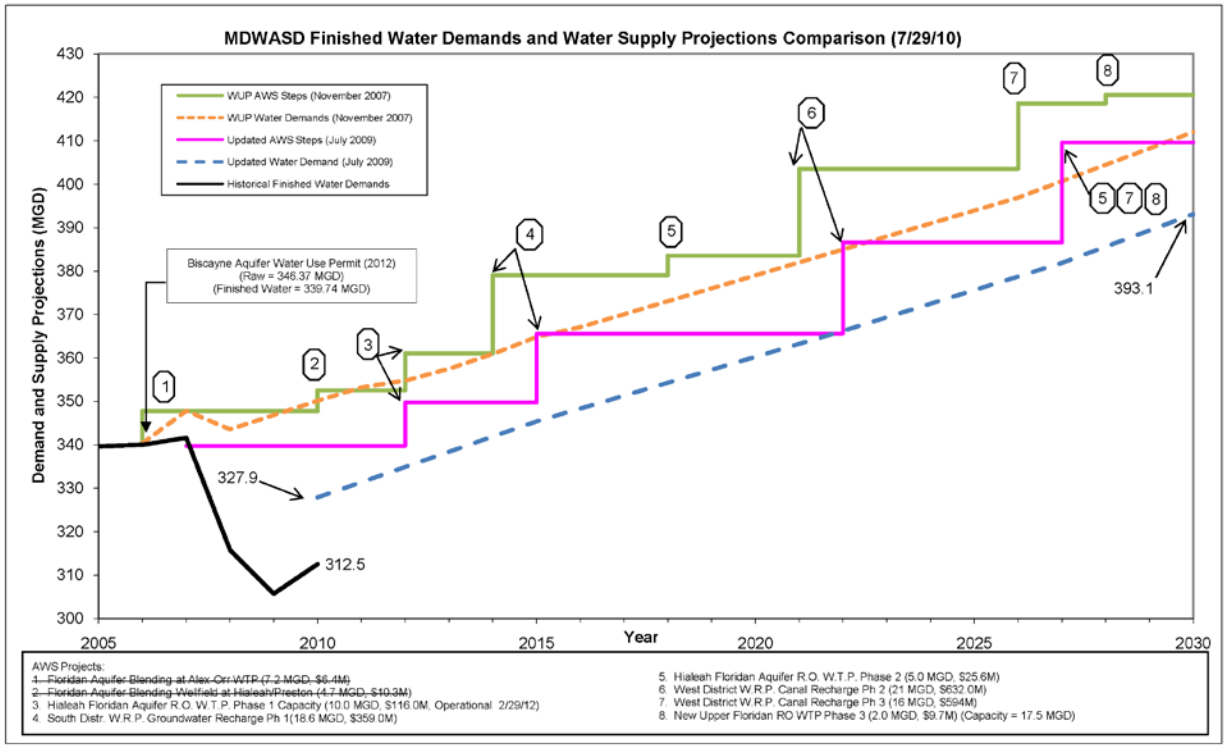

Figure E-1. MDWASD finished water demands and water supply projections comparison.

Projects 1 and 2 were initially halted due to water quality issues, and were not replaced due in part to the water savings achieved through water conservation efforts. Due to the 17-MGD drop in GPCD since 2006, the MDWASD remained within its Biscayne aquifer water supply allocation and subsequently shifted its 2027 demand to 2030. The District has since extended the MDWASD's current consumptive use permit by three years, to 2030, which defers additional expenses incurred for modeling and other necessary permit application preparation work.

The county's new water supply development schedule postpones the construction of four of its remaining six projects. **Table E-7** provides a list of specific measures taken.

Table E-7. Miami-Dade Goal-based Water Use Efficiency Plan – water conservation measures and best management practices (BMPs).

Operational Measures
Metering program
System audits and leak detection/repair
Recycled water for filter backwashing at treatment facilities
Distribution system pressure control
Wholesale water supplier assistance program
Policy Measures
Ultralow-volume plumbing fixtures for new ordinance
Year-round outdoor irrigation restrictions
Use of Florida-friendly landscaping principles
Use of Smart Irrigation controllers on residential systems
Expedited review of building permit applications
Sustainable development building measures for county buildings
Reuse feasibility study
Conservation rate structure
Requirements for water conservation planning/implementation by wholesale customers
Water re-metering ordinance
Proposed retrofit upon sale ordinance
Proposed mandatory reuse area ordinance
Educational Measures
Media campaigns
Public informational materials
In-school programs
Outreach and public education
Water conservation retrofit kit giveaways
Quantifiable BMPs
Non-potable irrigation source replacement or rebates
Showerhead exchange retrofit kit giveaways
High-efficiency clothes washer rebates
Water efficiency irrigation system evaluations and rebates for smart controllers and soil moisture sensors
Industrial, commercial, and institutional water use evaluations

UEC Golf Courses – Irrigation

A summary of permitted golf courses in the SFWMD UEC Planning Area along with water source and irrigated acreage information is provided in **Table A-34** and **Table A-38** of **Appendix A**.

Water Savings Incentive Program

Table E-8. Water Savings Incentive Program projects funded between FY 2006 and FY 2009.

Funding Year	County	Award Recipient	Project Description	Estimated Project Cost	Approved Funding	Estimated Water Savings in (MGY)
2005	Martin	South Martin Regional Utility	Installation of rain sensors and irrigation timers	$6,500	$3,250	6.20
2005	Martin	Martin County Soil & Water Conservation District	Installation of residential rain shut-off devices	$49,800	$11,000	8.90
2005	St. Lucie	St Lucie County	Indoor plumbing retrofit program for low-income housing	$100,000	$50,000	3.00
2005	St. Lucie	City of Port St. Lucie	Irrigation system retrofit including soil moisture sensor and shut-off devices	$80,150	$40,075	12.60
2007	St. Lucie	St Lucie County	Indoor plumbing retrofit program	$100,000	$50,000	26.00
2008	St. Lucie	St Lucie County Board of County Commissioners	Indoor plumbing fixture retrofit program	$100,000	$25,000	33.00
2008	St. Lucie	Hydro-Fresh Farms	Drip hydroponics system	$120,000	$25,000	35.95
2009	St. Lucie	City of Port St. Lucie	Purchase and installation of automatic fire hydrant flushing devices	$20,700	$10,350	81.14
2009	Martin	City of Stuart	Landscape irrigation efficiency rebate program	$20,000	$10,000	7.53
2009	Martin	City of Stuart	Indoor plumbing retrofit exchange program	$10,000	$5,000	4.02
2009	Martin	City of Stuart	Toilet retrofit rebate program	$20,000	$10,000	2.63
2009	Martin	Village of 800 Place Condominium Association, Inc.	Irrigation system improvement program	$17,675	$8,837	0.60

MGY = million gallons per year.

REFERENCES

CDM (Camp Dresser & McKee. Inc.). 2007a. *Water Supply Cost Estimation Study.* Prepared by CDM for the South Florida Water Management District (SFWMD), West Palm Beach, FL.

CDM. 2007b. *Water Supply Cost Estimation Study – Phase II Addendum.* Prepared by CDM for the SFWMD, West Palm Beach, FL.

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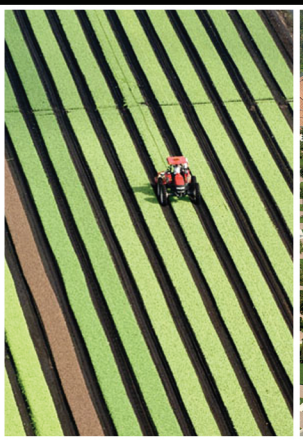
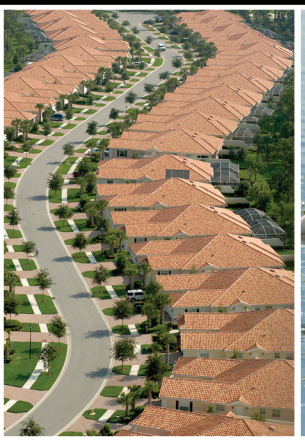


Meeting South Florida's water supply needs while safeguarding its natural systems requires innovative solutions, cohesive planning, and a shared vision.

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