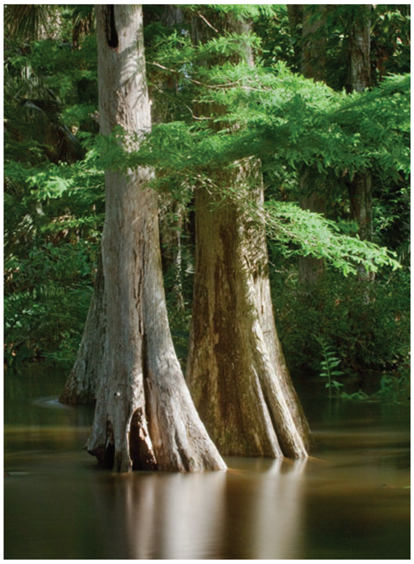
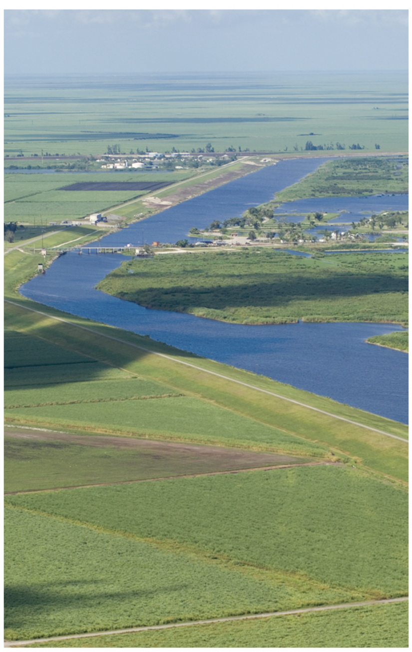
SOUTH FLORIDA WATER MANAGEMENT DISTRICT



LOWER EAST COAST
WATER SUPPLY PLAN UPDATE

Appendices

2018



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Information for Local Governments

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The South Florida Water Management District (SFWMD or District) prepares water supply plans for each of its five planning areas to effectively support planning initiatives and address regional and local issues. The water supply plans address a planning horizon of at least 20 years and are updated every 5 years. Most local governments are required by statute to update their Water Supply Facilities Work Plan (Work Plan) and adopt revisions to their Comprehensive Plan within 18 months following the applicable water supply plan's approval [Section 163.3177(6)(c)3., Florida Statutes (F.S.)].

This appendix contains water supply planning information useful to local governments in preparing and amending Comprehensive Plans. The following chapters and appendices also are relevant for local governments:

Water Sources	Chapter 7
Utility Areas Served (2016 and 2040)	Appendices B and E
Population Projections (2016–2040)	Chapter 2; Appendix B
Demand Projections (2016–2040)	Chapter 2; Appendices B and E
Water Supply Projects (2016–2040)	Chapter 8; Appendix E

This appendix includes the following information for the review and revision of local government documents:

- Comprehensive Plan requirements (relevant Florida Statutes are provided below)
- Utilities serving local governments

COMPREHENSIVE PLAN REQUIREMENTS

Local governments are required to plan for their water and wastewater needs as well as other infrastructure and public service elements of their Comprehensive Plan. To assist in that effort, the SFWMD developed a general checklist of the types of data and information District staff looks for during review of the water supply element, policies, and other topics in the local government Comprehensive Plans. This checklist is not all-inclusive but provides a general framework for use with the more detailed Florida Department of Economic Opportunity (FDEO) guidelines.

INFO

Local Government Planning Documents:

A **Comprehensive Plan** is a document required by statute that details the guidelines, principles, and strategies for responsible growth and development of a community.

A **Water Supply Facilities Work Plan** identifies water supply, conservation, and reuse projects necessary to meet the service area's water needs for at least the next 10 years.

Checklist guidance is given for four water supply-related aspects of Comprehensive Plans:

1. Work Plans
2. Sector Plans
3. Evaluation and appraisal of Comprehensive Plan requirements
4. Plan amendments

LAW/CODE

Relevant Florida Statutes for Water-Related Aspects of Comprehensive Plans

Section 163.3767(2)	Requirement for local government to maintain a Comprehensive Plan
Sections 163.3177(4)(a) and 373.709	Coordinate Comprehensive Plan and Work Plan with the applicable regional water supply plan
Section 163.3177(6)(c)	Sanitary sewer and potable water sub-elements
Sections 163.3177(6)(a), (c)3, and (5)	Water Supply Facilities Work Plan
Sections 163.3177(6)(c) and (3)(a)	Level of service standards (per capita use rates) for public facilities
Sections 163.3177(3)(a) and 163.3180 (2)	Concurrency and management systems
Sections 163.3177(6)(a) and (c)	Population and water supply demand projections
Sections 163.3177(6)(c) and 373.709(8)(b)	Identify traditional and alternative water supply projects as well as conservation and reuse programs
Section 163.3177(3)	Annual review and updating of the Capital Improvements element and 5-year capital improvement schedule
Section 163.3177 (6)(a)	Future land use plan-related Comprehensive Plan amendments
Sections 163.3167(9) and 163.3177(6)(d)	Conservation Element amendments of Comprehensive Plan
Section 163.3177 (6)(h)	Intergovernmental Coordination Element amendments of Comprehensive Plan
Section 163.3191	Evaluation and appraisal review of Comprehensive Plan and Work Plan
Section 163.3245	Sector Plans
Section 163.3177(6)(c)4.	Exemptions to Work Plans

Work Plans

Found within local Comprehensive Plans, Work Plans are part of the link between the regional and local water supply planning efforts. This *2018 Lower East Coast Water Supply Plan Update* (2018 LEC Plan Update) provides water demand estimates, water source options, and water supply development projects to ensure adequate water supplies for the region. The data included in the Work Plans (e.g., population and water demand projections, future projects) should be consistent with the 2018 LEC Plan Update. The SFWMD coordinates with local governments, utilities, regional planning councils, and the FDEO to assist local governments as they update their Work Plans.

Identification of Public Water Suppliers

A local government's Work Plan must identify the Public Water Supply (PWS) entities serving their population. To be consistent with the 2018 LEC Plan Update, Work Plans should identify, at a minimum, the water demands within the local government's boundary and the adequacy of PWS sources to meet those demands. If the local government provides water to or receives water from PWS entities beyond the local government's boundary, the volumes should be identified. This 2018 LEC Plan Update identifies PWS entities with projected average pumpage of 0.1 million gallons per day (mgd) or greater. Smaller utilities are included in the Domestic and Small Public Supply (DSS) category. The FDEO and SFWMD guidance for Work Plans recommends including all small community systems and DSS users on private wells in the local government's Work Plan.

Review of Public Water Supply Utility Summaries

Through coordination with PWS entities, utility summaries were prepared as part of this 2018 LEC Plan Update (**Appendix E**) containing information such as current and future population projections, per capita use rates, net (finished) water demands (i.e., after any losses due to water treatment), permitted sources and allocations, and recently constructed and proposed water supply development projects. Within 12 months of approval of this plan update, PWS entities must respond to the SFWMD with their intentions to develop and implement the projects identified by the plan update or provide a list of alternative projects or methods to meet water demands.

The content of a local government's Work Plan should be in agreement with this 2018 LEC Plan Update's identified 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 water supply plan to project water demand. Generally accepted 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 this 2018 LEC Plan Update. If planning assumptions are different from this 2018 LEC Plan Update, the Work Plan should identify and explain the basis for any differences.

Local government Work Plans and the 2018 LEC Plan Update are not required to have the same planning horizon. The minimum planning period for water supply plans is 20 years (referred to as the 20-year planning horizon). Local government Work Plans must have at least a minimum 10-year planning horizon [Section 163.3177(6)(c)3., F.S.], although a 20-year planning horizon is preferred.

To assist local governments in updating their Work Plans, the SFWMD developed technical assistance tools and informational documents, which are available on the SFWMD website (www.sfwmd.gov; Search: Work Plan). Additional information about developing a Work Plan is available from the FDEO website at http://www.floridajobs.org (Community Planning and Development).

Checklist of Key Considerations for Work Plan Amendments

Water Supply Demand Projections

- Revise the adopted Work Plan to be consistent with the water demand estimates and population projections listed in the 2018 LEC Plan Update.
- Plan for gross (raw) and net (finished) water supply demands within the jurisdiction of each supplier.
- Cover at least a 10-year planning period.
- Plan for the building of all public and private water supply facilities.
- Include the purchase of bulk water necessary to provide water supply service within the local government's jurisdiction.
- If a local government provides water outside of its jurisdiction, plan for gross (raw) and net (finished) water supply demands for the area served.
- Provide separate projections for existing and future DSS.

Water Source Identification

- Review the water supply sources identified by the local government or its water suppliers, as necessary, to meet existing and projected water use demand for the established planning period. This information should be compared with the available sources in this plan update.
- Identify the general DSS areas.

Water Supply Project Identification

- Incorporate water supply project(s) selected by the utility or utilities providing PWS to the local government, as identified in the 2018 LEC Plan Update, or propose alternatives for inclusion in the Work Plan.
    - All other public and private water supply capital improvements (e.g., wells, treatment plants, distribution systems) necessary to maintain level-of-service standards within the service area should be included in the Work Plan.
- Coordinate the Work Plan water supply projects with this 2018 LEC Plan Update and the water supplier(s) annual progress reports, and update the Work Plan accordingly.
- Identify how water conservation, reclaimed water, and water supply projects will be incorporated to meet projected demands.
- Update the capital improvements element, as required.

Water Supply Intergovernmental Coordination

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

- Review existing (2016) and future (2040) service area maps, found at the end of this appendix (**Figures A-1** to **A-6**), for each utility. Compare and update the Work Plan as needed. (Note: Service area maps are not provided in this appendix for the LEC Planning Area portions of Monroe, Collier, and Hendry counties.)
    - Identify existing or potential service area conflicts and solutions. Include a conflict resolution policy.
    - Ensure the water supply for all areas of the local government are accounted for by the local governments' own utility or other providers.
- Review and update the Work Plan language concerning needed coordination with water supplier(s), local governments and entities, and others.
    - Include updates to agreements (e.g., bulk service agreements, interconnect agreements).
- Private utilities located within local government service areas should provide utility information to the local government responsible for the Work Plan.

Related Comprehensive Plan Amendments

This 2018 LEC Plan Update may require changes to Work Plans and possibly other elements within Comprehensive Plans. Revisions may include population projections, established planning periods, existing and future water resource projects, intergovernmental coordination activities, conservation and reuse measures, and the capital improvements element.

- If additional revisions are needed for coordination with this 2018 LEC Plan Update but are not listed here, incorporate changes into the Comprehensive Plan and Work Plan, as appropriate.
- Review the Comprehensive Plan for consistency among all sections of the Work Plan and other elements in consideration of all proposed modifications. Other Comprehensive Plan elements that may need updating include future land use, potable water, sanitary sewer, conservation, intergovernmental coordination, and capital improvements.

Sector Plans

A Sector Plan is a long-term plan (20 to 50 years) for a geographic area of at least 5,000 acres. The focus of a Sector Plan, which is included in the Comprehensive Plan, should be on water needs, water source and resource development, and water supply development projects needed to address projected development in the Sector Plan area. Currently, there are no approved Sector Plans in the LEC Planning Area. Additional information on Sector Plans is provided in Section 163.3245, F.S.

Evaluation and Appraisal Review of Comprehensive Plans

At least every 7 years, local governments shall evaluate the need to amend their Comprehensive Plan, addressing changes in state requirements since the last Comprehensive Plan update. While an evaluation and appraisal report is not required, local governments are encouraged to evaluate and, as necessary, update Comprehensive Plans to reflect changes in local conditions.

Water Supply Project Identification and Selection

Local governments are encouraged to evaluate water supply projects to address the following issues:

- 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 Work Plan has been implemented for building all public and private water supply facilities within the local government's jurisdiction necessary to meet projected demands.
- Provide recommendations for revising the Work Plan and the applicable Comprehensive Plan elements to address the conclusions of the evaluation, as necessary.

Comprehensive Plan Amendments

Water Supply Demand Projections

Comprehensive Plan amendments must address water supply demand projections, including the following:

- Address gross (raw) and net (finished) water supply needs for potable and nonpotable demands, using professionally acceptable methodologies for population projections and per capita use rates.
- Address water conservation and reuse commitments for the proposed future land use change.
- Address the build-out time frame for the proposed changes and the established planning period for the Comprehensive Plan.
- Address any other concerns or information impacting water supply and water demand projections.

Water Source Identification

Comprehensive Plan amendments should identify and include details about the water source(s), including the following:

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

Availability of Water Supply and Public Facilities

Comprehensive Plan amendments must include information about the availability of water supply and public facilities for the proposed change, including the following:

- Demonstrate that there is an available gross (raw) water supply from the proposed source(s) for the future land use change, given all other approved land use commitments within the local government's jurisdiction over the proposed amendment's build-out and the established planning period of the Comprehensive Plan.
- Demonstrate that there is sufficient treatment facility capacity and permitted net (finished) water supply for future land use change, given all other commitments for that capacity and supply over the proposed build-out time frame.
- If the availability of water supply and/or public facilities cannot be demonstrated, phasing of the future land use and/or appropriate amendments to the capital improvements element/potable water sub-element will be required to ensure the necessary capital planning and timely availability of the needed infrastructure and water supply.
- 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.

UTILITIES SERVING LOCAL GOVERNMENTS

Table A-1 identifies the local governments within the LEC Planning Area and the PWS utilities with treatment capacity and water use of 0.10 mgd or greater. The first column in **Table A-1** lists the name of the local government, and the second column identifies the local government(s) or private PWS utility, or utilities, providing gross (raw) or net (finished) water to the local government.

Table A-2 identifies the PWS utilities providing gross (raw) or net (finished) water to the local governments within the LEC Planning Area. The first column of **Table A-2** lists the name of the PWS utility, the second column provides the type of utility, and the third column identifies the incorporated and unincorporated areas of the LEC Planning Area within that PWS utility's service area.

Table A-1. Water utilities and entities serving local/tribal governments in the LEC Planning Area.

Local/Tribal Government	Utility/Entity Serving Local/Tribal Government
Palm Beach County	
Palm Beach County (unincorporated)	Palm Beach County WUD, City of Boca Raton, City of Boynton Beach, City of Delray Beach, Village of Golf, Town of Jupiter, City of Lake Worth, Maralago Cay, Village of Palm Springs, Seacoast Utility Authority, Seminole Improvement District, Tropical Breeze Estates, Village of Tequesta, Village of Wellington, and City of West Palm Beach
Atlantis, City of	Palm Beach County WUD
Belle Glade, City of	Palm Beach County WUD Western Region
Boca Raton, City of	City of Boca Raton and Palm Beach County WUD
Boynton Beach, City of	City of Boynton Beach and Palm Beach County WUD[a]
Briny Breezes, Town of	City of Boynton Beach
Cloud Lake, Town of	Palm Beach County WUD
Delray Beach, City of	City of Delray Beach
Glen Ridge, Town of	Palm Beach County WUD
Golf, Village of	Village of Golf
Greenacres, City of	Palm Beach County WUD
Gulf Stream, Town of	City of Delray Beach
Haverhill, Town of	Palm Beach County WUD
Highland Beach, Town of	Town of Highland Beach
Hypoluxo, Town of	City of Boynton Beach and Town of Manalapan
Juno Beach, Town of	Town of Jupiter and Seacoast Utility Authority
Jupiter, Town of	Town of Jupiter
Jupiter Inlet Colony, Town of	Village of Tequesta
Lake Clarke Shores, Town of	Palm Beach County WUD, Town of Lake Worth[a], and Village of Palm Springs
Lake Park, Town of	Seacoast Utility Authority
Lake Worth, City of	City of Lake Worth and Palm Beach County WUD[a]
Lantana, Town of	Town of Lantana
Loxahatchee Groves, Town of	Palm Beach County WUD
Manalapan, Town of	Town of Manalapan
Mangonia Park, Town of	Town of Mangonia Park
North Palm Beach, Village of	Seacoast Utility Authority
Ocean Ridge, Town of	City of Boynton Beach
Pahokee, City of	Palm Beach County WUD Western Region
Palm Beach, Town of	City of West Palm Beach Public Utilities
Palm Beach Gardens, City of	Seacoast Utility Authority
Palm Beach Shores, Town of	City of Riviera Beach
Palm Springs, Village of	Village of Palm Springs and Palm Beach County WUD
Riviera Beach, City of	City of Riviera Beach
Royal Palm Beach, Village of	Palm Beach County WUD and Wellington Public Utilities Department
South Bay, City of	Palm Beach County WUD Western Region
South Palm Beach, Town of	City of West Palm Beach Public Utilities
Tequesta, Village of	Village of Tequesta
Wellington, Village of	Village of Wellington and Palm Beach County WUD
Westlake, City of	Seminole Improvement District and Palm Beach County WUD[a]
West Palm Beach, City of	City of West Palm Beach Public Utilities and Palm Beach County WUD

Local/Tribal Government	Utility/Entity Serving Local/Tribal Government
Broward County	
Broward County (unincorporated)	Broward County WWS, City of Hollywood, and Sunrise Utilities Department
Coconut Creek, City of	Broward County WWS District 2 and City of Margate
Cooper City, City of	Cooper City Utilities Department
Coral Springs, City of	City of Coral Springs, Coral Springs Improvement District, North Springs Improvement District, and Royal Utility Corporation
Dania Beach, City of	City of Dania Beach, City of Hollywood, and Broward County WWS District 3
Davie, Town of	City of Hollywood, Town of Davie, City of Fort Lauderdale, Sunrise Utilities Department, Tindell Hammock, and Broward County WWS District 3
Deerfield Beach, City of	City of Deerfield Beach and Broward County WWS District 2
Fort Lauderdale, City of	City of Fort Lauderdale and Broward County WWS District 1
Hallandale Beach, City of	City of Hallandale Beach and Broward County WWS District 3
Hillsboro Beach, Town of	Town of Hillsboro Beach
Hollywood, City of	City of Fort Lauderdale, City of Hollywood, and Broward County WWS District 3
Lauderdale-by-the-Sea, Town of	City of Fort Lauderdale and City of Pompano Beach Utilities Department
Lauderdale Lakes, City of	Broward County WWS District 1 and City of Fort Lauderdale
Lauderhill, City of	City of Lauderhill, City of Fort Lauderdale, and Broward County WWS District 1
Lazy Lake, Village of	City of Fort Lauderdale
Lighthouse Point, City of	City of Pompano Beach Utilities Department and Broward County WWS District 2
Margate, City of	City of Margate
Miramar, City of	City of Miramar and Broward County WWS District 3
North Lauderdale, City of	City of North Lauderdale, City of Fort Lauderdale, City of Tamarac, and Broward County WWS District 1
Oakland Park, City of	City of Oakland Park, City of Fort Lauderdale and Broward County WWS District 1
Parkland, City of	Parkland Utilities, Inc., North Springs Improvement District, and City of Coconut Creek
Pembroke Park, Town of	Broward County WWS District 3
Pembroke Pines, City of	City of Pembroke Pines and Broward County WWS
Plantation, City of	City of Plantation
Pompano Beach, City of	City of Pompano Beach Utilities Department and Broward County WWS Districts 1 and 2
Sea Ranch Lakes, Village of	City of Fort Lauderdale
Seminole Tribe of Florida	Seminole Tribe of Florida's Hollywood Reservation, City of Hollywood, Town of Davie, Broward County WWS District 2 via City of Coconut Creek[a]
Southwest Ranches, Town of	City of Pembroke Pines, Cooper City Utilities, and Sunrise Utilities Department
Sunrise, City of	Sunrise Utilities Department
Tamarac, City of	City of Tamarac, City of Fort Lauderdale, and Broward County WWS District 1
Weston, City of	Sunrise Utilities Department
West Park, City of	Broward County WWS District 3
Wilton Manors, City of	City of Fort Lauderdale

Local/Tribal Government	Utility/Entity Serving Local/Tribal Government
Miami-Dade County	
Miami-Dade County (unincorporated)	City of Homestead, City of North Miami Beach, City of North Miami, and MDWASD
Aventura, City of	City of North Miami Beach, City of Opa-Locka, and MDWASD
Bal Harbour Village, City of	MDWASD
Bay Harbor Islands, Town of	MDWASD
Biscayne Park, Village of	City of North Miami
Coral Gables, City of	MDWASD
Cutler Bay, Town of	MDWASD
Doral, City of	MDWASD
El Portal, Village of	MDWASD
Florida City, City of	Florida City Water and Sewer Department, City of Homestead, and MDWASD
Golden Beach, Town of	City of North Miami Beach
Hialeah, City of	MDWASD
Hialeah Gardens, City of	MDWASD
Homestead, City of	City of Homestead and MDWASD
Indian Creek, Village of	MDWASD
Key Biscayne, Village of	MDWASD
Medley, Town of	MDWASD
Miami, City of	MDWASD
Miami Beach, City of	MDWASD
Miami Gardens, City of	City of North Miami Beach, City of Opa-Locka, and MDWASD
Miami Lakes, Town of	MDWASD
Miami Shores, Village of	City of North Miami and MDWASD
Miami Springs, City of	MDWASD
Miccosukee Tribe of Indians	MDWASD
North Bay Village, City of	MDWASD
North Miami, City of	City of North Miami and MDWASD
North Miami Beach, City of	City of North Miami Beach
Opa-Locka, City of	MDWASD
Palmetto Bay, Village of	MDWASD
Pinecrest, Village of	MDWASD
South Miami, City of	MDWASD
Sunny Isles Beach, City of	City of North Miami Beach
Surfside, Town of	MDWASD
Sweetwater, City of	MDWASD
Virginia Gardens, Village of	MDWASD
West Miami, City of	MDWASD
Monroe County	
Monroe County (unincorporated)	Florida Keys Aqueduct Authority
Islamorada, Village of Islands	Florida Keys Aqueduct Authority
Key Colony Beach, City of	Florida Keys Aqueduct Authority
Key West, City of	Florida Keys Aqueduct Authority
Layton, City of	Florida Keys Aqueduct Authority
Marathon, City of	Florida Keys Aqueduct Authority
Hendry County	
Seminole Tribe of Florida	Seminole Tribe of Florida’s Big Cypress Reservation

MDWASD = Miami-Dade Water and Sewer Department; WUD = Water Utilities Department; WWS = Water & Wastewater Services.

[a] Utility serves local government through bulk water agreement.

Table A-2. Water utilities and local/tribal governments serving the LEC Planning Area.

Utility/Entity Name	Utility Type	Local/Tribal Governments Served (Raw or Finished)
Palm Beach County		
Boca Raton, City of	Local Government	City of Boca Raton and unincorporated Palm Beach County
Boynton Beach, City of	Local Government	City of Boynton Beach, Town of Briny Breezes, Town of Hypoluxo, Town of Ocean Ridge, and unincorporated Palm Beach County
Delray Beach, City of	Local Government	City of Delray Beach, Town of Gulf Stream, and unincorporated Palm Beach County
Golf, Village of	Local Government	Village of Golf and unincorporated Palm Beach County
Highland Beach, Town of	Local Government	Town of Highland Beach
Jupiter, Town of	Local Government	Town of Jupiter, Town of Juno Beach, and unincorporated Martin[a] and Palm Beach counties
Lake Worth, City of	Local Government	City of Lake Worth, Town of Lake Clarke Shores[b], and unincorporated Palm Beach County
Lantana, Town of	Local Government	Town of Lantana
Manalapan, Town of	Local Government	Town of Manalapan and Town of Hypoluxo
Mangonia Park, Town of	Local Government	Town of Mangonia Park
Maralago Cay	Privately Owned	Unincorporated Palm Beach County
Palm Beach County Water Utilities Department	Local Government	City of Atlantis, City of Boca Raton, City of Boynton Beach[b], Town of Cloud Lake, Town of Glen Ridge, City of Greenacres, Town of Haverhill, Town of Lake Clarke Shores, City of Lake Worth[b], Town of Loxahatchee Groves, Village of Palm Springs, City of Parkland, Village of Royal Palm Beach, Seminole Improvement District[b], Village of Wellington, City of Westlake[b], City of West Palm Beach, and unincorporated Palm Beach County
Palm Beach County Water Utilities Department Western Region	Local Government	City of Belle Glade, City of Pahokee, and City of South Bay
Palm Springs, Village of	Local Government	Village of Palm Springs, Town of Lake Clarke Shores, and unincorporated Palm Beach County
Riviera Beach, City of	Local Government	City of Riviera Beach and Town of Palm Beach Shores
Seacoast Utility Authority	Special District	Town of Juno Beach, Town of Lake Park, Village of North Palm Beach, City of Palm Beach Gardens, and unincorporated Palm Beach County
Seminole Improvement District	Special District	Unincorporated Palm Beach County, and City of Westlake
Tequesta, Village of	Local Government	Village of Tequesta, Town of Jupiter Inlet Colony, Town of Jupiter Island, and unincorporated Palm Beach and Martin[a] Counties
Tropical Breeze Estates	Privately Owned	Unincorporated Palm Beach County
Wellington, Village of	Local Government	Village of Royal Palm Beach, Village of Wellington, and unincorporated Palm Beach County
West Palm Beach Public Utilities, City of	Local Government	City of West Palm Beach, Town of Palm Beach, and Town of South Palm Beach

Utility/Entity Name	Utility Type	Local/Tribal Governments Served (Raw or Finished)
	Broward County	
Broward County Water and Wastewater Services District 1	Local Government	City of Fort Lauderdale, City of Lauderdale Lakes, City of Lauderhill, City of North Lauderdale, City of Oakland Park, City of Pembroke Park, City of Plantation, City of Pompano Beach, City of Tamarac, City of West Park, and unincorporated Broward County
Broward County Water and Wastewater Services District 2	Local Government	City of Coconut Creek[b] (Coconut Creek distributes to the City of Parkland and Seminole Tribe of Florida's Coconut Creek Trust Lands), City of Deerfield Beach, City of Lighthouse Point, City of Pompano Beach, and unincorporated Broward County
Broward County Water and Wastewater Services District 3	Local Government	City of Dania Beach, Town of Davie, City of Fort Lauderdale, City of West Park, City of Hollywood, City of Pembroke Park and unincorporated Broward County
Cooper City Utilities Department	Local Government	City of Cooper City and Town of Southwest Ranches
Coral Springs, City of	Local Government	City of Coral Springs
Coral Springs Improvement District	Special District	City of Coral Springs
Dania Beach, City of	Local Government	City of Dania Beach
Davie, Town of	Local Government	Town of Davie and Seminole Tribe of Florida's Hollywood Reservation (Hard Rock Casino)
Deerfield Beach, City of	Local Government	City of Deerfield Beach
Fort Lauderdale, City of	Local Government	Town of Davie, City of Fort Lauderdale, City of Hollywood, Town of Lauderdale-by-the-Sea, Village of Lazy Lake, City of Lauderhill, City of Oakland Park, Village of Sea Ranch Lakes, City of Tamarac, City of Wilton Manors, City of Lauderdale Lakes, and City of North Lauderdale
Hallandale Beach, City of	Local Government	City of Hallandale Beach
Hillsboro Beach, Town of	Local Government	Town of Hillsboro Beach
Hollywood, City of	Local Government	City of Hollywood, City of Dania Beach, Seminole Tribe of Florida's Hollywood Reservation, City of West Park, Town of Davie, City of Fort Lauderdale, and unincorporated Broward County
Lauderhill, City of	Local Government	City of Lauderhill
Margate, City of	Local Government	City of Margate and City of Coconut Creek
Miramar, City of	Local Government	City of Miramar and Broward County Water & Wastewater Services District 3
North Lauderdale, City of	Local Government	City of North Lauderdale
North Springs Improvement District	Special District	City of Parkland and City of Coral Springs
City of Oakland Park	Local Government	City of Oakland Park
Parkland Utilities, Inc.	Privately Owned	City of Parkland
Pembroke Pines, City of	Local Government	City of Pembroke Pines and Town of Southwest Ranches
Plantation, City of	Local Government	City of Plantation
Pompano Beach Utilities Department, City of	Local Government	City of Pompano Beach, City of Lighthouse Point, and Town of Lauderdale-By-The-Sea
Royal Utility Corporation	Privately Owned	City of Coral Springs
Seminole Tribe of Florida	Tribal Government	Seminole Tribe of Florida's Hollywood Reservation
Sunrise Utilities Department	Local Government	City of Sunrise, Town of Davie, Town of Southwest Ranches, City of Weston, and unincorporated Broward County
Tamarac, City of	Local Government	City of Tamarac, City of North Lauderdale
Tindall Hammock	Special District	Town of Davie

Utility/Entity Name	Utility Type	Local/Tribal Governments Served (Raw or Finished)
Miami-Dade County		
Americana Village	Privately Owned	Unincorporated Miami-Dade County
Florida City Water & Sewer Department	Local Government	City of Florida City
Homestead, City of	Local Government	City of Florida City, City of Homestead, and unincorporated Miami-Dade County
Miami-Dade Water and Sewer Department	Local Government	Retail: City of Aventura, City of Coral Gables, Town of Cutler Bay, City of Doral, Village of El Portal, Village of Key Biscayne, City of Miami Gardens, Town of Miami Lakes, Village of Miami Shores, City of Miami, City of Miami Springs, Village of Palmetto Bay, Village of Pinecrest, City of South Miami, City of Sweetwater, City of Florida City, unincorporated Miami-Dade County, and Miccosukee Tribe of Indians
		Wholesale: Village of Bal Harbour, Town of Bay Harbour Islands, City of Hialeah Gardens, City of Hialeah, City of Homestead (as needed), Village of Indian Creek, Town of Medley, City of Miami Beach, City of North Bay Village, City of North Miami, City of North Miami Beach (as needed) City of Opa-Locka, Town of Surfside, Village of Virginia Gardens, and City of West Miami
North Miami, City of	Local Government	City of North Miami (part wholesale purchase from Miami-Dade Water and Sewer District), Village of Biscayne Park, Village of Miami Shores, and unincorporated Miami-Dade County
North Miami Beach, City of	Local Government	City of North Miami Beach, City of Aventura (Retail), Town of Golden Beach (Retail), City of Miami Gardens (Retail), City of Sunny Isles Beach (Retail), and unincorporated Miami-Dade County (Wholesale and Retail)
City of Opa-Locka	Local Government	City of Opa-Locka, City of Aventura (Miami-Dade Water and Sewer District through City of Opa-Locka), and City of Miami Gardens (Miami-Dade Water and Sewer District through City of Opa-Locka)
Monroe County		
Florida Keys Aqueduct Authority	Special District	Islamorada, Village of Islands, City of Key Colony Beach, City of Key West, City of Layton, City of Marathon, and unincorporated Monroe County
Hendry County		
Seminole Tribe of Florida	Tribal Government	Seminole Tribe of Florida's Big Cypress Reservation

[a] Unincorporated Martin County is outside of the LEC Planning Area.
[b] Local government served through bulk water agreement.

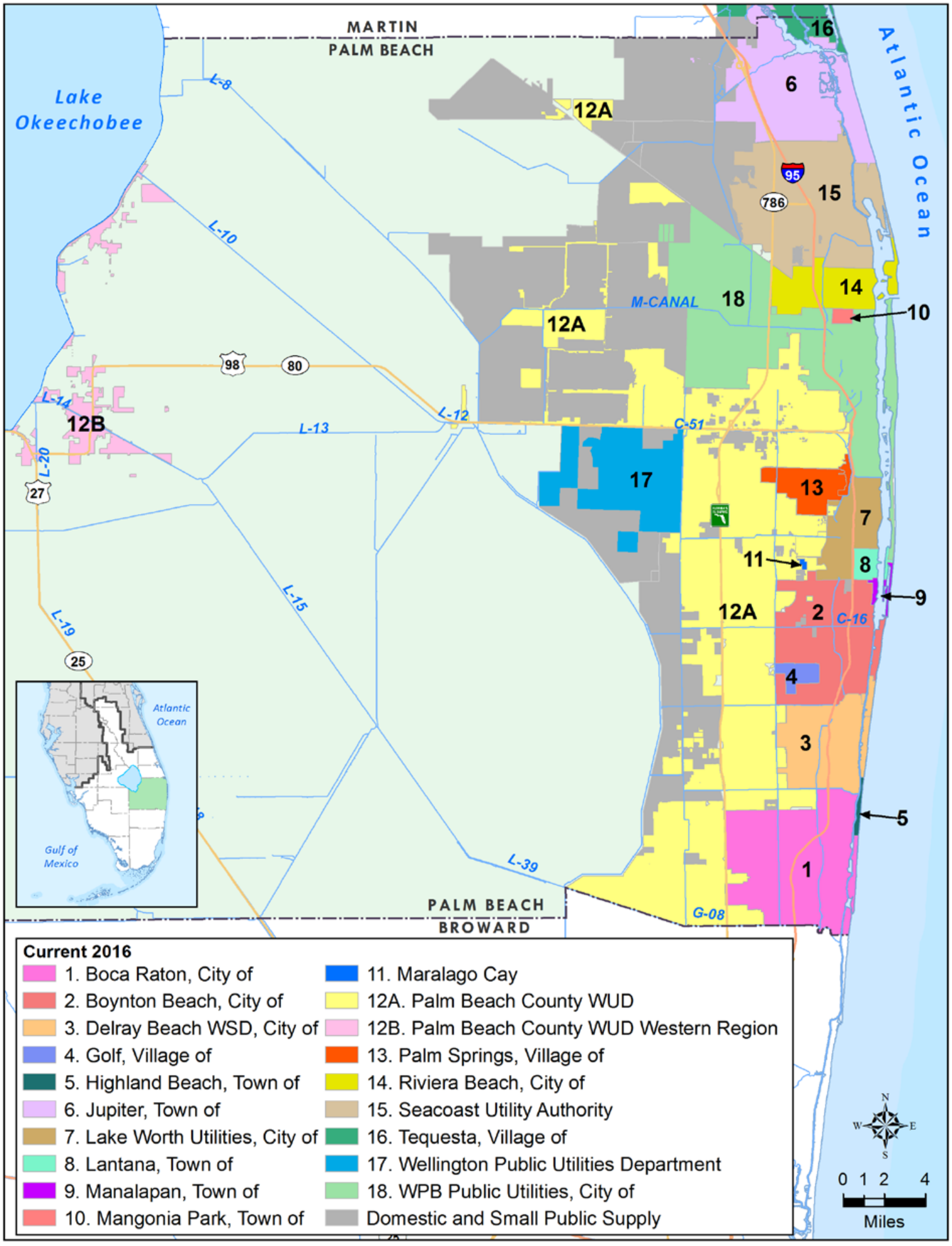

Figure A-1. Current (2016) public water supply utility service areas in Palm Beach County.

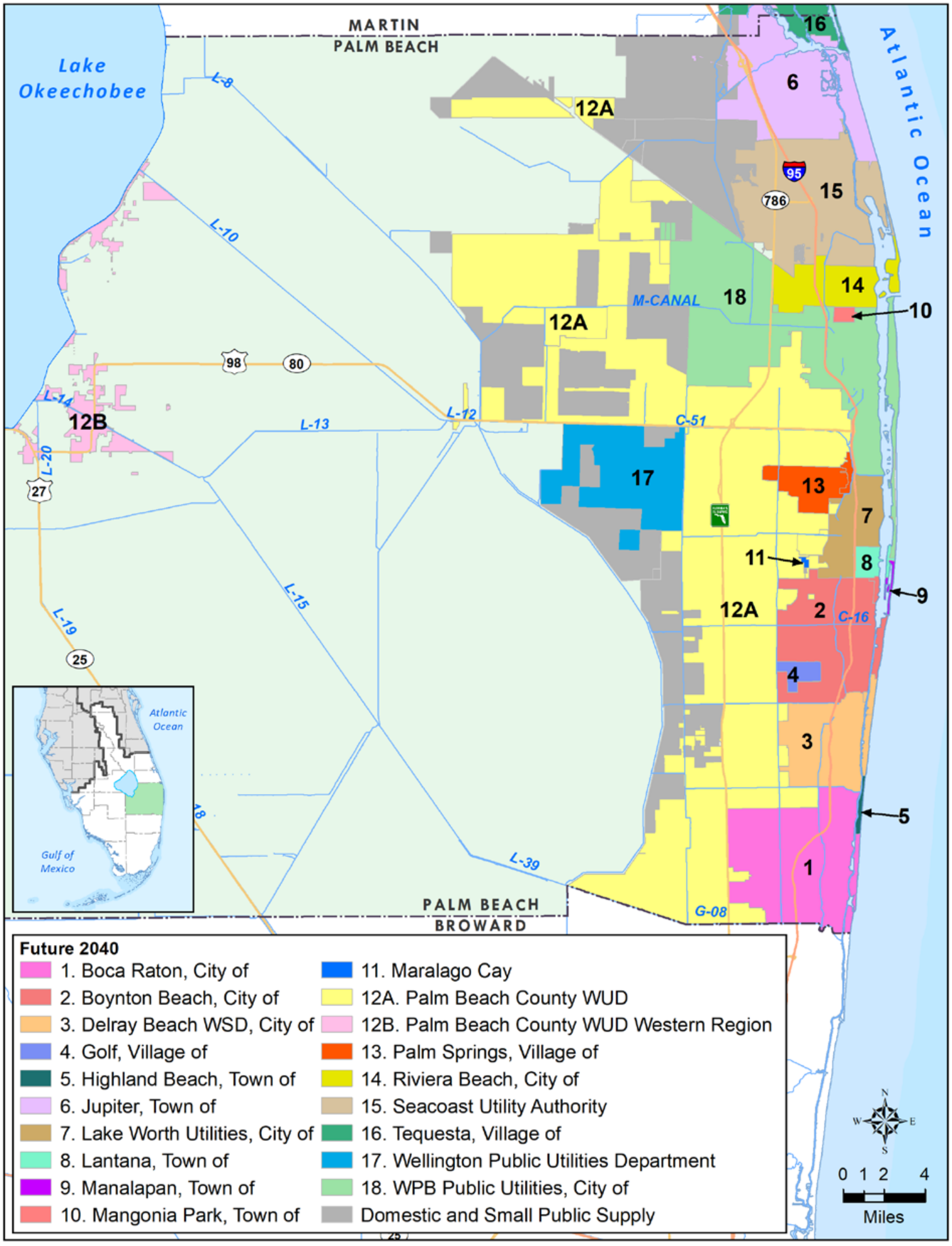

Figure A-2. Future (2040) public water supply utility service areas in Palm Beach County.

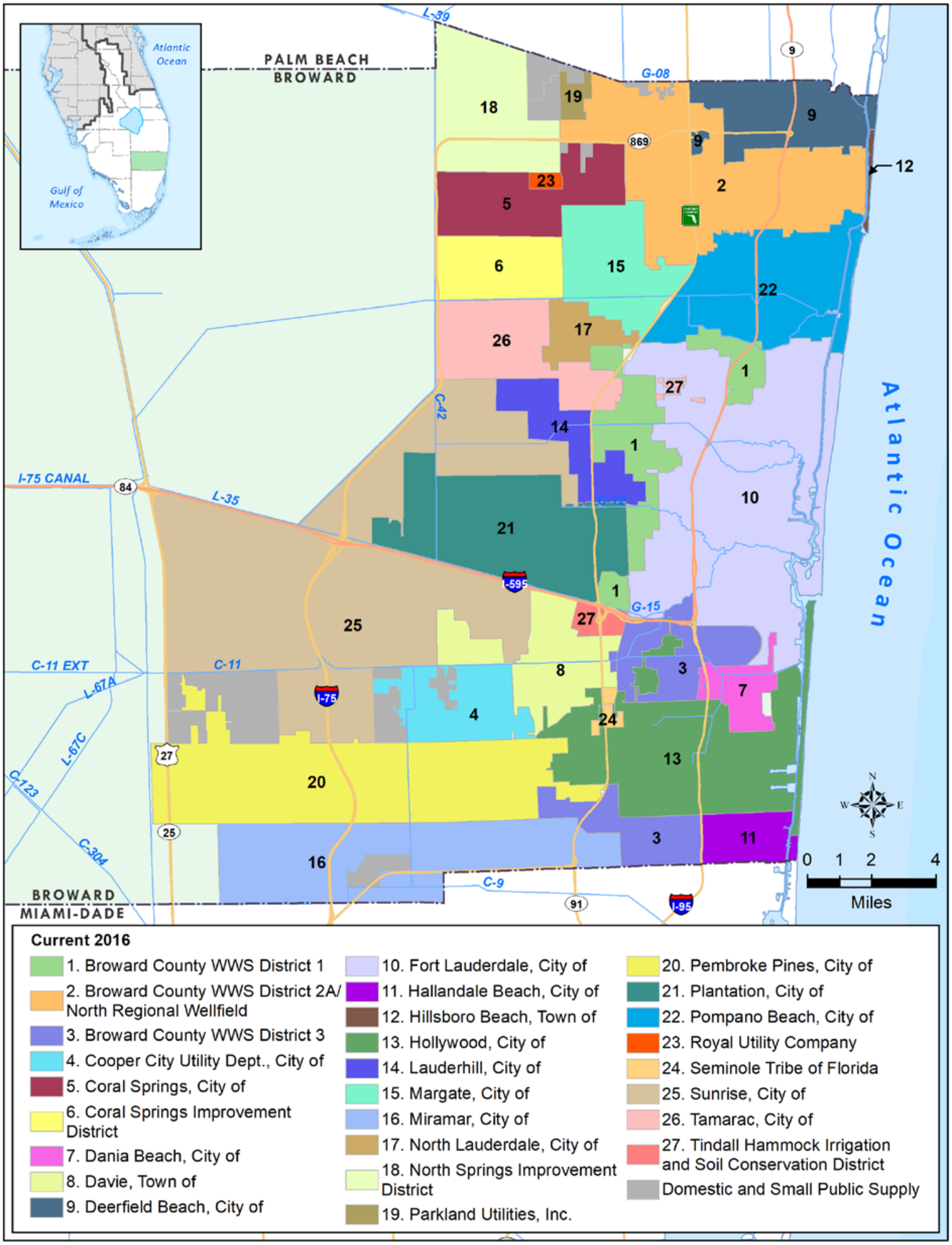

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Figure A-3. Current (2016) public water supply utility service areas in Broward County.

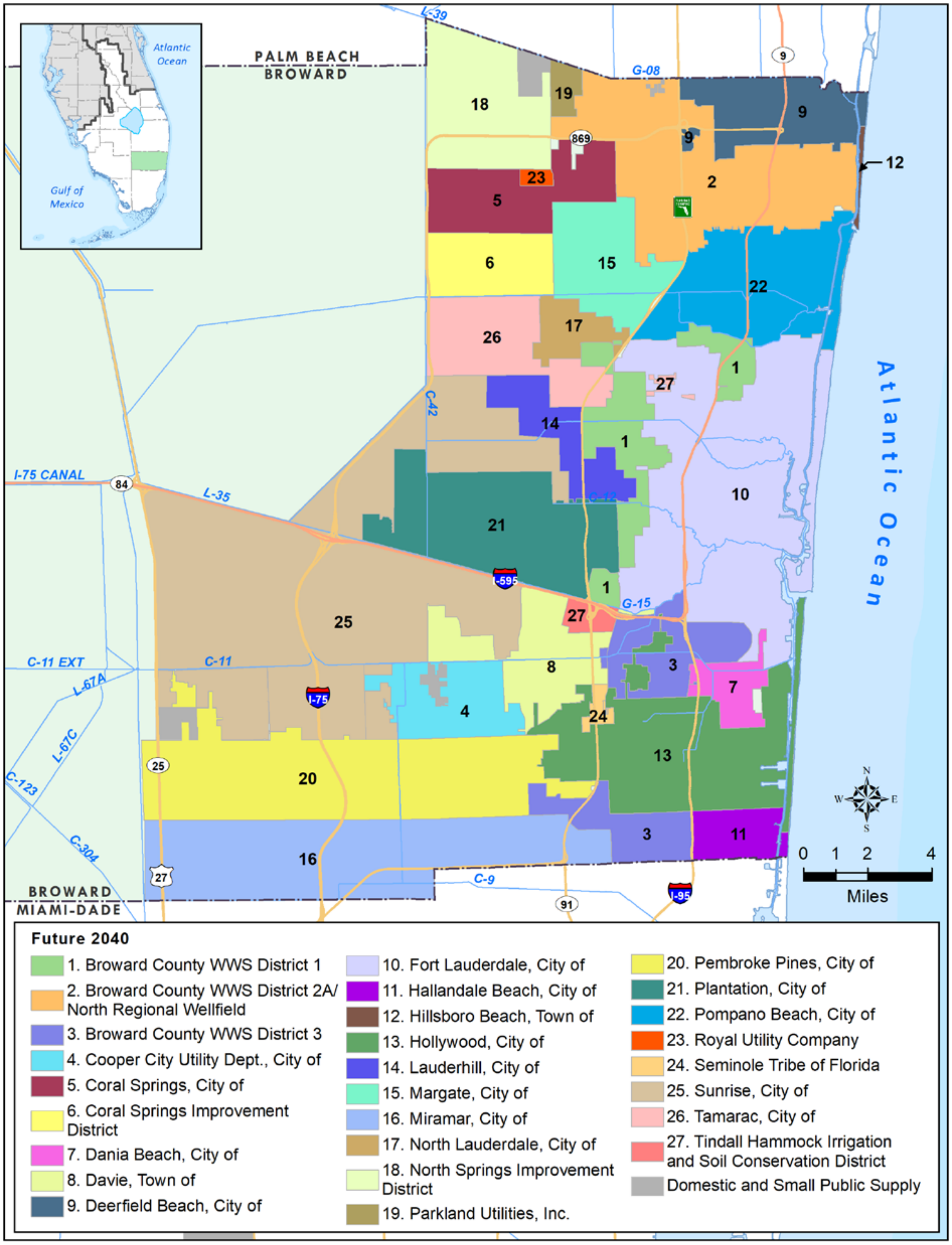

Figure A-4. Future (2040) public water supply utility service areas in Broward County.

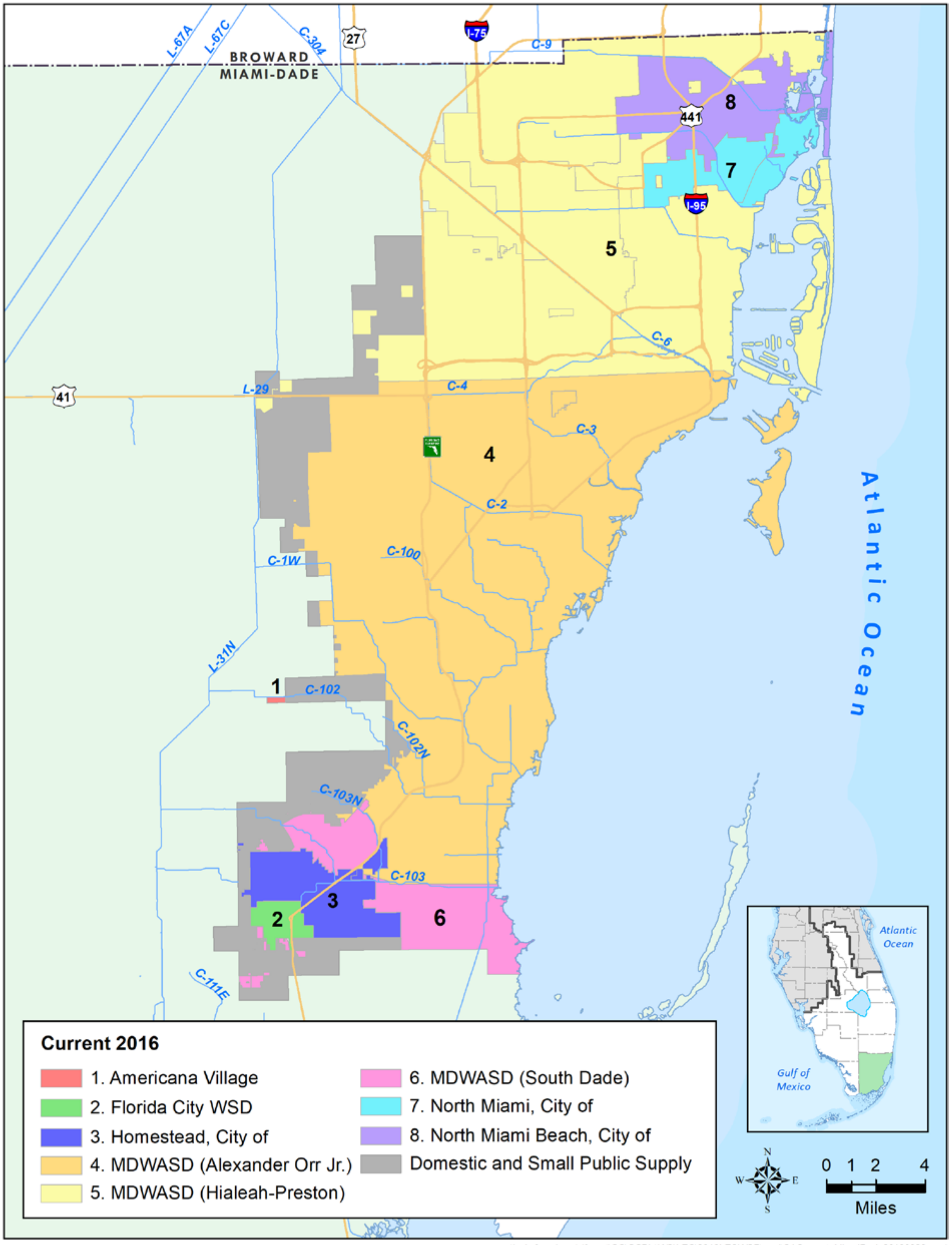

Figure A-5. Current (2016) public water supply utility service areas in Miami-Dade County.

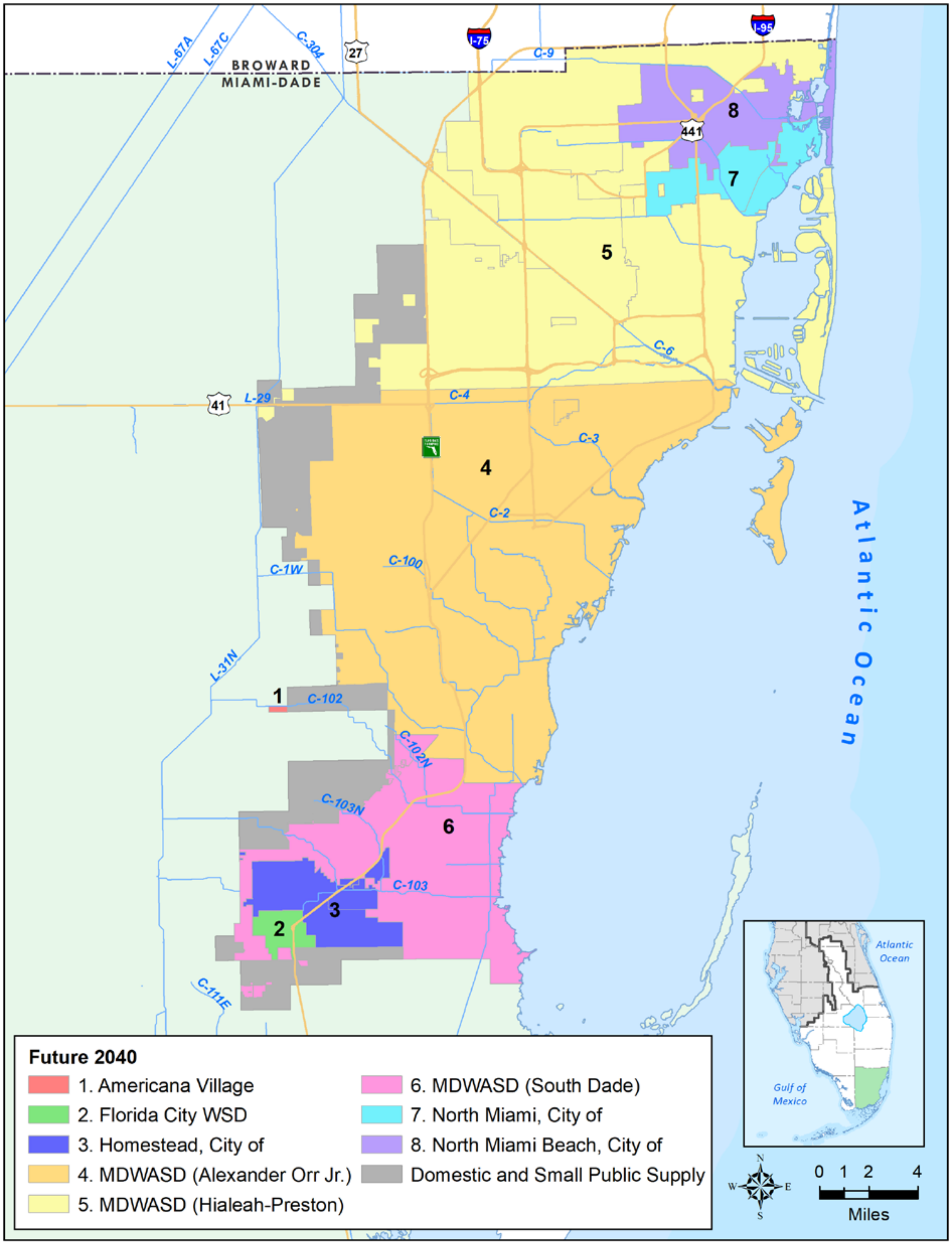

Figure A-6. Future (2040) public water supply utility service areas in Miami-Dade County.

B

Water Demand Projections

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The South Florida Water Management District (SFWMD or District) develops water demand projections in coordination with stakeholder groups, other agencies, utilities, and local governments. This appendix describes the methods used to develop water demand estimates for 2016 and projections to 2040 for the Lower East Coast (LEC) Planning Area.

Water demands for this *2018 Lower East Coast Water Supply Plan Update* (2018 LEC Plan Update) are estimated for the six water use categories listed below, which were established by the Florida Department of Environmental Protection (FDEP) in coordination with the state's water management districts. Section 373.709, Florida Statutes (F.S.), states the level-of-certainty planning goal associated with identifying water demands shall be based on meeting demands during 1-in-10 year drought conditions for at least a 20-year period. Therefore, water demand estimates and projections are provided in 5-year increments to 2040 for average rainfall and 1-in-10 year drought conditions. In addition, demands are described and analyzed in two ways: gross (or raw) demand and net (or finished) demand.

- **Public Water Supply (PWS)** – Potable water supplied by water treatment plants with average gross (raw) pumpage of 0.10 million gallons per day (mgd) or greater.
- **Domestic and Small Public Supply (DSS)** – Potable water used by households served by small utilities (less than 0.10 mgd) or self-supplied by private wells.
- **Agricultural Irrigation (AGR)** – Self-supplied water used for commercial crop irrigation, greenhouses, nurseries, livestock watering, pasture, and aquaculture.
- **Recreational/Landscape Irrigation (REC)** – Self-supplied and reclaimed water used to irrigate golf courses, sports fields, parks, cemeteries, and large common areas such as land managed by homeowners' associations and commercial developments.
- **Industrial/Commercial/Institutional (ICI)** – Self-supplied water associated with the production of goods or provision of services by industrial, commercial, or institutional establishments.
- **Power Generation (PWR)** – Self-supplied and reclaimed water used for cooling, potable, and process water by power generation facilities.

POPULATION ESTIMATES AND PROJECTIONS

This section presents the methodology used to develop the 2016 population estimates and 2040 population projections for the LEC Planning Area, which are essential to determining water demands for all six water use categories. While the University of Florida's Bureau of Economic and Business Research (BEBR) provides population estimates and projections at the county level, water supply planning requires projections at the sub-county level to delineate domestic self-supply and utility service areas for DSS and PWS demands. Section 373.709(2)(a)1, F.S., prescribes the use of population projections in determining water supply needs in regional water supply plans, as follows:

> *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.*

Permanent resident estimates and projections for each county, published by BEBR (Rayer and Wang 2017), were used as the basis of population projections in this 2018 LEC Plan Update, in accordance with Section 373.709(2)(a)1, F.S. Adjustments were made to include only the portion of Hendry County within the planning area. The LEC Planning Area also includes unpopulated portions of Collier County within the Big Cypress Basin. The 2016 permanent resident populations within the LEC Planning Area were as follows:

- Palm Beach County: 1,391,739 permanent residents
- Broward County: 1,854,514 permanent residents
- Miami-Dade County: 2,700,794 permanent residents
- Monroe County: 76,047 permanent residents
- Hendry County: 4,096 permanent residents

Utility Service Areas

To establish current and future PWS and DSS populations, each PWS utility's 2016 and 2040 potable water service area was delineated. A utility service area refers to the area with water distribution infrastructure and water customers served by a particular PWS utility. The SFWMD developed 2016 and 2040 utility service area maps with updated county coverages from Palm Beach County Water Utilities Department, Broward County Water and Wastewater Services, and Miami-Dade Water and Sewer Department (**Appendix A**). Accuracy of the service area maps was verified through correspondence with PWS utilities.

Population Projection Methodology

Census block populations from the 2010 United States Census (United States Census Bureau 2012) and 2016 PWS service area maps were used to estimate the 2016 permanent resident populations for PWS utilities and DSS areas. Each census block within the LEC Planning Area was assigned to a PWS service area or a DSS area. The distribution of population in census blocks not entirely within a single PWS service area or DSS area was based on visual comparison of residential land use coverage. PWS service area and DSS area population estimates for 2012 through 2016 were calculated by adjusting the 2010 census baseline estimates. These adjustments were made such that the PWS to DSS ratio of 2010 county total populations was maintained and the total population for each county matched BEBR's medium county estimates.

Projections of permanent resident populations for PWS utilities and DSS areas in Palm Beach, Broward, and Miami-Dade counties are based primarily on sub-county projections published by county planning departments. With each update of these projections, the latest BEBR medium county projection (or a projection from an alternative source) is divided into hundreds of traffic analysis zones (TAZs). Local Comprehensive Plans, transportation infrastructure, remaining developable land, and employment opportunities driven by local development objectives are factors considered by local planning departments to establish population growth rates for different areas within a county.

Group quarters, as defined by the United States Census, include correctional facilities, nursing homes, college dorms, military barracks, group homes, missions, and shelters. Population estimates for group quarters were included in TAZ projections provided by Palm Beach County, but they were not provided by Miami-Dade County or Broward County. SFWMD staff added group quarters populations to the projection data sets for Miami-Dade and Broward counties with the assumption that those populations will grow at the countywide population growth rate.

The population associated with TAZs completely contained within a PWS service area or DSS area accounted for approximately 94 percent of the LEC Planning Area's projected 2040 population. The remaining 6 percent were located in TAZs that intersected two or more PWS or DSS areas. Populations for the intersected TAZs were divided among the service areas using calculated population densities within areas designated for residential land use identified in future land use maps. New residents for a given TAZ were divided among intersecting service areas such that new population was added to the area(s) with the lowest population density first. If multiple intersecting areas reached a point where their population densities were the same, population was allocated evenly across intersecting areas so the 2040 population densities are the same. This approach produces a convergence in population density and allows for population growth to occur first in areas with available developable residential land.

After distributing the projected TAZ populations to all PWS service areas and DSS areas, the 2040 county population totals were less than BEBR's totals (Rayer and Wang 2017) by 16,133 (Palm Beach County), 96,486 (Broward County), and 213,186 (Miami-Dade County) permanent residents. These discrepancies are a result of inconsistency in the publication date and the source data used for the TAZ projections developed by local planning departments. The final step in developing population projections for these counties was to adjust PWS service area and DSS population totals so the county-calculated totals equaled the BEBR county totals. Adjustments to PWS service area and DSS population totals were made proportional to their unadjusted 2040 share of the total county population.

Distributing the projected population by PWS utility and DSS area for Monroe and Hendry counties was a straightforward process. Because the entire permanent resident population of Monroe County is served by the Florida Keys Aqueduct Authority, the utility population equals the BEBR county projections. In Hendry County, the portion of the county within the LEC Planning Area includes the PWS service area population for the Seminole Tribe of Florida Big Cypress Reservation. The remainder of the county population was categorized as DSS.

Urban Development in Miami

Population Projection Results

Table B-1 provides the results of the population distributions by county and PWS utility from 2016 to 2040. The results were shared with and reviewed by utility, municipal, and local government staff. Feedback from local stakeholders produced information that led to minor adjustments to some service area population projections.

Table B-1. Service area population projections in the LEC Planning Area.

County	PWS Utility or DSS	2016	2020	2025	2030	2035	2040
Palm Beach	Boca Raton, City of	113,040	117,109	121,510	124,630	127,163	129,336
	Boynton Beach, City of	107,646	113,090	121,542	126,509	130,858	134,809
	Delray Beach WSD, City of	67,272	70,520	74,188	77,079	79,597	81,874
	Golf, Village of	2,904	2,967	3,028	3,056	3,071	3,077
	Highland Beach, Town of	3,828	3,911	3,992	4,030	4,049	4,058
	Jupiter, Town of	72,984	75,871	79,042	81,381	83,334	85,047
	Lake Worth Utilities, City of	47,397	49,608	52,093	54,033	55,712	57,225
	Lantana, Town of	10,943	11,215	11,485	11,634	11,730	11,795
	Manalapan, Town of	2,552	2,626	432	446	463	478
	Mangonia Park, Town of	1,990	2,156	2,354	2,527	2,687	2,837
	Maralago Cay	1,063	1,093	1,124	1,142	1,156	1,167
	PBCWUD	498,848	534,857	577,172	613,513	646,757	677,834
	PBCWUD Western Region	34,886	36,137	37,489	38,446	39,222	39,888
	Palm Springs, Village of	47,899	50,206	52,810	54,860	56,645	58,260
	Riviera Beach, City of	39,805	42,467	45,576	48,212	50,606	52,835
	Seacoast Utility Authority	90,703	94,330	98,320	101,276	103,751	105,926
	Tequesta, Village of	8,668	8,866	9,059	9,155	9,210	9,241
	Wellington Public Utilities Department	55,587	57,640	59,869	61,468	62,777	63,908
	West Palm Beach Public Utilities, City of	115,088	121,366	128,554	134,399	139,587	144,341
	PWS Total	**1,323,103**	**1,396,035**	**1,479,639**	**1,547,796**	**1,608,375**	**1,663,936**
	DSS Total	**68,636**	**69,865**	**70,962**	**71,304**	**71,324**	**71,165**
	Palm Beach County Total	**1,391,739**	**1,465,900**	**1,550,601**	**1,619,100**	**1,679,699**	**1,735,101**
Broward	BCWWS District 1	81,380	85,750	90,782	94,977	98,552	101,686
	BCWWS District 2A/NR Wellfield	118,161	121,697	125,441	128,006	129,762	130,991
	Cooper City Utility Department, City of	30,449	31,401	32,419	33,131	33,634	34,000
	Coral Springs, City of	61,565	64,733	68,365	71,365	73,901	76,109
	CSID	39,222	40,008	40,760	41,125	41,233	41,183
	Dania Beach, City of	16,520	18,316	20,490	22,484	24,321	26,033
	Davie, Town of	29,833	33,204	37,294	41,055	44,530	47,772
	Deerfield Beach, City of	53,069	56,340	60,156	63,422	66,269	68,811
	Fort Lauderdale, City of	223,112	240,549	261,271	279,628	296,108	311,157
	Hallandale Beach, City of	39,375	41,021	42,862	44,304	45,461	46,424
	Hillsboro Beach, Town of	1,989	2,054	2,125	2,175	2,211	2,239
	Hollywood, City of*	197,845	207,322	218,103	226,864	234,155	240,420
	Lauderhill, City of	61,857	63,931	66,174	67,797	68,989	69,896
	Margate, City of	61,868	64,790	68,108	70,796	73,025	74,936
	Miramar, City of	122,845	128,105	134,007	138,662	142,425	145,576
	North Lauderdale, City of	35,460	36,688	38,024	39,003	39,735	40,301
	NSID	36,879	38,817	41,043	42,891	44,459	45,829
	Parkland Utilities, Inc.	2,277	2,526	2,827	3,104	3,359	3,597
	Pembroke Pines, City of	161,337	164,152	166,709	167,682	167,615	166,913
	Plantation, City of	89,674	93,283	97,299	100,408	102,872	104,900
	Pompano Beach, City of	84,524	91,552	99,937	107,422	114,181	120,381
	Royal Utility Corporation	3,431	3,520	3,611	3,669	3,703	3,722
	Seminole Tribe of Florida (Hollywood)	1,258	1,635	2,106	2,559	2,993	3,407
	Sunrise, City of	224,042	231,288	239,075	244,619	248,611	251,584
	Tamarac, City of	63,379	65,315	67,374	68,800	69,791	70,498
	Tindall Hammock ISCD	2,823	3,060	3,342	3,595	3,823	4,032
	PWS Total	**1,844,174**	**1,931,057**	**2,029,704**	**2,109,543**	**2,175,718**	**2,232,397**
	DSS Total	**10,340**	**9,644**	**8,697**	**7,659**	**6,583**	**5,502**
	Broward County Total	**1,854,514**	**1,940,701**	**2,038,401**	**2,117,202**	**2,182,301**	**2,237,899**

County	PWS Utility or DSS	2016	2020	2025	2030	2035	2040
Miami-Dade	Americana Village	1,583	1,583	1,583	1,583	1,583	1,583
	Florida City WSD	12,172	14,492	17,350	20,127	22,787	25,340
	Homestead, City of	68,939	75,072	82,416	89,345	95,784	101,838
	MDWASD	2,351,064	2,487,983	2,647,294	2,792,869	2,923,543	3,043,340
	North Miami, City of	75,725	76,714	77,528	77,921	77,918	77,672
	North Miami Beach, City of	169,946	178,852	189,117	198,396	206,621	214,092
	PWS Total	**2,679,429**	**2,834,696**	**3,015,288**	**3,180,241**	**3,328,236**	**3,463,865**
	DSS Total	**21,365**	**26,705**	**33,311**	**39,760**	**45,963**	**51,935**
	Miami-Dade County Total	**2,700,794**	**2,861,401**	**3,048,599**	**3,220,001**	**3,374,199**	**3,515,800**
Monroe	FKAA	76,047	76,200	76,500	76,900	77,200	77,100
	PWS Total	**76,047**	**76,200**	**76,500**	**76,900**	**77,200**	**77,100**
	DSS Total	**0**	**0**	**0**	**0**	**0**	**0**
	Monroe County Total	**76,047**	**76,200**	**76,500**	**76,900**	**77,200**	**77,100**
Hendry**	Seminole Tribe of Florida (Big Cypress)	529	519	527	542	549	556
	PWS Total	**529**	**519**	**527**	**542**	**549**	**556**
	DSS Total	**3,567**	**3,665**	**3,753**	**3,792**	**3,838**	**3,895**
	Hendry County Total	**4,096**	**4,185**	**4,280**	**4,334**	**4,387**	**4,451**
	LEC Planning Area PWS Total	**5,923,282**	**6,238,507**	**6,601,658**	**6,915,022**	**7,190,078**	**7,437,854**
	LEC Planning Area DSS Total	**103,908**	**109,879**	**116,723**	**122,515**	**127,708**	**132,497**
	LEC Planning Area Total	**6,027,190**	**6,348,386**	**6,718,381**	**7,037,537**	**7,317,786**	**7,570,351**

BCWWS = Broward County Water and Wastewater Services; CSID = Coral Springs Improvement District; DSS = Domestic and Small Public Supply; FKAA = Florida Keys Aqueduct Authority; ISCD = Irrigation and Soil Conservation District; LEC = Lower East Coast; MDWASD = Miami-Dade Water and Sewer Department; NR = North Regional; NSID = North Springs Improvement District; PBCWUD = Palm Beach County Water Utilities Department; PWS = Public Water Supply; WSD = Water and Sewer Department.

* BCWWS District 3 population is included.

** Populations listed for Hendry County are only for the areas within the LEC Planning Area boundaries.

The results shown in **Table B-1** indicate the LEC Planning Area will contain more than 1.54 million additional permanent residents by 2040, an increase of approximately 25 percent. Growth rates in Palm Beach, Broward, and Miami-Dade counties are projected to gradually decline through 2040. The utilities with the largest populations served, both in 2016 and 2040, are the Miami-Dade Water and Sewer Department, Palm Beach County Water Utilities Department, and City of Fort Lauderdale, which collectively account for 54 percent of the region's 2040 PWS population. Some PWS utilities are expected to expand their service areas by connecting DSS households and including them in the broader PWS customer base. However, a substantial DSS population (more than 130,000 residents), mainly in Palm Beach and Miami-Dade counties, is expected to remain in 2040.

Comparing this 2018 LEC Plan Update population projection to those published in the 2013 and 2006 plan updates can provide insight into the importance of population growth rates based on BEBR medium projections. Prior to the national economic downturn in 2008, high rates of development in the region pointed to substantial population growth (**Figure B-1**). The population projections in the 2006 LEC Plan Update were a result of the higher population growth rates prior to the recession. The BEBR medium projections used in this 2018 LEC Plan Update and in the 2013 LEC Plan Update share a more consistent view of future population based on estimates of slower growth rates following the 2008 recession.

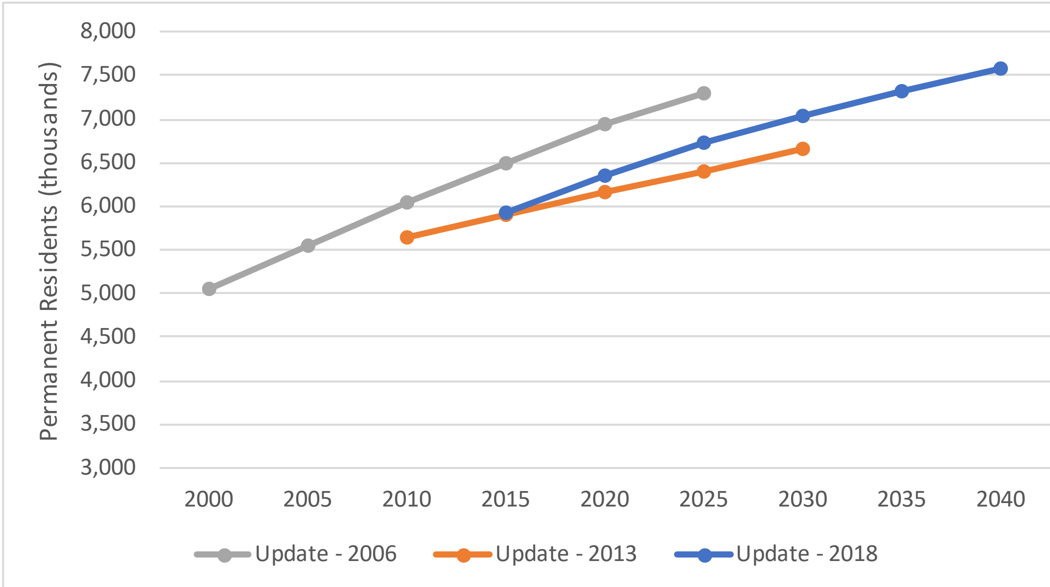

Figure B-1. Comparison of population projections from the 2006, 2013, and 2018 LEC water supply plan updates.

PUBLIC WATER SUPPLY

The PWS category includes potable water supplied by water treatment plants with projected average gross (raw) pumpage of 0.10 mgd or greater. Developing PWS demand projections in the LEC Planning Area was a multistep process that included determining utility service area and DSS populations, calculating per capita use rates (PCURs), and projecting future water needs.

NOTE

Perceived discrepancies in table totals are due to rounding.

PWS Projection Methodology

Per Capita Use Rates

A net (finished) water PCUR was developed for each PWS utility by dividing the annual net (finished) water volume for 2012 through 2016 by the corresponding service area populations (permanent residents) for each year; then, the five annual PCURs were averaged (**Table B-2**). Net (finished) water volumes for 2012 through 2016 were obtained from the PWS utility monthly operating reports submitted to the FDEP. The net (finished) water volume reported to the FDEP includes all water produced for permanent and seasonal residents; industrial, landscaping, and irrigation water supplied by PWS utilities; and any water distribution losses. The resulting PCURs conform to guidance provided by the FDEP for consistent statewide water supply planning. Future water conservation savings were not factored into demand projections and PCURs due to water savings uncertainty. The LEC Planning Area county average PCURs were calculated by averaging PWS and DSS PCURs, weighted by their respective permanent resident populations.

Table B-2. Average net (finished) water per capita use rates (in gallons per capita per day) in the LEC Planning Area.

County	PWS Utility or DSS	2012-2016 Average PCUR
Palm Beach	Boca Raton, City of	299
	Boynton Beach, City of	119
	Delray Beach WSD, City of	229
	Golf, Village of	151
	Highland Beach	334
	Jupiter, Town of	215
	Lake Worth Utilities, City of	107
	Lantana, Town of	175
	Manalapan, Town of	442
	Mangonia Park, Town of	176
	Maralago Cay	225
	PBCWUD	111
	PBCWUD Western Region	157
	Palm Springs, Village of	81
	Riviera Beach, City of	184
	Seacoast Utility Authority	191
	Tequesta, Village of	309
	Wellington Public Utilities Dept.	107
	West Palm Beach Public Utilities, City of	243
	Palm Beach County DSS	111
	Palm Beach County Average	**162**
Broward	BCWWS District 1	92
	BCWWS 2A/NR Wellfield	106
	Cooper City Utility Dept., City of	104
	Coral Springs, City of	101
	CSID	109
	Dania Beach, City of	119
	Davie, Town of	143
	Deerfield Beach, City of	185
	Fort Lauderdale, City of	170
	Hallandale Beach, City of	148
	Hillsboro Beach, Town of	327
	Hollywood, City of	112
	Lauderhill, City of	98
	Margate, City of	110
	Miramar, City of	104
	North Lauderdale, City of	80
	NSID	113
	Parkland Utilities, Inc.	103
	Pembroke Pines, City of	79
	Plantation, City of	114
	Pompano Beach, City of	159
	Royal Utility Company	106
	Seminole Tribe of Florida (Hollywood)	174
	Sunrise, City of	98
	Tamarac, City of	98
	Tindall Hammock ISCD	129
	Broward County DSS	98
	Broward County Average	**120**

County	PWS Utility or DSS	2012-2016 Average PCUR
Miami-Dade	Americana Village	142
	Florida City WSD	167
	Homestead, City of	156
	MDWASD	133
	North Miami, City of	102
	North Miami Beach, City of	116
	Miami-Dade County DSS	133
	Miami-Dade County Average	**138**
Monroe	FKAA	231
	Monroe County Average	**231**
Hendry*	Seminole Tribe of Florida (Big Cypress)	234
	Hendry County DSS	106
	Hendry County Average**	**107**
	LEC Planning Area Average	**136**

BCWWS = Broward County Water and Wastewater Services; CSID = Coral Springs Improvement District; DSS = Domestic and Small Public Supply; FKAA = Florida Keys Aqueduct Authority; ISCD = Irrigation and Soil Conservation District; LEC = Lower East Coast; MDWASD = Miami-Dade Water and Sewer Department; NR = North Regional; NSID = North Springs Improvement District; PBCWUD = Palm Beach County Water Utilities Department; PCUR = per capita use rate; PWS = Public Water Supply; WSD = Water and Sewer Department.
* Values listed for Hendry county are only for the areas within the LEC Planning Area boundaries.
** DSS and average PCUR from the *2017 Lower West Coast Water Supply Plan Update* (SFWMD 2017a).

Finished to Raw Water Conversion

Net (finished) demands (**Table B-3**) were calculated by multiplying the PWS service area or DSS area population and the 5-year average PCUR. Gross (raw) water withdrawals are the volumes needed from the water source(s) to produce the required net (finished) water volumes considering water treatment process losses. Water use permit allocations are based on the gross (raw) water volume to meet service area demands. To determine gross (raw) water demand for each PWS utility, net (finished) water projections were multiplied by raw-to-finished ratios (**Table B-4**), which are based on the treatment efficiency of each PWS treatment plant. For example, if a typical reverse osmosis treatment facility withdraws a gross (raw) volume of 10 mgd and produces 8 mgd of net (finished) water, its treatment losses are 20 percent. Therefore, its raw-to-finished ratio would be 1.25 (10 mgd divided by 8 mgd).

Treatment efficiencies were determined from information supplied in the water use permit and/or standard treatment process technical documents. The assumed losses are 0 percent for chlorination, 3 percent for lime softening, 15 percent for nanofiltration, and 25 percent for reverse osmosis. If a utility has more than one treatment method, the ratio reflects combined treatment efficiencies. No changes in treatment efficiency were assumed for 2016 through 2035 from any potential water treatment process changes (e.g., lime softening to membrane), although some PWS utilities are projected to increase their use of the Floridan aquifer system or change their treatment process. Because the timing of treatment efficiency changes is uncertain, different raw-to-finished ratios were used to calculate the 2040 raw water demand for Broward County Water and Wastewater Services District 2A/North Regional Wellfield, the City of Fort Lauderdale, the City of Hallandale, the City of Lauderhill, and Miami-Dade Water and Sewer Department. Potable water treatment plants in Palm Beach, Broward and Miami-Dade counties and their treatment processes are shown in **Figures B-2** to **B-4**.

Table B-3. PWS net (finished) water demands under average rainfall conditions in the LEC Planning Area.

County	PWS Utility	Demand - Average Rainfall Conditions (mgd)					
		2016	2020	2025	2030	2035	2040
Palm Beach	Boca Raton, City of	33.80	35.02	36.33	37.26	38.02	38.67
	Boynton Beach, City of	12.81	13.46	14.46	15.05	15.57	16.04
	Delray Beach WSD, City of	15.41	16.15	16.99	17.65	18.23	18.75
	Golf, Village of	0.44	0.45	0.46	0.46	0.46	0.46
	Highland Beach, Town of	1.28	1.31	1.33	1.35	1.35	1.36
	Jupiter, Town of	15.69	16.31	16.99	17.50	17.92	18.29
	Lake Worth Utilities, City of	5.07	5.31	5.57	5.78	5.96	6.12
	Lantana, Town of	1.92	1.96	2.01	2.04	2.05	2.06
	Manalapan, Town of	1.13	1.16	0.89	0.91	0.95	0.98
	Mangonia Park, Town of	0.35	0.38	0.41	0.44	0.47	0.50
	Maralago Cay	0.24	0.25	0.25	0.26	0.26	0.26
	PBCWUD	55.37	59.37	64.07	68.10	71.79	75.24
	PBCWUD Western Region	5.48	5.67	5.89	6.04	6.16	6.26
	Palm Springs, Village of	3.88	4.07	4.28	4.44	4.59	4.72
	Riviera Beach, City of	7.32	7.81	8.39	8.87	9.31	9.72
	Seacoast Utility Authority	17.32	18.02	18.78	19.34	19.82	20.23
	Tequesta, Village of	2.68	2.74	2.80	2.83	2.85	2.86
	Wellington Public Utilities Department	5.95	6.17	6.41	6.58	6.72	6.84
	West Palm Beach Public Utilities, City of	27.97	29.49	31.24	32.66	33.92	35.07
	Palm Beach County Total	**214.10**	**225.08**	**237.54**	**247.57**	**256.40**	**264.44**
Broward	BCWWS District 1	7.49	7.89	8.35	8.74	9.07	9.36
	BCWWS District 2A/NR Wellfield	12.53	12.90	13.30	13.57	13.75	13.89
	Cooper City Utility Department, City of	3.17	3.27	3.37	3.45	3.50	3.54
	Coral Springs, City of	6.22	6.54	6.90	7.21	7.46	7.69
	CSID	4.28	4.36	4.44	4.48	4.49	4.49
	Dania Beach, City of	1.97	2.18	2.44	2.68	2.89	3.10
	Davie, Town of	4.27	4.75	5.33	5.87	6.37	6.83
	Deerfield Beach, City of	9.82	10.42	11.13	11.73	12.26	12.73
	Fort Lauderdale, City of	37.93	40.89	44.42	47.54	50.34	52.90
	Hallandale Beach, City of	5.83	6.07	6.34	6.56	6.73	6.87
	Hillsboro Beach, Town of	0.65	0.67	0.69	0.71	0.72	0.73
	Hollywood, City of	22.16	23.22	24.43	25.41	26.23	26.93
	Lauderhill, City of	6.06	6.27	6.49	6.64	6.76	6.85
	Margate, City of	6.81	7.13	7.49	7.79	8.03	8.24
	Miramar, City of	12.78	13.32	13.94	14.42	14.81	15.14
	North Lauderdale, City of	2.84	2.94	3.04	3.12	3.18	3.22
	NSID	4.17	4.39	4.64	4.85	5.02	5.18
	Parkland Utilities, Inc.	0.23	0.26	0.29	0.32	0.35	0.37
	Pembroke Pines, City of	12.75	12.97	13.17	13.25	13.24	13.19
	Plantation, City of	10.22	10.63	11.09	11.45	11.73	11.96
	Pompano Beach, City of	13.44	14.56	15.89	17.08	18.15	19.14
	Royal Utility Corporation	0.36	0.37	0.38	0.39	0.39	0.39
	Seminole Tribe of Florida (Hollywood)	0.22	0.28	0.37	0.45	0.52	0.59
	Sunrise, City of	21.96	22.67	23.43	23.97	24.36	24.66
	Tamarac, City of	6.21	6.40	6.60	6.74	6.84	6.91
	Tindall Hammock ISCD	0.36	0.39	0.43	0.46	0.49	0.52
	Broward County Total	**214.69**	**225.74**	**238.40**	**248.86**	**257.70**	**265.40**

County	PWS Utility	Demand - Average Rainfall Conditions (mgd)					
		2016	2020	2025	2030	2035	2040
Miami-Dade	Americana Village	0.22	0.22	0.22	0.22	0.22	0.22
	Florida City WSD	2.03	2.42	2.90	3.36	3.81	4.23
	Homestead, City of	10.75	11.71	12.86	13.94	14.94	15.89
	MDWASD	315.69	338.12	358.01	376.07	392.15	406.78
	North Miami, City of	7.72	7.82	7.91	7.95	7.95	7.92
	North Miami Beach, City of	19.71	20.75	21.94	23.01	23.97	24.83
	Miami-Dade County Total	**356.14**	**381.05**	**403.83**	**424.56**	**443.04**	**459.88**
Monroe	FKAA	17.57	17.60	17.67	17.76	17.83	17.81
	Monroe County Total	**17.57**	**17.60**	**17.67**	**17.76**	**17.83**	**17.81**
Hendry*	Seminole Tribe of Florida (Big Cypress)	0.12	0.12	0.12	0.13	0.13	0.13
	Hendry County Total	**0.12**	**0.12**	**0.12**	**0.13**	**0.13**	**0.13**
LEC Planning Area PWS Total		**802.62**	**849.59**	**897.57**	**938.88**	**975.10**	**1,007.66**

BCWWS = Broward County Water and Wastewater Services; CSID = Coral Springs Improvement District; FKAA = Florida Keys Aqueduct Authority; ISCD = Irrigation and Soil Conservation District; LEC = Lower East Coast; MDWASD = Miami-Dade Water and Sewer Department; mgd = million gallons per day; NR = North Regional; NSID = North Springs Improvement District; PBCWUD = Palm Beach County Water Utilities Department; PWS = Public Water Supply; WSD = Water and Sewer Department.

* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Table B-4. Raw-to-finished water adjustment ratios for PWS utilities in the LEC Planning Area.

County	PWS Utility	Raw-to-Finished Ratio
Palm Beach	Boca Raton, City of	1.13
	Boynton Beach, City of	1.10
	Delray Beach WSD, City of	1.03
	Golf, Village of	1.18
	Highland Beach	1.33
	Jupiter, Town of	1.25
	Lake Worth Utilities, City of	1.13
	Lantana, Town of	1.18
	Manalapan, Town of	1.33
	Mangonia Park, Town of	1.03
	Maralago Cay	1.03
	PBCWUD	1.11
	PBCWUD Western Region	1.33
	Palm Springs, Village of	1.05
	Riviera Beach, City of	1.03
	Seacoast Utility Authority	1.20
	Tequesta, Village of	1.22
	Wellington Public Utilities Dept.	1.13
	West Palm Beach Public Utilities, City of	1.03
Broward	BCWWS District 1	1.03
	BCWWS District 2A/NR Wellfield	1.03
	Cooper City Utility Dept., City of	1.20
	Coral Springs, City of	1.03
	CSID	1.18
	Dania Beach, City of	1.08
	Davie, Town of	1.16
	Deerfield Beach, City of	1.13
	Fort Lauderdale, City of	1.06
	Hallandale Beach, City of	1.12
	Hillsboro Beach, Town of	1.03
	Hollywood, City of	1.09
	Lauderhill, City of	1.03
	Margate, City of	1.03
	Miramar, City of	1.20
	North Lauderdale, City of	1.03
	NSID	1.03
	Parkland Utilities, Inc.	1.03
	Pembroke Pines, City of	1.03
	Plantation, City of	1.33
	Pompano Beach, City of	1.08
	Royal Utility Company	1.03
	Seminole Tribe of Florida (Hollywood)	1.03
	Sunrise, City of	1.09
	Tamarac, City of	1.03
	Tindall Hammock ISCD	1.03

County	PWS Utility	Raw-to-Finished Ratio
Miami-Dade	Americana Village	1.03
	Homestead, City of	1.03
	Florida City WSD	1.03
	MDWASD	1.04
	North Miami, City of	1.03
	North Miami Beach, City of	1.11
Monroe	FKAA	1.04
Hendry*	Seminole Tribe of Florida (Big Cypress)	1.03

BCWWS = Broward County Water and Wastewater Services; CSID = Coral Springs Improvement District; FKAA = Florida Keys Aqueduct Authority; ISCD = Irrigation and Soil Conservation District; LEC = Lower East Coast; MDWASD = Miami-Dade Water and Sewer Department; NR = North Regional; NSID = North Springs Improvement District; PBCWUD = Palm Beach County Water Utilities Department; PWS = Public Water Supply; WSD = Water and Sewer Department.

* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

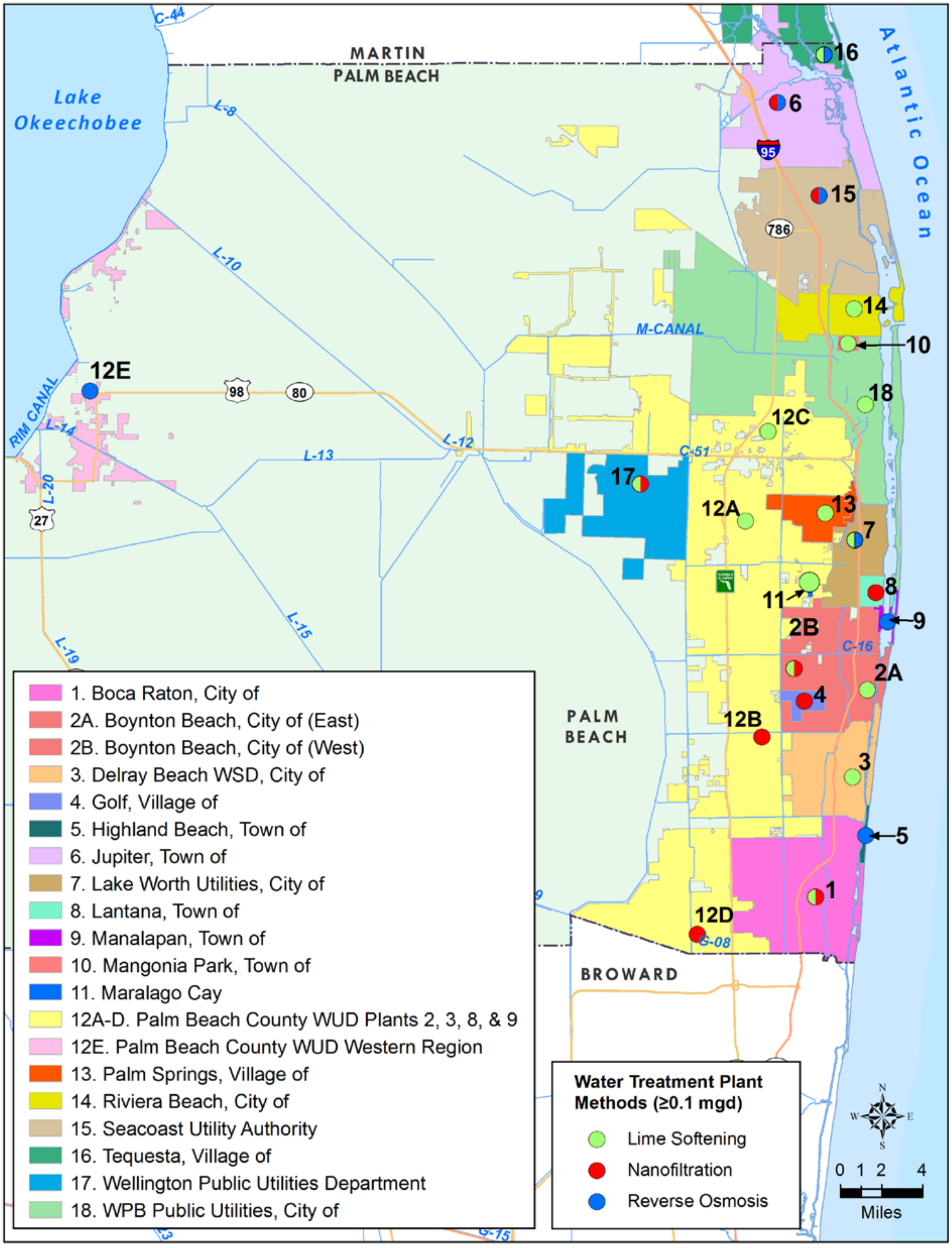

Figure B-2. Potable water treatment plants and Public Water Supply utility service areas in Palm Beach County.

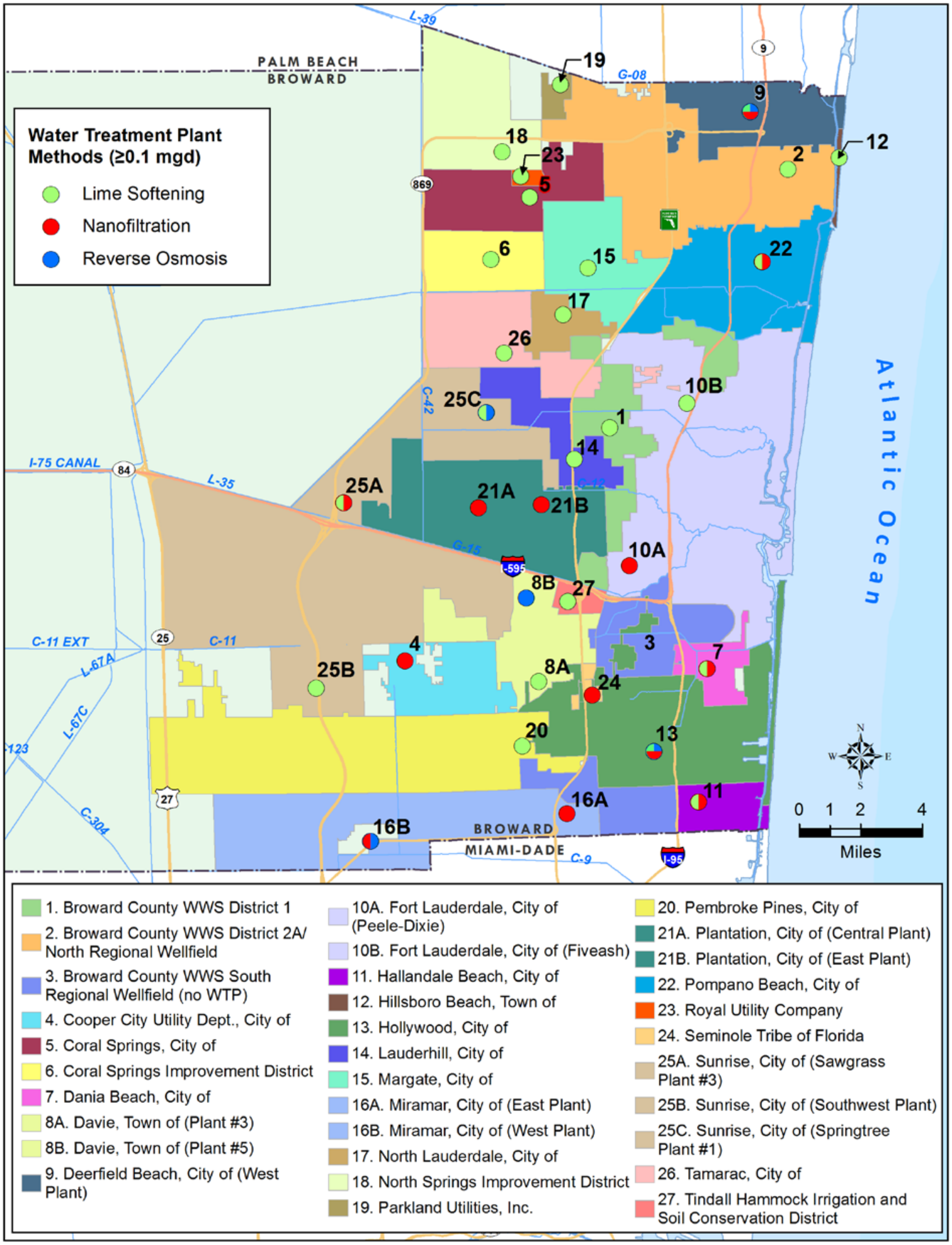

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Figure B-3. Potable water treatment plants and Public Water Supply utility service areas in Broward County.

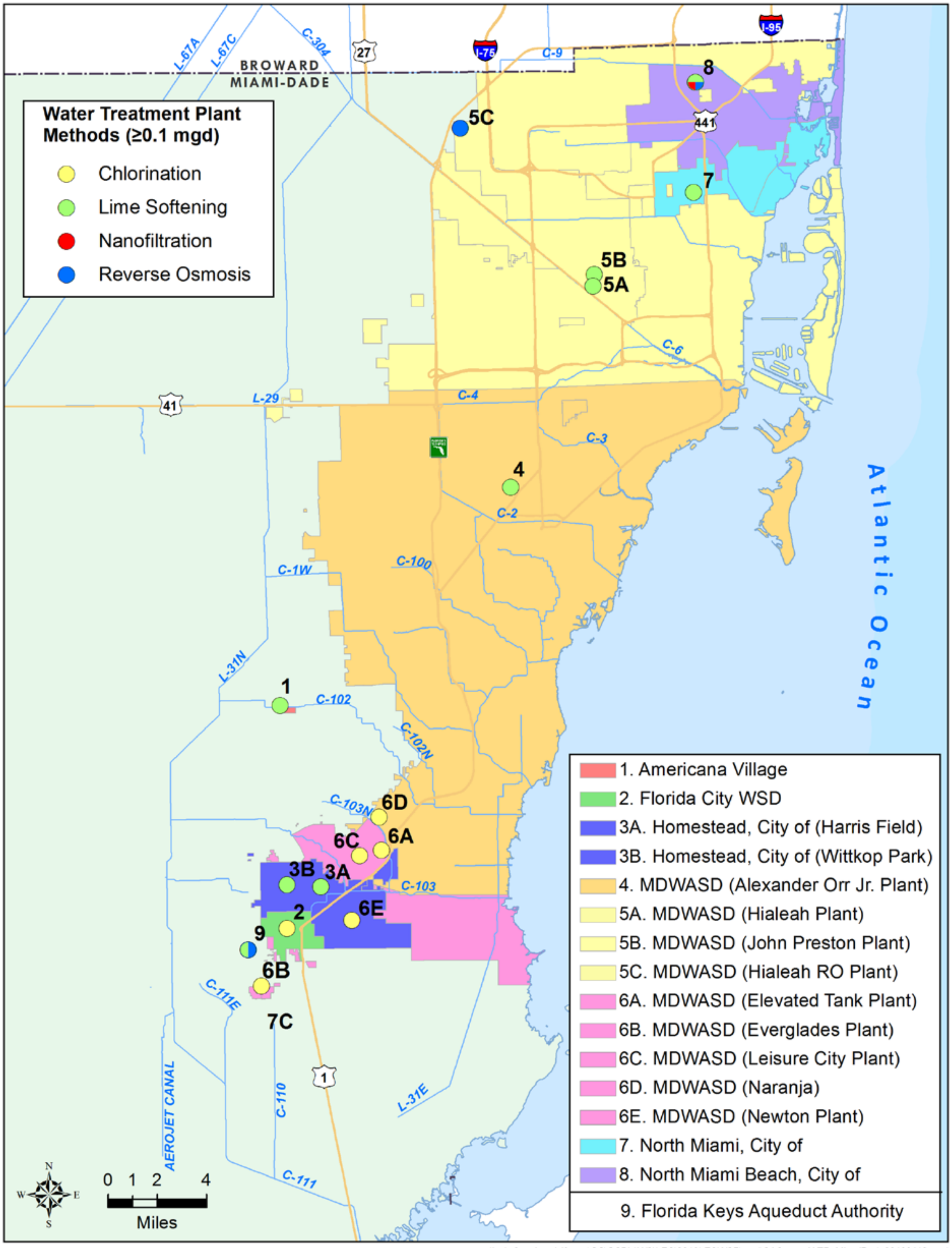

Figure B-4. Potable water treatment plants and Public Water Supply utility service areas in Miami-Dade County. (Note: Monroe County is served solely by the Florida Keys Aqueduct Authority, whose water treatment plant is located in Miami-Dade County.)

PWS Projection Results

Average Rainfall Conditions

Gross (raw) demands for PWS under average rainfall conditions for 2016 through 2040 are provided in **Table B-5**.

Table B-5. PWS gross (raw) water demands under average rainfall conditions in the LEC Planning Area.

County	PWS Utility	Demand - Average Rainfall Conditions (mgd)					
		2016	2020	2025	2030	2035	2040
Palm Beach	Boca Raton, City of	38.19	39.57	41.05	42.11	42.96	43.70
	Boynton Beach, City of	14.09	14.80	15.91	16.56	17.13	17.65
	Delray Beach WSD, City of	15.87	16.63	17.50	18.18	18.77	19.31
	Golf, Village of	0.52	0.53	0.54	0.54	0.55	0.55
	Highland Beach, Town of	1.70	1.74	1.77	1.79	1.80	1.80
	Jupiter, Town of	19.61	20.39	21.24	21.87	22.40	22.86
	Lake Worth Utilities, City of	5.73	6.00	6.30	6.53	6.74	6.92
	Lantana, Town of	2.26	2.32	2.37	2.40	2.42	2.44
	Manalapan, Town of	1.50	1.54	1.18	1.22	1.26	1.30
	Mangonia Park, Town of	0.36	0.39	0.43	0.46	0.49	0.51
	Maralago Cay	0.25	0.25	0.26	0.26	0.27	0.27
	PBCWUD	61.46	65.90	71.11	75.59	79.69	83.52
	PBCWUD Western Region	7.28	7.55	7.83	8.03	8.19	8.33
	Palm Springs, Village of	4.07	4.27	4.49	4.67	4.82	4.96
	Riviera Beach, City of	7.54	8.05	8.64	9.14	9.59	10.01
	Seacoast Utility Authority	20.79	21.62	22.53	23.21	23.78	24.28
	Tequesta, Village of	3.27	3.34	3.42	3.45	3.47	3.48
	Wellington Public Utilities Department	6.72	6.97	7.24	7.43	7.59	7.73
	West Palm Beach Public Utilities, City of	28.81	30.38	32.18	33.64	34.94	36.13
	Palm Beach County Total	**240.03**	**252.24**	**265.99**	**277.09**	**286.85**	**295.74**
Broward	BCWWS District 1	7.71	8.13	8.60	9.00	9.34	9.64
	BCWWS District 2A/NR Wellfield	13.50	13.89	14.30	14.58	14.77	15.60
	Cooper City Utility Department, City of	3.80	3.92	4.05	4.13	4.20	4.24
	Coral Springs, City of	6.40	6.73	7.11	7.42	7.69	7.92
	CSID	5.04	5.15	5.24	5.29	5.30	5.30
	Dania Beach, City of	2.12	2.35	2.63	2.89	3.13	3.35
	Davie, Town of	4.95	5.51	6.19	6.81	7.39	7.92
	Deerfield Beach, City of	10.49	11.18	11.98	12.66	13.25	13.78
	Fort Lauderdale, City of	40.20	43.35	47.08	50.39	53.36	56.60
	Hallandale Beach, City of	6.53	6.80	7.10	7.34	7.54	8.11
	Hillsboro Beach, Town of	0.67	0.69	0.72	0.73	0.74	0.75
	Hollywood, City of	24.15	25.31	26.63	27.70	28.59	29.35
	Lauderhill, City of	6.24	6.45	6.68	6.84	6.96	7.19
	Margate, City of	7.01	7.34	7.72	8.02	8.27	8.49
	Miramar, City of	15.33	15.99	16.72	17.31	17.77	18.17
	North Lauderdale, City of	2.92	3.02	3.13	3.21	3.27	3.32
	NSID	4.29	4.52	4.78	4.99	5.17	5.33
	Parkland Utilities, Inc.	0.24	0.27	0.30	0.33	0.36	0.38
	Pembroke Pines, City of	13.13	13.36	13.57	13.64	13.64	13.58
	Plantation, City of	13.60	14.14	14.75	15.22	15.60	15.90
	Pompano Beach, City of	14.51	15.72	17.16	18.45	19.61	20.67
	Royal Utility Corporation	0.37	0.38	0.39	0.40	0.40	0.41
	Seminole Tribe of Florida (Hollywood)	0.23	0.29	0.38	0.46	0.54	0.61
	Sunrise, City of	23.93	24.71	25.54	26.13	26.56	26.87
	Tamarac, City of	6.40	6.59	6.80	6.94	7.04	7.12
	Tindall Hammock ISCD	0.38	0.41	0.44	0.48	0.51	0.54
	Broward County Total	**234.17**	**246.19**	**259.99**	**271.37**	**281.00**	**291.15**

County	PWS Utility	Demand - Average Rainfall Conditions (mgd)					
		2016	2020	2025	2030	2035	2040
Miami-Dade	Americana Village	0.23	0.23	0.23	0.23	0.23	0.23
	Florida City WSD	2.09	2.49	2.98	3.46	3.92	4.36
	Homestead, City of	11.08	12.06	13.24	14.36	15.39	16.36
	MDWASD	328.32	351.65	372.33	391.11	407.84	427.12
	North Miami, City of	7.96	8.06	8.15	8.19	8.19	8.16
	North Miami Beach, City of	21.88	23.03	24.35	25.55	26.60	27.57
	Miami-Dade County Total	**371.56**	**397.52**	**421.28**	**442.90**	**462.17**	**483.80**
Monroe	FKAA	18.27	18.31	18.38	18.47	18.55	18.52
	Monroe County Total	**18.27**	**18.31**	**18.38**	**18.47**	**18.55**	**18.52**
Hendry*	Seminole Tribe of Florida (Big Cypress)	0.13	0.13	0.13	0.13	0.13	0.13
	Hendry County Total	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**	**0.13**
LEC Planning Area PWS Total		**864.15**	**914.38**	**965.76**	**1,009.96**	**1,048.69**	**1,089.34**

BCWWS = Broward County Water and Wastewater Services; CSID = Coral Springs Improvement District; FKAA = Florida Keys Aqueduct Authority; ISCD = Irrigation and Soil Conservation District; LEC = Lower East Coast; MDWASD = Miami-Dade Water and Sewer Department; mgd = million gallons per day; NR = North Regional; NSID = North Springs Improvement District; PBCWUD = Palm Beach County Water Utilities Department; PWS = Public Water Supply; WSD = Water and Sewer Department.

* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

1-in-10 Year Drought Conditions

Section 373.709, F.S., states that the level-of-certainty planning goal associated with identifying water demands shall be based on meeting demands during 1-in-10 year drought conditions. A 1-in-10 year drought is characterized by diminished rain and increased evapotranspiration relative to the historical record for a particular location. The increased PWS demands during 1-in-10 year drought conditions were calculated using the method described in the *Districtwide Water Supply Assessment* (SFWMD 1998), which considers the increased demands on the irrigation portion of PWS during droughts. Drought demand factors for each county (or portion of the county within the LEC Planning Area) are as follows:

> NOTE
>
> **Average Rainfall and 1-in-10 Year Drought**
>
> An **average rainfall** year is defined as a year having rainfall with a 50 percent probability of being exceeded in any other year.
>
> A **1-in-10 year drought** is defined as a year in which below normal rainfall occurs with a 90 percent probability of being exceeded in any other year. It has an expected return frequency of once in 10 years.

- Palm Beach County: 1.10
- Broward County: 1.10
- Miami-Dade County: 1.07
- Monroe County: 1.03
- Hendry County: 1.06

Average water demands were multiplied by the above ratios to calculate demands during 1-in-10 year drought conditions (**Tables B-6** and **B-7**).

Table B-6. PWS net (finished) water demands under 1-in-10 year drought conditions in the LEC Planning Area.

County	PWS Utility	Demand - 1-in-10 Year Drought Conditions (mgd)					
		2016	2020	2025	2030	2035	2040
Palm Beach	Boca Raton, City of	37.18	38.52	39.96	40.99	41.82	42.54
	Boynton Beach, City of	14.09	14.80	15.91	16.56	17.13	17.65
	Delray Beach WSD, City of	16.95	17.76	18.69	19.42	20.05	20.62
	Golf, Village of	0.48	0.49	0.50	0.51	0.51	0.51
	Highland Beach, Town of	1.41	1.44	1.47	1.48	1.49	1.49
	Jupiter, Town of	17.26	17.94	18.69	19.25	19.71	20.11
	Lake Worth Utilities, City of	5.58	5.84	6.13	6.36	6.56	6.74
	Lantana, Town of	2.11	2.16	2.21	2.24	2.26	2.27
	Manalapan, Town of	1.24	1.28	0.97	1.01	1.04	1.08
	Mangonia Park, Town of	0.39	0.42	0.46	0.49	0.52	0.55
	Maralago Cay	0.26	0.27	0.28	0.28	0.29	0.29
	PBCWUD	60.91	65.31	70.47	74.91	78.97	82.76
	PBCWUD Western Region	6.02	6.24	6.47	6.64	6.77	6.89
	Palm Springs, Village of	4.27	4.47	4.71	4.89	5.05	5.19
	Riviera Beach, City of	8.06	8.60	9.22	9.76	10.24	10.69
	Seacoast Utility Authority	19.06	19.82	20.66	21.28	21.80	22.26
	Tequesta, Village of	2.95	3.01	3.08	3.11	3.13	3.14
	Wellington Public Utilities Department	6.54	6.78	7.05	7.23	7.39	7.52
	West Palm Beach Public Utilities, City of	30.76	32.44	34.36	35.92	37.31	38.58
	Palm Beach County Total	**235.51**	**247.59**	**261.30**	**272.32**	**282.04**	**290.88**
Broward	BCWWS District 1	8.24	8.68	9.19	9.61	9.97	10.29
	BCWWS District 2A/NR Wellfield	13.78	14.19	14.63	14.93	15.13	15.27
	Cooper City Utility Department, City of	3.48	3.59	3.71	3.79	3.85	3.89
	Coral Springs, City of	6.84	7.19	7.60	7.93	8.21	8.46
	CSID	4.70	4.80	4.89	4.93	4.94	4.94
	Dania Beach, City of	2.16	2.40	2.68	2.94	3.18	3.41
	Davie, Town of	4.69	5.22	5.87	6.46	7.00	7.51
	Deerfield Beach, City of	10.80	11.47	12.24	12.91	13.49	14.00
	Fort Lauderdale, City of	41.72	44.98	48.86	52.29	55.37	58.19
	Hallandale Beach, City of	6.41	6.68	6.98	7.21	7.40	7.56
	Hillsboro Beach, Town of	0.72	0.74	0.76	0.78	0.80	0.81
	Hollywood, City of	24.37	25.54	26.87	27.95	28.85	29.62
	Lauderhill, City of	6.67	6.89	7.13	7.31	7.44	7.53
	Margate, City of	7.49	7.84	8.24	8.57	8.84	9.07
	Miramar, City of	14.05	14.66	15.33	15.86	16.29	16.65
	North Lauderdale, City of	3.12	3.23	3.35	3.43	3.50	3.55
	NSID	4.58	4.82	5.10	5.33	5.53	5.70
	Parkland Utilities, Inc.	0.26	0.29	0.32	0.35	0.38	0.41
	Pembroke Pines, City of	14.02	14.26	14.49	14.57	14.57	14.50
	Plantation, City of	11.25	11.70	12.20	12.59	12.90	13.15
	Pompano Beach, City of	14.78	16.01	17.48	18.79	19.97	21.05
	Royal Utility Corporation	0.40	0.41	0.42	0.43	0.43	0.43
	Seminole Tribe of Florida (Hollywood)	0.24	0.31	0.40	0.49	0.57	0.65
	Sunrise, City of	24.15	24.93	25.77	26.37	26.80	27.12
	Tamarac, City of	6.83	7.04	7.26	7.42	7.52	7.60
	Tindall Hammock ISCD	0.40	0.43	0.47	0.51	0.54	0.57
	Broward County Total	**236.16**	**248.31**	**262.24**	**273.75**	**283.47**	**291.94**

County	PWS Utility	Demand - 1-in-10 Year Drought Conditions (mgd)					
		2016	2020	2025	2030	2035	2040
Miami-Dade	Americana Village	0.24	0.24	0.24	0.24	0.24	0.24
	Florida City WSD	2.18	2.59	3.10	3.60	4.07	4.53
	Homestead, City of	11.51	12.53	13.76	14.91	15.99	17.00
	MDWASD	337.79	361.79	383.07	402.40	419.60	435.25
	North Miami, City of	8.26	8.37	8.46	8.50	8.50	8.48
	North Miami Beach, City of	21.09	22.20	23.47	24.62	25.65	26.57
	Miami-Dade County Total	**381.07**	**407.72**	**432.10**	**454.28**	**474.05**	**492.07**
Monroe	FKAA	18.09	18.13	18.20	18.30	18.37	18.34
	Monroe County Total	**18.09**	**18.13**	**18.20**	**18.30**	**18.37**	**18.34**
Hendry*	Seminole Tribe of Florida (Big Cypress)	0.13	0.13	0.13	0.13	0.14	0.14
	Hendry County Total	**0.13**	**0.13**	**0.13**	**0.13**	**0.14**	**0.14**
	LEC Planning Area PWS Total	**870.96**	**921.88**	**973.97**	**1,018.78**	**1,058.07**	**1,093.38**

BCWWS = Broward County Water and Wastewater Services; CSID = Coral Springs Improvement District; FKAA = Florida Keys Aqueduct Authority; ISCD = Irrigation and Soil Conservation District; LEC = Lower East Coast; MDWASD = Miami-Dade Water and Sewer Department; mgd = million gallons per day; NR = North Regional; NSID = North Springs Improvement District; PBCWUD = Palm Beach County Water Utilities Department; PWS = Public Water Supply; WSD = Water and Sewer Department.

* Values listed for Hendry County are only for the areas within the LEC Planning Area boundaries.

Table B-7. PWS gross (raw) water demands under 1-in-10 year drought conditions in the LEC Planning Area.

County	PWS Utility	Demand - 1-in-10 Year Drought Conditions (mgd)					
		2016	2020	2025	2030	2035	2040
Palm Beach	Boca Raton, City of	42.01	43.52	45.16	46.32	47.26	48.07
	Boynton Beach, City of	15.50	16.28	17.50	18.22	18.84	19.41
	Delray Beach WSD, City of	17.45	18.30	19.25	20.00	20.65	21.24
	Golf, Village of	0.57	0.58	0.59	0.60	0.60	0.60
	Highland Beach, Town of	1.87	1.91	1.95	1.97	1.98	1.98
	Jupiter, Town of	21.58	22.43	23.37	24.06	24.64	25.14
	Lake Worth Utilities, City of	6.30	6.60	6.93	7.19	7.41	7.61
	Lantana, Town of	2.49	2.55	2.61	2.64	2.66	2.68
	Manalapan, Town of	1.65	1.70	1.30	1.34	1.39	1.43
	Mangonia Park, Town of	0.40	0.43	0.47	0.50	0.54	0.57
	Maralago Cay	0.27	0.28	0.29	0.29	0.29	0.30
	PBCWUD	67.61	72.49	78.22	83.15	87.66	91.87
	PBCWUD Western Region	8.01	8.30	8.61	8.83	9.01	9.16
	Palm Springs, Village of	4.48	4.70	4.94	5.13	5.30	5.45
	Riviera Beach, City of	8.30	8.85	9.50	10.05	10.55	11.01
	Seacoast Utility Authority	22.87	23.78	24.79	25.53	26.16	26.71
	Tequesta, Village of	3.59	3.68	3.76	3.80	3.82	3.83
	Wellington Public Utilities Department	7.39	7.67	7.96	8.18	8.35	8.50
	West Palm Beach Public Utilities, City of	31.69	33.41	35.39	37.00	38.43	39.74
	Palm Beach County Total	**264.03**	**277.46**	**292.59**	**304.79**	**315.54**	**325.31**
Broward	BCWWS District 1	8.48	8.94	9.46	9.90	10.27	10.60
	BCWWS District 2A/NR Wellfield	14.85	15.28	15.73	16.03	16.24	17.16
	Cooper City Utility Department, City of	4.18	4.31	4.45	4.55	4.62	4.67
	Coral Springs, City of	7.05	7.41	7.82	8.17	8.46	8.71
	CSID	5.55	5.66	5.77	5.82	5.83	5.83
	Dania Beach, City of	2.34	2.59	2.90	3.18	3.44	3.68
	Davie, Town of	5.44	6.06	6.80	7.49	8.13	8.72
	Deerfield Beach, City of	11.54	12.30	13.17	13.92	14.58	15.16
	Fort Lauderdale, City of	44.23	47.68	51.79	55.43	58.69	62.26
	Hallandale Beach, City of	7.18	7.48	7.82	8.08	8.29	8.92
	Hillsboro Beach, Town of	0.74	0.76	0.79	0.81	0.82	0.83
	Hollywood, City of	26.57	27.84	29.29	30.47	31.44	32.29
	Lauderhill, City of	6.87	7.10	7.35	7.53	7.66	7.91
	Margate, City of	7.71	8.07	8.49	8.82	9.10	9.34
	Miramar, City of	16.86	17.59	18.40	19.04	19.55	19.98
	North Lauderdale, City of	3.21	3.33	3.45	3.54	3.60	3.65
	NSID	4.72	4.97	5.25	5.49	5.69	5.87
	Parkland Utilities, Inc.	0.27	0.29	0.33	0.36	0.39	0.42
	Pembroke Pines, City of	14.44	14.69	14.92	15.01	15.00	14.94
	Plantation, City of	14.96	15.56	16.23	16.75	17.16	17.50
	Pompano Beach, City of	15.97	17.29	18.88	20.29	21.57	22.74
	Royal Utility Corporation	0.41	0.42	0.43	0.44	0.44	0.45
	Seminole Tribe of Florida (Hollywood)	0.25	0.32	0.42	0.50	0.59	0.67
	Sunrise, City of	26.33	27.18	28.09	28.74	29.21	29.56
	Tamarac, City of	7.04	7.25	7.48	7.64	7.75	7.83
	Tindall Hammock ISCD	0.41	0.45	0.49	0.53	0.56	0.59
	Broward County Total	**257.58**	**270.81**	**285.98**	**298.51**	**309.10**	**320.26**

County	PWS Utility	Demand - 1-in-10 Year Drought Conditions (mgd)					
		2016	2020	2025	2030	2035	2040
Miami-Dade	Americana Village	0.25	0.25	0.25	0.25	0.25	0.25
	Florida City WSD	2.24	2.67	3.19	3.70	4.19	4.66
	Homestead, City of	11.85	12.91	14.17	15.36	16.47	17.51
	MDWASD	351.30	376.26	398.39	418.49	436.39	457.02
	North Miami, City of	8.51	8.62	8.72	8.76	8.76	8.73
	North Miami Beach, City of	23.41	24.64	26.06	27.33	28.47	29.50
	Miami-Dade County Total	**397.57**	**425.35**	**450.77**	**473.90**	**494.52**	**517.67**
Monroe	FKAA	18.82	18.86	18.93	19.03	19.10	19.08
	Monroe County Total	**18.82**	**18.86**	**18.93**	**19.03**	**19.10**	**19.08**
Hendry*	Seminole Tribe of Florida (Big Cypress)	0.14	0.13	0.13	0.14	0.14	0.14
	Hendry County Total	**0.14**	**0.13**	**0.13**	**0.14**	**0.14**	**0.14**
	LEC Planning Area PWS Total	**938.14**	**992.61**	**1,048.41**	**1,096.37**	**1,138.40**	**1,182.45**

BCWWS = Broward County Water and Wastewater Services; CSID = Coral Springs Improvement District; FKAA = Florida Keys Aqueduct Authority; ISCD = Irrigation and Soil Conservation District; LEC = Lower East Coast; MDWASD = Miami-Dade Water and Sewer Department; mgd = million gallons per day; NR = North Regional; NSID = North Springs Improvement District; PBCWUD = Palm Beach County Water Utilities Department; PWS = Public Water Supply; WSD = Water and Sewer Department.

* Values listed for Hendry County are only for the areas within the LEC Planning Area boundaries.

DOMESTIC AND SMALL PUBLIC SUPPLY

The DSS category includes potable water used by households that are served by small utilities with water withdrawals less than 0.10 mgd or that are self-supplied by private wells. The number of permanent residents within DSS areas were developed simultaneously with the PWS population estimates and projections, as described earlier. To determine the current and future DSS demands, the median PWS PCURs (**Table B-2**) were multiplied by the DSS permanent resident populations. Hendry County's DSS population PCUR published in the *2017 Lower West Coast Water Supply Plan Update* (SFWMD 2017a) was used for the county's DSS population within the LEC Planning Area. DSS county PCURs remain constant through 2040, similar to the approach taken for the PWS category. There are no DSS demands in Monroe County due to the lack of freshwater resources on the islands. For DSS demands, the raw-to-finished water ratio is assumed to be 1.00.

Tables B-8 and **B-9** contain the LEC Planning Area's DSS demand estimates and projections under average rainfall and 1-in-10 year drought conditions. The drought demand factors used for PWS also were used to calculate 1-in-10 year DSS demands. The average gross (raw) DSS demands in 2016 were 11.85 mgd for 103,908 permanent residents (**Table B-1**) and are expected to grow to 15.76 mgd in 2040.

Table B-8. DSS gross (raw) water demands under average rainfall conditions in the LEC Planning Area.

	Demand - Average Rainfall Conditions (mgd)					
	2016	2020	2025	2030	2035	2040
Palm Beach County DSS	7.62	7.76	7.88	7.91	7.92	7.90
Broward County DSS	1.01	0.95	0.85	0.75	0.65	0.54
Miami-Dade County DSS	2.84	3.55	4.43	5.29	6.11	6.91
Monroe County DSS	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County DSS*	0.38	0.39	0.40	0.40	0.41	0.41
LEC Planning Area DSS Total	**11.85**	**12.64**	**13.56**	**14.36**	**15.08**	**15.76**

DSS = Domestic and Small Public Supply; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Table B-9. DSS gross (raw) water demands under 1-in-10 year drought conditions in the LEC Planning Area.

	Demand - 1-in-10 Year Drought Conditions (mgd)					
	2016	2020	2025	2030	2035	2040
Palm Beach County DSS	8.38	8.53	8.66	8.71	8.71	8.69
Broward County DSS	1.11	1.04	0.94	0.83	0.71	0.59
Miami-Dade County DSS	3.04	3.80	4.74	5.66	6.54	7.39
Monroe County DSS	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County DSS*	0.40	0.41	0.42	0.43	0.43	0.44
LEC Planning Area DSS Total	**12.94**	**13.78**	**14.76**	**15.62**	**16.39**	**17.11**

DSS = Domestic and Small Public Supply; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

AGRICULTURAL IRRIGATION

Water demands reported under AGR include water used for agricultural production, such as farm irrigation, operation of greenhouses and nurseries, and raising livestock. Water used in the processing of agricultural commodities is accounted for under the ICI category.

Previous LEC water supply plan updates relied on various sources to develop agricultural acreage estimates and projections, including agricultural water use permits, parcel-level land use maps, and results from the United States Census of Agriculture. Irrigated acreages were translated to water volume (mgd) estimates using the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) model (Smajstrla 1990).

Florida State legislation passed in 2013 prescribed a new approach for water management districts to consider agricultural water demands. Section 570.93, F.S., directs the Florida Department of Agriculture and Consumer Services (FDACS) to develop annual statewide agricultural acreage and water demand projections based on the same 20-year planning horizon used in water supply planning. Under Section 373.709(2)(a), F.S., water management districts are required to consider FDACS projections, and any adjustments or deviations from the projections published by FDACS, "…must be fully described, and the original data must be presented along with the adjusted data."

AGR Projection Methodology

FSAID IV Acreage and Demands Data

FDACS publishes 20-year agricultural acreage and associated water demand projections in annual Florida Statewide Agricultural Irrigation Demand (FSAID) reports. The fourth annual report (referred to as FSAID IV) was published in 2017 (FDACS 2017). The FSAID IV acres (**Tables B-10** and **B-11**) are used in this 2018 LEC Plan Update, with one exception. FSAID IV sugarcane acreage was reduced by 18,571 acres beginning in 2025 to reflect the planned construction of the A-2 Reservoir and stormwater treatment area (also known as the Everglades Agricultural Area Reservoir). **Table B-10** represents the unadjusted LEC Planning Area irrigated acres as published by FDACS. The FSAID IV demands in **Table B-11** and **Figure B-5** also are unadjusted. Unless otherwise noted, all other results include the removal of 18,571 acres of sugarcane in Palm Beach County and the associated demand reduction. FSAID IV acreage estimates and projections are used in this 2018 LEC Plan Update; however, water demands were calculated separately using the AFSIRS model.

Table B-10. Agricultural acres (unadjusted for A-2 Reservoir construction) in the LEC Planning Area (From: FDACS 2017).

Crop	2016	2020	2025	2030	2035	2040
Sugarcane	460,260	460,532	461,099	462,266	462,640	462,932
Fresh Market Vegetables	50,804	48,538	46,306	43,602	41,944	39,798
Citrus	21,223	21,784	21,802	22,204	22,797	22,867
Hay/Pasture	20,047	20,402	20,373	20,373	20,373	20,293
Greenhouse/Nursery	16,369	15,504	14,582	13,495	12,454	11,630
Fruit (Non-Citrus)	6,048	5,628	5,568	5,395	5,208	4,873
Sod	5,852	5,847	5,847	5,596	5,430	5,377
Potatoes	867	846	748	748	690	690
Field Crops	0	190	190	190	190	190
Total	**581,470**	**579,271**	**576,515**	**573,869**	**571,726**	**568,650**

FDACS = Florida Department of Agriculture and Consumer Services; LEC = Lower East Coast.

Table B-11. Agricultural demands (in mgd) (unadjusted for A-2 Reservoir construction) in the LEC Planning Area (From: FDACS 2017).

Crop	2016	2020	2025	2030	2035	2040
Sugarcane	484.28	484.99	486.51	489.95	492.88	494.99
Fresh Market Vegetables	66.45	64.91	64.93	64.28	64.33	64.22
Citrus	20.05	20.64	20.86	21.61	22.62	23.10
Hay/Pasture	14.21	14.94	16.11	16.58	16.49	16.39
Greenhouse/Nursery	38.01	34.72	32.24	29.52	26.96	24.96
Fruit (Non-Citrus)	11.32	10.59	10.60	10.54	10.45	10.13
Sod	5.91	5.90	5.90	5.62	5.44	5.42
Potatoes	0.65	0.63	0.58	0.61	0.60	0.62
Field Crops	0.00	0.15	0.15	0.15	0.15	0.15
Total	**640.88**	**637.47**	**637.88**	**638.86**	**639.92**	**639.98**

FDACS = Florida Department of Agriculture and Consumer Services; LEC = Lower East Coast; mgd = million gallons per day.

Comparison of FSAID IV and AFSIRS Demands

During the SFWMD's evaluation of FSAID IV demands, comparisons with AFSIRS demands were examined (**Figure B-5**). While the 2016 demand estimates from AFSIRS and FSAID IV were very similar, 2040 demands differed by approximately 30 mgd despite sharing a similar irrigated acreage footprint. FSAID IV AGR demands (A-2 Reservoir acres included) decline by less than 1 mgd despite the overall projected acreage reduction of 12,820 acres. This is primarily due to the FSAID IV model's higher projected irrigation volumes per acre for some crops in response to forecasts of higher profitability. Conversely, AFSIRS results exhibited a reduction in demands over the planning horizon that were similar in magnitude to the projected decrease in irrigated acres.

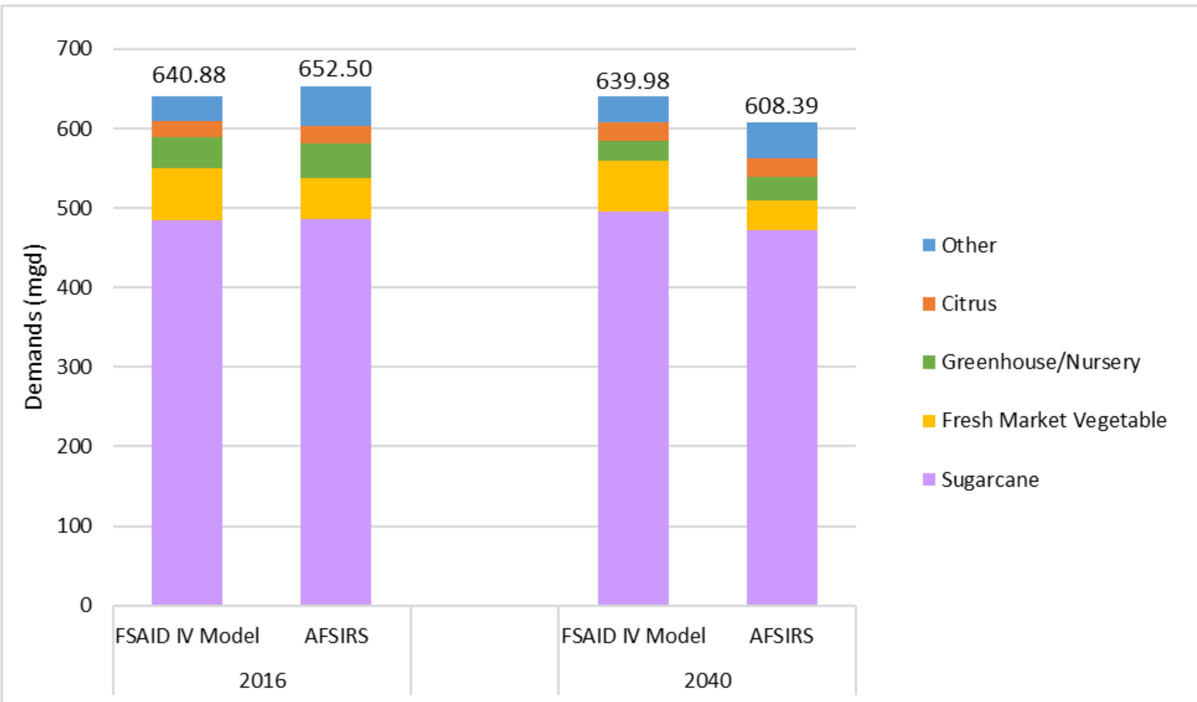

Figure B-5. Comparison of average water demands (unadjusted for A-2 Reservoir construction) from the fourth Florida Statewide Agricultural Irrigation Demand (FSAID IV) report and the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS).

The SFWMD uses AFSIRS to estimate demands simulated in regional groundwater models, and the demands using AFSIRS resemble those obtained through the SFWMD's permitting methods. After reviewing water demands from FSAID IV and AFSIRS, the SFWMD chose to use water demand estimates and projections from AFSIRS based on irrigated acres published in the FSAID IV report. The decision to deviate from water demands published in the FSAID IV report was made to maintain a consistent approach with previous planning and regional modeling efforts.

Data for soil type, rainfall, and reference evapotranspiration are among the key inputs used with AFSIRS to calculate current and future demands. Soil input data were obtained from the Natural Resources Conservation Service's SSURGO database (https://websoilsurvey.nrcs.usda.gov). Daily rainfall data were obtained from the SFWMD's Next Generation Radar (NEXRAD) rainfall data set. Reference evapotranspiration data were obtained from the United States Geological Survey's Statewide Evapotranspiration Information and Data database (http://fl.water.usgs.gov/et/).

Water demands associated with livestock and aquaculture production complete the demands for the AGR category. The demands for these activities are taken directly from the FSAID IV report, with adjustments made to the projected aquaculture demands in Miami-Dade County due to a planned and permitted aquaculture operation currently under construction, which is expected to be operational by 2020.


Livestock

AGR Projection Results

AGR acres and water demands depend on the choices of individual agricultural producers from year to year. Those choices are affected by several factors, including weather, markets, disease, proprietary information, and urban development pressure. AGR projections can be affected by population changes as well as future land use conversions.

The gross irrigation requirements for various crop types under the AGR category are provided in **Tables B-12** to **B-20**. **Tables B-21** and **B-22** summarize the gross water requirements for livestock and aquaculture. **Table B-23** summarizes all agricultural acreage in the LEC Planning Area, and **Table B-24** summarizes the gross irrigation requirements for all agricultural acreage in the region.


Sugarcane

Sugarcane

Table B-12 presents the SFWMD's sugarcane acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10 year drought conditions.

Table B-12. Gross irrigation demands (in mgd) for sugarcane acreage in the LEC Planning Area.

	2016	2020	2025	2030	2035	2040
Palm Beach County – Coastal						
Irrigated acres	761	693	693	693	54	0
Average rainfall	1.50	1.38	1.38	1.38	0.12	0.00
1-in-10 year drought	1.81	1.66	1.66	1.66	0.15	0.00
Palm Beach County – EAA						
Irrigated acres	407,573	407,573	389,007	389,007	389,007	389,007
Average rainfall	434.91	434.91	419.14	419.14	419.14	419.14
1-in-10 year drought	600.60	600.60	578.31	578.31	578.31	578.31
Broward County						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Miami-Dade County						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – EAA						
Irrigated acres	36,716	36,716	36,716	36,716	36,716	36,716
Average rainfall	33.49	33.49	33.49	33.49	33.49	33.49
1-in-10 year drought	48.73	48.73	48.73	48.73	48.73	48.73
Hendry County* – Western Basins						
Irrigated acres	15,209	15,549	16,116	17,282	18,296	18,639
Average rainfall	16.72	17.08	17.66	18.85	19.75	20.11
1-in-10 year drought	20.11	20.56	21.27	22.71	23.79	24.23
LEC Planning Area Total						
Irrigated acres	**460,260**	**460,531**	**442,532**	**443,698**	**444,073**	**444,362**
Average rainfall	**486.62**	**486.87**	**471.68**	**472.86**	**472.51**	**472.75**
1-in-10 year drought	**671.25**	**671.54**	**649.95**	**651.40**	**650.97**	**651.26**

EAA = Everglades Agricultural Area; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Fresh Market Vegetables

Table B-13 presents the SFWMD's fresh market vegetable acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10 year drought conditions, assuming 2 plantings per year lasting 4 months each.

Table B-13. Gross irrigation demands (in mgd) for fresh market vegetable acreage in the LEC Planning Area.

	2016	2020	2025	2030	2035	2040
Palm Beach County – Coastal						
Irrigated acres	11,270	8,621	6,175	3,837	2,080	0
Average rainfall	13.89	10.96	8.03	4.97	2.53	0.00
1-in-10 year drought	16.60	13.03	9.51	5.91	3.03	0.00
Palm Beach County – EAA						
Irrigated acres	230	230	230	230	230	230
Average rainfall	0.20	0.20	0.20	0.20	0.20	0.20
1-in-10 year drought	0.28	0.28	0.28	0.28	0.28	0.28
Broward County						
Irrigated acres	829	829	829	829	829	829
Average rainfall	1.14	1.14	1.14	1.14	1.14	1.14
1-in-10 year drought	1.39	1.39	1.39	1.39	1.39	1.39
Miami-Dade County						
Irrigated acres	17,936	17,562	16,986	16,507	15,884	15,454
Average rainfall	18.79	18.34	17.76	17.29	16.56	16.10
1-in-10 year drought	21.77	21.26	20.57	20.03	19.19	18.66
Hendry County* – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – Western Basins						
Irrigated acres	20,539	21,296	22,085	22,199	22,920	23,283
Average rainfall	16.56	17.16	17.79	17.88	18.47	18.78
1-in-10 year drought	20.13	20.87	21.64	21.75	22.47	22.84
LEC Planning Area Total						
Irrigated acres	**50,804**	**48,538**	**46,306**	**43,602**	**41,944**	**39,798**
Average rainfall	**50.58**	**47.80**	**44.91**	**41.48**	**38.90**	**36.22**
1-in-10 year drought	**60.16**	**56.82**	**53.39**	**49.35**	**46.36**	**43.17**

EAA = Everglades Agricultural Area; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Citrus

Table B-14 presents the SFWMD's citrus acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10 year drought conditions.

Table B-14. Gross irrigation demands (in mgd) for citrus acreage in the LEC Planning Area.

	2016	2020	2025	2030	2035	2040
Palm Beach County – Coastal						
Irrigated acres	276	268	74	45	34	0
Average rainfall	0.34	0.33	0.09	0.05	0.04	0.00
1-in-10 year drought	0.46	0.45	0.12	0.07	0.05	0.00
Palm Beach County – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Broward County						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Miami-Dade County						
Irrigated acres	729	721	709	694	694	682
Average rainfall	0.93	0.92	0.91	0.89	0.89	0.87
1-in-10 year drought	1.09	1.07	1.06	1.03	1.03	1.02
Hendry County* – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – Western Basins						
Irrigated acres	20,219	20,795	21,019	21,465	22,070	22,185
Average rainfall	21.01	21.61	21.84	22.32	22.92	23.03
1-in-10 year drought	25.50	26.22	26.50	27.08	27.82	27.96
LEC Planning Area Total						
Irrigated acres	**21,223**	**21,784**	**21,802**	**22,204**	**22,797**	**22,867**
Average rainfall	**22.29**	**22.86**	**22.84**	**23.27**	**23.85**	**23.90**
1-in-10 year drought	**27.05**	**27.74**	**27.68**	**28.19**	**28.91**	**28.97**

EAA = Everglades Agricultural Area; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Hay/Pasture

Table B-15 presents the SFWMD's hay/pasture acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10 year drought conditions. The FSAID acres for this category are labeled and modeled as hay. The associated demands calculated with AFSIRS are assumed to capture irrigation for hay and any irrigation used for improved pasture.

Table B-15. Gross irrigation demands (in mgd) for hay/pasture acreage in the LEC Planning Area.

	2016	2020	2025	2030	2035	2040
Palm Beach County – Coastal						
Irrigated acres	107	107	60	60	60	0
Average rainfall	0.15	0.15	0.08	0.08	0.08	0.00
1-in-10 year drought	0.20	0.20	0.11	0.11	0.11	0.00
Palm Beach County – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Broward County						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Miami-Dade County						
Irrigated acres	63	63	63	63	63	44
Average rainfall	0.10	0.10	0.10	0.10	0.10	0.07
1-in-10 year drought	0.12	0.12	0.12	0.12	0.12	0.08
Hendry County* – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – Western Basins						
Irrigated acres	19,876	20,232	20,249	20,249	20,249	20,249
Average rainfall	23.60	23.98	24.00	24.00	24.00	24.00
1-in-10 year drought	28.23	28.69	28.71	28.71	28.71	28.72
LEC Planning Area Total						
Irrigated acres	**20,047**	**20,402**	**20,373**	**20,373**	**20,373**	**20,293**
Average rainfall	**23.85**	**24.23**	**24.19**	**24.19**	**24.19**	**24.07**
1-in-10 year drought	**28.55**	**29.01**	**28.94**	**28.94**	**28.94**	**28.80**

EAA = Everglades Agricultural Area; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Greenhouse/Nursery

Table B-16 presents the SFWMD's greenhouse/nursery acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10 year drought conditions.

Table B-16. Gross irrigation demands (in mgd) for greenhouse/nursery acreage in the LEC Planning Area.

	2016	2020	2025	2030	2035	2040
Palm Beach County – Coastal						
Irrigated acres	3,758	3,152	2,494	1,750	946	348
Average rainfall	11.11	9.41	7.53	5.21	2.75	1.04
1-in-10 year drought	12.35	10.42	8.32	5.76	3.04	1.15
Palm Beach County – EAA						
Irrigated acres	1,063	1,063	1,063	1,063	1,063	1,063
Average rainfall	0.96	0.96	0.96	0.96	0.96	0.96
1-in-10 year drought	1.35	1.35	1.35	1.35	1.35	1.35
Broward County						
Irrigated acres	585	578	563	558	551	532
Average rainfall	2.01	1.99	1.94	1.93	1.90	1.83
1-in-10 year drought	2.20	2.19	2.13	2.11	2.09	2.01
Miami-Dade County						
Irrigated acres	10,963	10,712	10,461	10,124	9,895	9,687
Average rainfall	30.12	29.42	28.71	27.79	27.14	26.60
1-in-10 year drought	31.90	31.16	30.41	29.43	28.74	28.17
Hendry County* – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – Western Basins						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
LEC Planning Area Total						
Irrigated acres	**16,369**	**15,504**	**14,582**	**13,495**	**12,454**	**11,630**
Average rainfall	**44.20**	**41.78**	**39.14**	**35.89**	**32.74**	**30.44**
1-in-10 year drought	**47.80**	**45.11**	**42.21**	**38.65**	**35.21**	**32.68**

EAA = Everglades Agricultural Area; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Fruit (Non-Citrus)

Table B-17 presents the SFWMD's fruit (non-citrus) acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10 year drought conditions.

Table B-17. Gross irrigation demands (in mgd) for fruit (non-citrus) acreage in the LEC Planning Area.

	2016	2020	2025	2030	2035	2040
Palm Beach County – Coastal						
Irrigated acres	36	7	7	7	7	7
Average rainfall	0.07	0.01	0.01	0.01	0.01	0.01
1-in-10 year drought	0.08	0.01	0.01	0.01	0.01	0.01
Palm Beach County – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Broward County						
Irrigated acres	15	15	15	15	15	15
Average rainfall	0.04	0.04	0.04	0.04	0.04	0.04
1-in-10 year drought	0.04	0.04	0.04	0.04	0.04	0.04
Miami-Dade County						
Irrigated acres	5,998	5,607	5,546	5,373	5,187	4,851
Average rainfall	13.92	12.98	12.83	12.44	11.98	11.14
1-in-10 year drought	15.39	14.36	14.19	13.75	13.24	12.32
Hendry County* – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – Western Basins						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
LEC Planning Area Total						
Irrigated acres	**6,048**	**5,628**	**5,568**	**5,395**	**5,208**	**4,873**
Average rainfall	**14.02**	**13.03**	**12.88**	**12.49**	**12.02**	**11.19**
1-in-10 year drought	**15.51**	**14.41**	**14.24**	**13.80**	**13.29**	**12.37**

EAA = Everglades Agricultural Area; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Sod

Table B-18 presents the SFWMD's sod acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10 year drought conditions.

Table B-18. Gross irrigation demands (in mgd) for sod acreage in the LEC Planning Area.

	2016	2020	2025	2030	2035	2040
Palm Beach County – Coastal						
Irrigated acres	407	407	407	156	0	0
Average rainfall	0.95	0.95	0.95	0.36	0.00	0.00
1-in-10 year drought	1.17	1.17	1.17	0.45	0.00	0.00
Palm Beach County – EAA						
Irrigated acres	5,231	5,231	5,231	5,231	5,231	5,231
Average rainfall	8.60	8.60	8.60	8.60	8.60	8.60
1-in-10 year drought	11.50	11.50	11.50	11.50	11.50	11.50
Broward County						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Miami-Dade County						
Irrigated acres	215	209	209	209	200	146
Average rainfall	0.54	0.53	0.53	0.53	0.51	0.36
1-in-10 year drought	0.61	0.59	0.59	0.59	0.57	0.40
Hendry County* – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – Western Basins						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
LEC Planning Area Total						
Irrigated acres	**5,852**	**5,847**	**5,847**	**5,596**	**5,431**	**5,377**
Average rainfall	**10.09**	**10.08**	**10.08**	**9.49**	**9.11**	**8.96**
1-in-10 year drought	**13.28**	**13.27**	**13.27**	**12.55**	**12.08**	**11.91**

EAA = Everglades Agricultural Area; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Potatoes

Table B-19 presents the SFWMD's potatoes acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10 year drought conditions.

Table B-19. Gross irrigation demands (in mgd) for potato acreage in the LEC Planning Area.

	2016	2020	2025	2030	2035	2040
Palm Beach County – Coastal						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Palm Beach County – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Broward County						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Miami-Dade County						
Irrigated acres	867	846	748	748	690	690
Average rainfall	0.85	0.83	0.72	0.72	0.67	0.67
1-in-10 year drought	1.01	0.98	0.86	0.86	0.79	0.79
Hendry County* – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – Western Basins						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
LEC Planning Area Total						
Irrigated acres	**867**	**846**	**748**	**748**	**690**	**690**
Average rainfall	**0.85**	**0.83**	**0.72**	**0.72**	**0.67**	**0.67**
1-in-10 year drought	**1.01**	**0.98**	**0.86**	**0.86**	**0.79**	**0.79**

EAA = Everglades Agricultural Area; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Field Crops

Table B-20 presents the SFWMD's field crops acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10 year drought conditions. The field crops category includes soybeans, field corn, peanuts, dried beans, lentils, and other grains.

Table B-20. Gross irrigation demands (in mgd) for field crop acreage in the LEC Planning Area.

	2016	2020	2025	2030	2035	2040
Palm Beach County – Coastal						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Palm Beach County – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Broward County						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Miami-Dade County						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – EAA						
Irrigated acres	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10 year drought	0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – Western Basins						
Irrigated acres	0	190	190	190	190	190
Average rainfall	0.00	0.19	0.19	0.19	0.19	0.19
1-in-10 year drought	0.00	0.23	0.23	0.23	0.23	0.23
LEC Planning Area Total						
Irrigated acres	**0**	**0**	**0**	**190**	**190**	**190**
Average rainfall	**0.00**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**
1-in-10 year drought	**0.00**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**

EAA = Everglades Agricultural Area; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Livestock

Table B-21 presents the FSAID IV water demand projections for livestock. Livestock demands published in the FSAID IV report were developed with assumed water requirements per head of livestock. Livestock demands are assumed to be the same under average rainfall and 1-in-10 year drought conditions.

Table B-21. Gross water demands (in mgd) for livestock in the LEC Planning Area.

2016	2020	2025	2030	2035	2040
Palm Beach County – Coastal					
0.19	0.19	0.19	0.19	0.19	0.19
Palm Beach County – EAA					
0.00	0.00	0.00	0.00	0.00	0.00
Broward County					
0.05	0.05	0.05	0.05	0.05	0.05
Miami-Dade County					
0.08	0.08	0.08	0.08	0.08	0.08
Monroe County					
0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – EAA					
0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – Western Basins					
0.43	0.43	0.43	0.43	0.43	0.43
LEC Planning Area Total					
0.75	**0.75**	**0.75**	**0.75**	**0.75**	**0.75**

EAA = Everglades Agricultural Area; LEC = Lower East Coast; mgd = million gallons per day.
Note: Water demands for livestock were obtained from the fourth Florida Statewide Agricultural Irrigation Demand (FSAID IV) report, not calculated using the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) model.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Aquaculture

Table B-22 presents the FSAID IV water demand projections for aquaculture based on reported water use. Demands were adjusted in Miami-Dade County to reflect a new aquaculture project that is expected to require 15.99 mgd by 2025. Aquaculture demands are assumed to be the same under average rainfall and 1-in-10 year drought conditions.

Table B-22. Gross water demands (in mgd) for aquaculture in the LEC Planning Area.

2016	2020	2025	2030	2035	2040
Palm Beach County – Coastal					
0.10	0.10	0.10	0.10	0.10	0.10
Palm Beach County – EAA					
0.00	0.00	0.00	0.00	0.00	0.00
Broward County					
0.02	0.02	0.02	0.02	0.02	0.02
Miami-Dade County					
0.09	4.79	15.99	15.99	15.99	15.99
Monroe County					
0.01	0.01	0.01	0.01	0.01	0.01
Hendry County* – EAA					
0.00	0.00	0.00	0.00	0.00	0.00
Hendry County* – Western Basins					
0.02	0.02	0.02	0.02	0.02	0.02
LEC Planning Area Total					
0.24	**4.94**	**16.14**	**16.14**	**16.14**	**16.14**

EAA = Everglades Agricultural Area; LEC = Lower East Coast; mgd = million gallons per day.
Note: Water demands for aquaculture were obtained from the fourth Florida Statewide Agricultural Irrigation Demand (FSAID IV) report, not calculated using the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) model.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Summary of Agricultural Results

Irrigated agricultural acres are projected to decrease 5 percent over the planning horizon, from 581,470 to 550,080 acres (**Tables B-23** and **B-24**). The largest declines are expected in Palm Beach County, partly due to the conversion of 18,571 acres of sugarcane to the planned A-2 Reservoir. The Palm Beach County portion of the Everglades Agricultural Area will continue to account for the majority AGR acres and demands in the LEC Planning Area (**Table B-23**). Sugarcane also will continue to dominate the AGR demands, accounting for 76 percent of the 2040 total AGR demand (**Table B-24**). Relatively little change is anticipated in AGR water demands for nearly all crops within the LEC Planning Area. The largest reductions in demands are projected for the fresh market vegetables and greenhouse/nursery categories. Each of their demands are projected to decrease by approximately 14 mgd by 2040. Aquaculture is projected to have the largest increase in demands (15.99 mgd) due to a new aquaculture facility under construction in Miami-Dade County. Overall, LEC Planning Area total gross water demands under average rainfall conditions for AGR are projected to decrease approximately 4 percent, from 653.47 mgd in 2016 to 625.27 mgd in 2040.

Table B-23. Summary of gross water demands (in mgd) for all agricultural acreage, livestock, and aquaculture in the LEC Planning Area, by county.

	2016	2020	2025	2030	2035	2040
Palm Beach County – Coastal						
Irrigated acres	16,614	13,255	9,910	6,548	3,180	356
Average rainfall	28.29	23.48	18.35	12.36	5.82	1.34
1-in-10 year drought	32.95	27.23	21.20	14.26	6.69	1.45
Palm Beach County – EAA						
Irrigated acres	414,097	414,097	395,531	395,531	395,531	395,531
Average rainfall	444.67	444.67	428.90	428.90	428.90	428.90
1-in-10 year drought	613.73	613.73	591.44	591.44	591.44	591.44
Broward County						
Irrigated acres	1,430	1,422	1,408	1,403	1,396	1,376
Average rainfall	3.26	3.24	3.19	3.17	3.15	3.08
1-in-10 year drought	3.70	3.68	3.63	3.61	3.58	3.51
Miami-Dade County						
Irrigated acres	36,770	35,720	34,723	33,719	32,613	31,554
Average rainfall	65.43	67.90	77.63	75.84	73.92	71.89
1-in-10 year drought	72.05	74.31	83.87	81.89	79.75	77.51
Hendry County* – EAA						
Irrigated acres	36,716	36,716	36,716	36,716	36,716	36,716
Average rainfall	33.49	33.49	33.49	33.49	33.49	33.49
1-in-10 year drought	48.73	48.73	48.73	48.73	48.73	48.73
Hendry County* – Western Basins						
Irrigated acres	75,844	78,061	79,659	81,385	83,725	84,546
Average rainfall	78.33	80.47	81.93	83.69	85.77	86.56
1-in-10 year drought	94.42	97.01	98.80	100.93	103.48	104.43
LEC Planning Area Total						
Irrigated acres	**581,470**	**579,271**	**557,948**	**555,302**	**553,160**	**550,080**
Average rainfall	**653.47**	**653.25**	**643.51**	**637.45**	**631.06**	**625.27**
1-in-10 year drought	**865.58**	**864.70**	**847.66**	**840.85**	**833.67**	**827.06**

EAA = Everglades Agricultural Area; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Table B-24. Summary of gross water demands (in mgd) for all agricultural acreage, livestock, and aquaculture in the LEC Planning Area, by commodity.

	2016	2020	2025	2030	2035	2040
Sugarcane						
Irrigated acres	460,260	460,531	442,532	443,698	444,073	444,362
Average rainfall	486.62	486.87	471.68	472.86	472.51	472.75
1-in-10 year drought	671.25	671.54	649.95	651.40	650.97	651.26
Fresh Market Vegetables						
Irrigated acres	50,804	48,538	46,306	43,602	41,944	39,798
Average rainfall	50.58	47.80	44.91	41.48	38.90	36.22
1-in-10 year drought	60.16	56.82	53.39	49.35	46.36	43.17
Citrus						
Irrigated acres	21,223	21,784	21,802	22,204	22,797	22,867
Average rainfall	22.29	22.86	22.84	23.27	23.85	23.90
1-in-10 year drought	27.05	27.74	27.68	28.19	28.91	28.97
Hay/Pasture						
Irrigated acres	20,047	20,402	20,373	20,373	20,373	20,293
Average rainfall	23.85	24.23	24.19	24.19	24.19	24.07
1-in-10 year drought	28.55	29.01	28.94	28.94	28.94	28.80
Greenhouse/Nursery						
Irrigated acres	16,369	15,504	14,582	13,495	12,454	11,630
Average rainfall	44.20	41.78	39.14	35.89	32.74	30.44
1-in-10 year drought	47.80	45.11	42.21	38.65	35.21	32.68
Fruit (Non-Citrus)						
Irrigated acres	6,048	5,628	5,568	5,395	5,208	4,873
Average rainfall	14.02	13.03	12.88	12.49	12.02	11.19
1-in-10 year drought	15.51	14.41	14.24	13.80	13.29	12.37
Sod						
Irrigated acres	5,852	5,847	5,847	5,596	5,431	5,377
Average rainfall	10.09	10.08	10.08	9.49	9.11	8.96
1-in-10 year drought	13.28	13.27	13.27	12.55	12.08	11.91
Potatoes						
Irrigated acres	867	846	748	748	690	690
Average rainfall	0.85	0.83	0.72	0.72	0.67	0.67
1-in-10 year drought	1.01	0.98	0.86	0.86	0.79	0.79
Field Crops						
Irrigated acres	0	0	0	190	190	190
Average rainfall	0.00	0.19	0.19	0.19	0.19	0.19
1-in-10 year drought	0.00	0.23	0.23	0.23	0.23	0.23
Livestock						
Irrigated acres	--	--	--	--	--	--
Average rainfall	0.75	0.75	0.75	0.75	0.75	0.75
1-in-10 year drought	0.75	0.75	0.75	0.75	0.75	0.75
Aquaculture						
Irrigated acres	--	--	--	--	--	--
Average rainfall	0.24	4.94	16.14	16.14	16.14	16.14
1-in-10 year drought	0.24	4.94	16.14	16.14	16.14	16.14
LEC Planning Area Total						
Irrigated acres	**581,470**	**579,271**	**557,948**	**555,302**	**553,160**	**550,080**
Average rainfall	**653.47**	**653.25**	**643.51**	**637.45**	**631.06**	**625.27**
1-in-10 year drought	**865.58**	**864.70**	**847.66**	**840.85**	**833.67**	**827.06**

LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

RECREATIONAL/LANDSCAPE IRRIGATION

REC water demands include irrigation for golf courses and other landscaped areas such as parks, sports fields, and homeowners' association common areas. Demands are calculated only for REC areas with water use permits issued by the SFWMD. Some permitted areas are irrigated with reclaimed water, and reclaimed water demands are presented with groundwater and surface water demands due to its importance in REC areas. All REC demands are calculated using AFSIRS model results and the reclaimed water quantities reported to the FDEP.

There are three types of irrigated landscaped areas outside of those permitted by the SFWMD that are excluded from the REC demands. The first type includes landscaped areas irrigated with potable water provided PWS utilities. These demands are accounted for under PWS estimates and projections. The second type is irrigated landscaped areas served by individual residential wells permitted by rule [Rule 40E-2.061, F.A.C.] rather than with an individual water use permit. Demands associated with small residential wells are not quantified as part of this 2018 LEC Plan Update due to the lack of water use and acreage data. The third type of irrigated landscaped areas are those served with reclaimed water that do not require a water use permit. This usually occurs where reclaimed water is used directly from a pressurized pipeline or delivered into a lined lake, where there is no mixing with traditional water sources prior to use. Based on FDEP reported water use, approximately 15,000 acres are irrigated with reclaimed water and are not required to have a water use permit. While demands for these acres are not reported here, they are part of the discussion of current and future reclaimed supplies (**Chapter 7**).

REC Projection Methodology

REC demands are quantified in multiple ways. The distinction is made between REC demands for golf courses and other landscaped areas because they are projected to grow at different rates. Groundwater and surface water demands are presented separately from reclaimed water demands. The breakdown by source is provided due to the significance of reclaimed water use for golf and landscaped areas in the region.

Irrigated landscape and golf course acres were calculated using the permitted REC acreage from the SFWMD regulatory database (**Table B-25**). Most permits contain information that allows for the disaggregation of landscape and golf course acres. For those that do not, golf course data from the University of Florida GeoPlan Center provided estimates of the spatial extent of all active golf courses in the LEC Planning Area.

Table B-25. REC acres in the LEC Planning Area.

County	Use	2016	2020	2025	2030	2035	2040
Palm Beach	Landscape	29,856	31,100	32,655	34,210	35,765	37,320
	Golf	21,412	21,412	21,412	21,412	21,412	21,412
Palm Beach County Total		**51,268**	**52,512**	**54,067**	**55,622**	**57,177**	**58,732**
Broward	Landscape	20,428	21,143	22,036	22,930	23,824	24,718
	Golf	7,946	7,946	7,946	7,946	7,946	7,946
Broward County Total		**28,373**	**29,088**	**29,982**	**30,876**	**31,769**	**32,663**
Miami-Dade	Landscape	5674	5958	6312	6667	7021	7376
	Golf	4513	4513	4513	4513	4513	4513
Miami-Dade County Total		**10,187**	**10,470**	**10,825**	**11,180**	**11,534**	**11,889**
Monroe	Landscape	0	0	0	0	0	0
	Golf	287	287	287	287	287	287
Monroe County Total		**287**	**287**	**287**	**287**	**287**	**287**
Hendry*	Landscape	0	0	0	0	0	0
	Golf	0	0	0	0	0	0
Hendry County Total		**0**	**0**	**0**	**0**	**0**	**0**
LEC Planning Area	**Landscape**	**55,958**	**58,200**	**61,004**	**63,807**	**66,610**	**69,414**
	Golf	**34,157**	**34,157**	**34,157**	**34,157**	**34,157**	**34,157**
LEC Planning Area Total		**90,115**	**92,357**	**95,161**	**97,964**	**100,767**	**103,571**

LEC = Lower East Coast; REC = Recreational/Landscape Irrigation.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Landscape irrigation areas were assumed to increase at the same rate as the counties' permanent resident populations. This approach is commonly used in other planning areas within the SFWMD and other water management districts in Florida.

A different projection methodology with consideration of economic and golf land use trends was used for golf courses. From the 1950s to 2008, golf courses were built at an extraordinary pace in the LEC Planning Area, and Palm Beach County has the highest number of golf courses (112) of any county in the United States. However, since 2008, the region has experienced a halt in new golf course construction. Many golf courses are struggling financially, and there is increasing pressure to convert golf courses to residential developments. The recent slowdown in the industry is not unique to the region; the number of golfers in the United States fell 7.4 percent between 2011 and 2016 (National Golf Foundation 2017). Although there are unique aspects of the golf economy in LEC Planning Area that likely will help maintain the region's status as the "Golf Capital of the World," it is highly unlikely to see an expansion of golf course land use. Golf course acres and associated water demands are projected to remain at the current levels through 2040.

Demands met by reclaimed water were based on data from the FDEP's 2016 Reuse Inventory report (FDEP 2017), which were compared to permitted areas to determine the portion of reclaimed water used under the REC category. The anticipated share of future REC demands met with reclaimed water is based on the historical relationship of expanding reclaimed water supply and population growth, but it does not directly account for the potential impact of Ocean Outfall Law compliance plans. REC demands met with reclaimed water could be much larger if ocean outfall targets are met by 2025 (**Chapter 7**).

REC Projection Results

REC gross irrigation demand projections under average rainfall conditions, including current and projected demands for reclaimed water, are presented in **Table B-26**. **Table B-27** shows the additional quantity of water provided to meet projected demands during 1-in-10 year drought conditions.

Table B-26. REC gross irrigation demands under average rainfall conditions in the LEC Planning Area, by land use type.

County	Use	Demand - Average Rainfall Conditions (mgd)					
		2016	2020	2025	2030	2035	2040
Palm Beach	Landscape	45.06	46.94	49.28	51.63	53.98	56.32
	Golf	32.32	32.32	32.32	32.32	32.32	32.32
	Palm Beach County Total	**77.37**	**79.25**	**81.60**	**83.95**	**86.29**	**88.64**
Broward	Landscape	30.91	31.99	33.35	34.70	36.05	37.40
	Golf	12.02	12.02	12.02	12.02	12.02	12.02
	Broward County Total	**42.93**	**44.02**	**45.37**	**46.72**	**48.07**	**49.43**
Miami-Dade	Landscape	8.54	8.97	9.51	10.04	10.57	11.11
	Golf	6.80	6.80	6.80	6.80	6.80	6.80
	Miami-Dade County Total	**15.34**	**15.77**	**16.30**	**16.83**	**17.37**	**17.90**
Monroe	Landscape	0.00	0.00	0.00	0.00	0.00	0.00
	Golf	0.49	0.49	0.49	0.49	0.49	0.49
	Monroe County Total	**0.49**	**0.49**	**0.49**	**0.49**	**0.49**	**0.49**
Hendry*	Landscape	0.00	0.00	0.00	0.00	0.00	0.00
	Golf	0.00	0.00	0.00	0.00	0.00	0.00
	Hendry County Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
LEC Planning Area	**Landscape**	**84.51**	**87.90**	**92.13**	**96.37**	**100.60**	**104.83**
	Golf	**51.63**	**51.63**	**51.63**	**51.63**	**51.63**	**51.63**
	LEC Planning Area Total	**136.14**	**139.53**	**143.76**	**147.99**	**152.23**	**156.46**

LEC = Lower East Coast; mgd = million gallons per day; REC = Recreational/Landscape Irrigation.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Table B-27. REC gross irrigation demands under 1-in-10 year drought conditions in the LEC Planning Area, by land use type.

County	Use	Demand - 1-in-10 Year Drought Conditons (mgd)					
		2016	2020	2025	2030	2035	2040
Palm Beach	Landscape	53.21	55.42	58.20	60.97	63.74	66.51
	Golf	38.16	38.16	38.16	38.16	38.16	38.16
	Palm Beach County Total	**91.37**	**93.58**	**96.35**	**99.13**	**101.90**	**104.67**
Broward	Landscape	35.83	37.09	38.65	40.22	41.79	43.36
	Golf	13.94	13.94	13.94	13.94	13.94	13.94
	Broward County Total	**49.77**	**51.02**	**52.59**	**54.16**	**55.73**	**57.29**
Miami-Dade	Landscape	9.68	10.16	10.76	11.37	11.97	12.58
	Golf	7.70	7.70	7.70	7.70	7.70	7.70
	Miami-Dade County Total	**17.37**	**17.86**	**18.46**	**19.07**	**19.67**	**20.28**
Monroe	Landscape	0.00	0.00	0.00	0.00	0.00	0.00
	Golf	0.53	0.53	0.53	0.53	0.53	0.53
	Monroe County Total	**0.53**	**0.53**	**0.53**	**0.53**	**0.53**	**0.53**
Hendry*	Landscape	0.00	0.00	0.00	0.00	0.00	0.00
	Golf	0.00	0.00	0.00	0.00	0.00	0.00
	Hendry County Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
LEC Planning Area	**Landscape**	**98.71**	**102.67**	**107.61**	**112.56**	**117.50**	**122.44**
	Golf	**60.33**	**60.33**	**60.33**	**60.33**	**60.33**	**60.33**
	LEC Planning Area Total	**159.04**	**163.00**	**167.94**	**172.88**	**177.83**	**182.77**

LEC = Lower East Coast; mgd = million gallons per day; REC = Recreational/Landscape Irrigation.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Tables B-28 and **B-29** contain REC projections, by source, under average rainfall and 1-in-10 year drought conditions. Demands on traditional groundwater and surface water sources are separated from demands served by reclaimed water. In 2016, approximately 18 percent (24.37 mgd) of REC demands were met with reclaimed water.

Table B-28. REC gross irrigation demand under average rainfall conditions in the LEC Planning Area, by source.

County	Source	Demand - Average Rainfall Conditions (mgd)					
		2016	2020	2025	2030	2035	2040
Palm Beach	Groundwater/Surface Water	56.58	55.67	55.31	55.78	56.70	57.93
	Reclaimed Water	20.79	23.58	26.29	28.17	29.60	30.71
	Palm Beach County Total	**77.37**	**79.25**	**81.60**	**83.95**	**86.29**	**88.64**
Broward	Groundwater/Surface Water	39.59	39.66	39.42	39.24	39.16	39.17
	Reclaimed Water	3.35	4.35	5.95	7.48	8.91	10.26
	Broward County Total	**42.93**	**44.02**	**45.37**	**46.72**	**48.07**	**49.43**
Miami-Dade	Groundwater/Surface Water	15.34	15.77	16.30	16.83	17.37	17.90
	Reclaimed Water	0.00	0.00	0.00	0.00	0.00	0.00
	Miami-Dade County Total	**15.34**	**15.77**	**16.30**	**16.83**	**17.37**	**17.90**
Monroe	Groundwater/Surface Water	0.26	0.26	0.26	0.26	0.26	0.26
	Reclaimed Water	0.23	0.23	0.23	0.23	0.23	0.23
	Monroe County Total	**0.49**	**0.49**	**0.49**	**0.49**	**0.49**	**0.49**
Hendry*	Groundwater/Surface Water	0.00	0.00	0.00	0.00	0.00	0.00
	Reclaimed Water	0.00	0.00	0.00	0.00	0.00	0.00
	Hendry County Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
LEC Planning Area	**Groundwater/Surface Water**	**111.77**	**111.36**	**111.29**	**112.11**	**113.49**	**115.26**
	Reclaimed Water	**24.37**	**28.16**	**32.47**	**35.88**	**38.74**	**41.20**
	LEC Planning Area Total	**136.14**	**139.53**	**143.76**	**147.99**	**152.23**	**156.46**

LEC = Lower East Coast; mgd = million gallons per day; REC = Recreational/Landscape Irrigation.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Table B-29. REC gross irrigation demand under 1-in-10 year drought conditions in the LEC Planning Area, by source.

County	Source	Demand - 1-in-10 Year Drought Conditons (mgd)					
		2016	2020	2025	2030	2035	2040
Palm Beach	Groundwater/Surface Water	66.82	65.74	65.31	65.86	66.95	68.40
	Reclaimed Water	24.55	27.85	31.04	33.26	34.95	36.27
	Palm Beach County Total	**91.37**	**93.58**	**96.35**	**99.13**	**101.90**	**104.67**
Broward	Groundwater/Surface Water	45.89	45.97	45.69	45.49	45.39	45.40
	Reclaimed Water	3.88	5.05	6.90	8.67	10.33	11.89
	Broward County Total	**49.77**	**51.02**	**52.59**	**54.16**	**55.73**	**57.29**
Miami-Dade	Groundwater/Surface Water	17.37	17.86	18.46	19.07	19.67	20.28
	Reclaimed Water	0.00	0.00	0.00	0.00	0.00	0.00
	Miami-Dade County Total	**17.37**	**17.86**	**18.46**	**19.07**	**19.67**	**20.28**
Monroe	Groundwater/Surface Water	0.28	0.28	0.28	0.28	0.28	0.28
	Reclaimed Water	0.25	0.25	0.25	0.25	0.25	0.25
	Monroe County Total	**0.53**	**0.53**	**0.53**	**0.53**	**0.53**	**0.53**
Hendry*	Groundwater/Surface Water	0.00	0.00	0.00	0.00	0.00	0.00
	Reclaimed Water	0.00	0.00	0.00	0.00	0.00	0.00
	Hendry County Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
LEC Planning Area	**Groundwater/Surface Water**	**130.36**	**129.85**	**129.75**	**130.70**	**132.30**	**134.36**
	Reclaimed Water	**28.68**	**33.14**	**38.19**	**42.18**	**45.53**	**48.41**
	LEC Planning Area Total	**159.04**	**163.00**	**167.94**	**172.88**	**177.83**	**182.77**

LEC = Lower East Coast; mgd = million gallons per day; REC = Recreational/Landscape Irrigation.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

INDUSTRIAL/COMMERCIAL/INSTITUTIONAL

The ICI water use category includes demands associated with industrial and commercial operations for processing, manufacturing, and technical needs such as concrete, citrus and vegetable processing, and mining operations. ICI demands only include self-supplied users and do not include industrial or commercial users that receive water from PWS utilities; those users are included in the PWS category. Recirculated water used in closed-loop geothermal heating and cooling systems is not included in demand calculations. Although a large portion of ICI water used by the mining industry for activities such as rock washing is returned to the source, all mining water use is included in demand estimates and projections. All ICI demand estimates and projections are presumed to be the same for average rainfall and 1-in-10 year drought conditions.

ICI Projection Methodology

ICI estimates and projections are based on water use data from the SFWMD's regulatory database. If an active ICI permit holder did not report water use, demand estimates were calculated as described in the *2016 Estimated Water Use Report* (SFWMD 2017b).

In the LEC Planning Area, large mining operations account for more than 90 percent of 2016 ICI demands. Growth within the ICI category is expected to be driven by sand, gravel, and stone mining supporting new construction from regional population growth. Therefore, ICI projections are anticipated to grow at the same rate as county permanent resident populations. Previous analyses of the relationship between mining water use and permanent resident population support this approach.

ICI Projection Results

Table B-30 summarizes the current and projected ICI demands in the LEC Planning Area in 5-year increments through 2040. Miami-Dade County maintains a dominant share of the region's ICI demands over the planning horizon.

Table B-30. ICI demand projections in the LEC Planning Area.

County	Demand (mgd)					
	2016	2020	2025	2030	2035	2040
Palm Beach	6.59	6.87	7.21	7.56	7.90	8.24
Broward	2.36	2.44	2.54	2.65	2.75	2.85
Miami-Dade	42.97	45.12	47.81	50.49	53.18	55.86
Monroe	0.00	0.00	0.00	0.00	0.00	0.00
Hendry*	0.01	0.01	0.01	0.01	0.01	0.01
LEC Planning Area Total	**51.93**	**54.44**	**57.57**	**60.71**	**63.84**	**66.96**

ICI = Industrial/Commercial/Institutional; LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

POWER GENERATION

Demands under the PWR category include use of groundwater, fresh surface water, or reclaimed water by thermoelectric power generation facilities. PWR demands do not include the use of brackish surface water and cooling water returned to its withdrawal source, or seawater. Potable water supplied by PWS utilities to power generation facilities is accounted for under PWS demands. Demands under average rainfall and 1-in-10 year drought conditions are assumed to be the same for the PWR category.

PWR Projection Methodology

There are 11 thermoelectric power generation facilities with a capacity greater than 60 megawatts currently operating in the LEC Planning Area (**Chapter 2**, Figure 2-4). However, only six facilities in Palm Beach and Miami-Dade counties have demands on groundwater, fresh surface water, or reclaimed water covered by the PWR category:

- Florida Power & Light (FPL) – West County Energy Center (Palm Beach County)
- Palm Beach County Solid Waste Authority – Renewable Energy Park
- Okeelanta Cogeneration Facility (Palm Beach County)
- FPL – Turkey Point Plant (Miami-Dade County)
- Miami-Dade County Resource Recovery Center
- City of Homestead – G.W. Ivey Power Plant (Miami-Dade County)

Baseline demand estimates were obtained from reported water use required as part of the utility's water use permit or the site certification under the Florida Power Plant Siting Act [Sections 403.501 to 403.518, F.S.]. When data were available, an average of water use over the last 5 years was used for demand estimates. Projected use was established in consultation with FPL.

Additional projected PWR demands are associated with potential development of a large-scale power generation facility in an area of Hendry County currently under agricultural production. The facility could include gas-fired and/or photovoltaic generation as detailed in FPL's (2018) Ten-Year Power Site Plan. Based on information from FPL, 13.00 mgd of process and cooling water are anticipated to be required by 2030 if the gas-fired generation facility on the northern portion of the site is developed; this would represent the upper limit of the demands for the proposed facility.

PWR Projection Results

Table B-31 shows anticipated PWR water demands through the 2040 planning horizon. PWR water demands are projected to increase from approximately 39.75 mgd in 2016 to 52.75 mgd in 2040.

Table B-31. PWR water demands in the LEC Planning Area.

County	Source	Demand - Average Rainfall Conditions (mgd)					
		2016	2020	2025	2030	2035	2040
Palm Beach	Groundwater/Surface Water	2.71	2.71	2.71	2.71	2.71	2.71
	Reclaimed Water	14.16	14.16	14.16	14.16	14.16	14.16
	Palm Beach County Total	**16.87**	**16.87**	**16.87**	**16.87**	**16.87**	**16.87**
Miami-Dade	Groundwater/Surface Water	22.88	22.88	22.88	22.88	22.88	22.88
	Reclaimed Water[1]	0.00	0.00	0.00	0.00	0.00	0.00
	Miami-Dade County Total	**22.88**	**22.88**	**22.88**	**22.88**	**22.88**	**22.88**
Hendry[2]	Groundwater/Surface Water	0.00	0.00	0.00	13.00	13.00	13.00
	Reclaimed Water	0.00	0.00	0.00	0.00	0.00	0.00
	Hendry County Total	**0.00**	**0.00**	**0.00**	**13.00**	**13.00**	**13.00**
LEC Planning Area	**Groundwater/Surface Water**	**25.59**	**25.59**	**25.59**	**38.59**	**38.59**	**38.59**
	Reclaimed Water	**14.16**	**14.16**	**14.16**	**14.16**	**14.16**	**14.16**
	LEC Planning Area Total	**39.75**	**39.75**	**39.75**	**52.75**	**52.75**	**52.75**

LEC = Lower East Coast; mgd = million gallons per day; PWR = Power Generation.

1 Florida Power & Light and Miami-Dade Water and Sewer Department are evaluating future use of reclaimed water at the Turkey Point Plant.

2 Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Palm Beach County's 2016 demands include approximately 14 mgd of reclaimed water used as process and cooling water at FPL's West County Energy Center. The Solid Waste Authority's Renewable Energy Park and the Okeelanta Cogeneration Facility contribute the approximately 3 mgd (groundwater) of remaining demand in Palm Beach County.

Demand estimates for Miami-Dade County include approximately 7 mgd of brackish Upper Floridan aquifer water used as process and cooling water at FPL's Turkey Point Plant. An additional 14 mgd of groundwater used to freshen the cooling canal system are included in the 2016 demands. Water use at the G.W. Ivey Power Plant and the Miami-Dade County Resource Recovery Center account for the remainder of Miami-Dade County's 2016 PWR demands.

As noted earlier, the LEC Planning Area's supply of reclaimed water could grow substantially by 2025 with Ocean Outfall Law compliance targets, which could impact future PWR demands. For example, in 2018, FPL and Miami-Dade County Water and Sewer Department agreed to investigate the potential of building a reclaimed water treatment facility to utilize up to 60 mgd of wastewater and provide up to 45 mgd of reclaimed water at the Turkey Point Plant. Beneficial uses could include makeup water for cooling towers and freshening water to help manage salinity in the cooling canals system. A 2010 agreement with FPL to use additional reclaimed water for cooling two new nuclear units at the Turkey Point Plant is still under consideration at the time of this plan update.

SUMMARY OF DEMAND PROJECTIONS

Total demands for the LEC Planning Area are anticipated to increase approximately 249 mgd (14 percent), largely due to increased demands from the PWS category. More than 90 percent of the demand growth is attributable to PWS. Demands under AGR are expected to decline slightly with the conversion of land to the A-2 Reservoir and stormwater treatment area and to urban development in Palm Beach and Miami-Dade counties. DSS, REC, ICI, and PWR demands are projected to grow with the increasing permanent resident population.

Gross water demand estimates (2016) and projections (2040) under average rainfall conditions for each water use category are shown in **Figure B-6**. Gross water demands in 5-year increments, by county and water use category, are provided in **Table B-32** for average rainfall conditions and **Table B-33** for 1-in-10 year drought conditions.

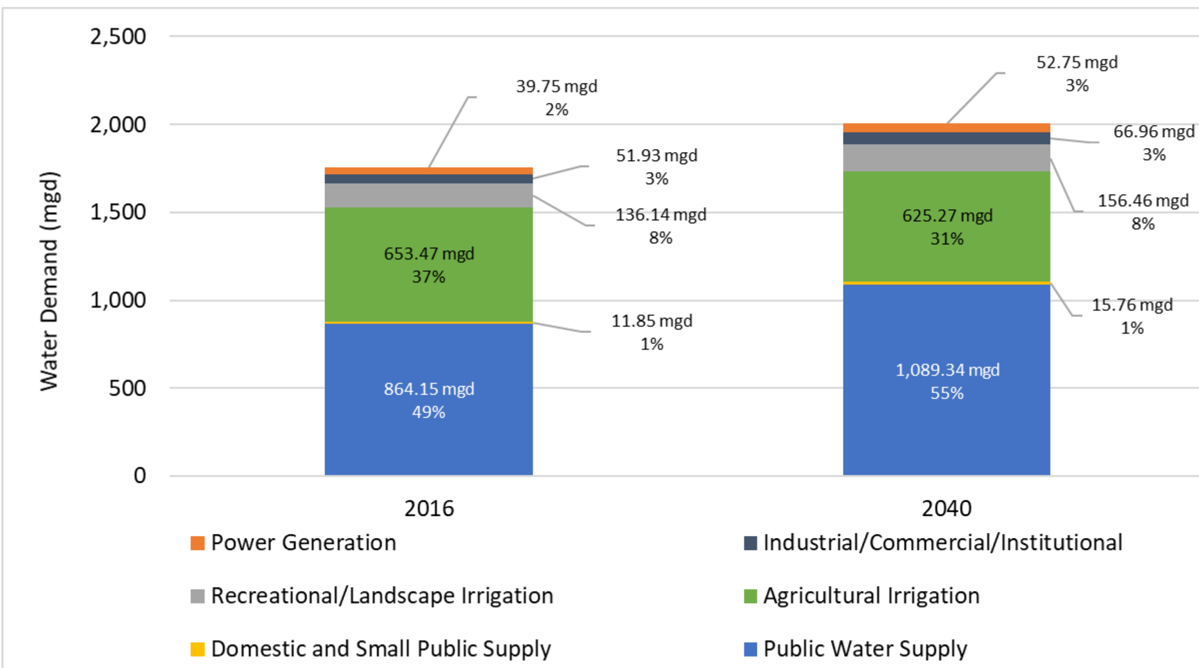

Figure B-6. Estimated (2016) and projected (2040) gross demands for all water use categories in the LEC Planning Area.

Table B-32. Summary of gross water demands under average rainfall conditions in the LEC Planning Area, by water use category.

County	Water Use Category	Demand - Average Rainfall Conditions (mgd)						
		2015	2016	2020	2025	2030	2035	2040
Palm Beach	Public Water Supply	237.73	240.03	252.24	265.99	277.09	286.85	295.74
	Domestic and Small Public Supply	7.55	7.62	7.76	7.88	7.91	7.92	7.90
	Agricultural Irrigation	472.96	472.96	468.15	447.26	441.26	434.72	430.25
	Recreational/Landscape Irrigation	76.94	77.37	79.25	81.60	83.95	86.30	88.64
	Industrial/Commercial/Institutional	6.53	6.59	6.87	7.21	7.56	7.90	8.24
	Power Generation	16.87	16.87	16.87	16.87	16.87	16.87	16.87
	Palm Beach County Total	**818.58**	**821.44**	**831.13**	**826.81**	**834.64**	**840.56**	**847.63**
Broward	Public Water Supply	230.74	234.17	246.19	259.99	271.37	281.00	291.15
	Domestic and Small Public Supply	1.00	1.01	0.95	0.85	0.75	0.65	0.54
	Agricultural Irrigation	3.26	3.26	3.24	3.19	3.17	3.15	3.08
	Recreational/Landscape Irrigation	42.48	42.94	44.01	45.37	46.72	48.07	49.43
	Industrial/Commercial/Institutional	2.32	2.36	2.44	2.54	2.65	2.75	2.85
	Power Generation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Broward County Total	**279.80**	**283.74**	**296.83**	**311.94**	**324.67**	**335.61**	**347.04**
Miami-Dade	Public Water Supply	362.05	371.56	397.52	421.28	442.90	462.17	483.80
	Domestic and Small Public Supply	2.79	2.84	3.55	4.43	5.29	6.11	6.91
	Agricultural Irrigation	65.43	65.43	67.90	77.63	75.84	73.92	71.89
	Recreational/Landscape Irrigation	15.19	15.34	15.77	16.30	16.83	17.37	17.90
	Industrial/Commercial/Institutional	42.23	42.97	45.12	47.81	50.49	53.18	55.86
	Power Generation	22.88	22.88	22.88	22.88	22.88	22.88	22.88
	Miami-Dade County Total	**510.57**	**521.02**	**552.74**	**590.34**	**614.22**	**635.63**	**659.24**
Monroe	Public Water Supply	17.83	18.27	18.31	18.38	18.47	18.55	18.52
	Domestic and Small Public Supply	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Agricultural Irrigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Recreational/Landscape Irrigation	0.49	0.49	0.49	0.49	0.49	0.49	0.49
	Industrial/Commercial/Institutional	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Power Generation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Monroe County Total	**18.32**	**18.76**	**18.80**	**18.87**	**18.96**	**19.04**	**19.01**
Hendry*	Public Water Supply	0.12	0.13	0.13	0.13	0.13	0.13	0.13
	Domestic and Small Public Supply	0.38	0.38	0.39	0.40	0.40	0.41	0.41
	Agricultural Irrigation	111.83	111.83	113.96	115.43	117.18	119.27	120.06
	Recreational/Landscape Irrigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Industrial/Commercial/Institutional	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Power Generation	0.00	0.00	0.00	0.00	13.00	13.00	13.00
	Hendry County Total	**112.34**	**112.35**	**114.49**	**115.97**	**130.72**	**132.82**	**133.61**
	LEC Planning Area Total	**1,739.61**	**1,757.30**	**1,813.99**	**1,863.91**	**1,923.22**	**1,963.65**	**2,006.54**

LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

Table B-33. Summary of gross water demands under 1-in-10 year drought conditions in the LEC Planning Area, by water use category.

County	Water Use Category	Demand - 1-in-10 Year Drought Conditions (mgd)						
		2015	2016	2020	2025	2030	2035	2040
Palm Beach	Public Water Supply	261.50	264.03	277.46	292.59	304.79	315.54	325.31
	Domestic and Small Public Supply	8.30	8.38	8.53	8.66	8.71	8.71	8.69
	Agricultural Irrigation	646.69	646.69	640.97	612.64	605.70	598.13	592.89
	Recreational/Landscape Irrigation	90.86	91.37	93.59	96.35	99.12	101.90	104.67
	Industrial/Commercial/Institutional	6.53	6.59	6.87	7.21	7.56	7.90	8.24
	Power Generation	16.87	16.87	16.87	16.87	16.87	16.87	16.87
	Palm Beach County Total	**1,030.75**	**1,033.93**	**1,044.29**	**1,034.32**	**1,042.75**	**1,049.04**	**1,056.67**
Broward	Public Water Supply	253.82	257.58	270.81	285.98	298.51	309.10	320.26
	Domestic and Small Public Supply	1.10	1.11	1.04	0.94	0.83	0.71	0.59
	Agricultural Irrigation	3.70	3.70	3.68	3.63	3.61	3.58	3.51
	Recreational/Landscape Irrigation	49.24	49.77	51.02	52.59	54.16	55.72	57.29
	Industrial/Commercial/Institutional	2.32	2.36	2.44	2.54	2.65	2.75	2.85
	Power Generation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Broward County Total	**310.18**	**314.53**	**328.99**	**345.68**	**359.76**	**371.86**	**384.50**
Miami-Dade	Public Water Supply	387.39	397.57	425.35	450.77	473.90	494.52	517.67
	Domestic and Small Public Supply	2.98	3.04	3.80	4.74	5.66	6.54	7.39
	Agricultural Irrigation	72.05	72.05	74.31	83.87	81.89	79.75	77.51
	Recreational/Landscape Irrigation	17.20	17.37	17.86	18.46	19.07	19.67	20.28
	Industrial/Commercial/Institutional	42.23	42.97	45.12	47.81	50.49	53.18	55.86
	Power Generation	22.88	22.88	22.88	22.88	22.88	22.88	22.88
	Miami-Dade County Total	**544.73**	**555.88**	**589.32**	**628.54**	**653.89**	**676.54**	**701.59**
Monroe	Public Water Supply	18.36	18.82	18.86	18.93	19.03	19.10	19.08
	Domestic and Small Public Supply	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Agricultural Irrigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Recreational/Landscape Irrigation	0.53	0.53	0.53	0.53	0.53	0.53	0.53
	Industrial/Commercial/Institutional	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Power Generation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Monroe County Total	**18.89**	**19.35**	**19.39**	**19.46**	**19.56**	**19.63**	**19.61**
Hendry*	Public Water Supply	0.13	0.14	0.13	0.13	0.14	0.14	0.14
	Domestic and Small Public Supply	0.40	0.40	0.41	0.42	0.43	0.43	0.44
	Agricultural Irrigation	143.15	143.15	145.74	147.52	149.66	152.20	153.15
	Recreational/Landscape Irrigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Industrial/Commercial/Institutional	0.00	0.01	0.01	0.01	0.01	0.01	0.01
	Power Generation	0.00	0.00	0.00	0.00	13.00	13.00	13.00
	Hendry County Total	**143.68**	**143.70**	**146.29**	**148.09**	**163.23**	**165.78**	**166.74**
	LEC Planning Area Total	**2,048.23**	**2,067.38**	**2,128.28**	**2,176.09**	**2,239.18**	**2,282.87**	**2,329.11**

LEC = Lower East Coast; mgd = million gallons per day.
* Values listed for Hendry County are only for the area within the LEC Planning Area boundaries.

DEMAND PROJECTIONS IN PERSPECTIVE

Table B-34 shows the 2030 average gross demands projected in the 2013 LEC Plan Update compared to the 2040 demands projected in this 2018 LEC Plan Update. Although the estimated total demand is for 10 years later, the 2040 projection in this 2018 LEC Plan Update is only 4 percent more than the estimated 2030 demand projected in the 2013 LEC Plan Update.

Table B-34. Comparison of gross water demands under average rainfall conditions at the end of the respective planning horizons in the 2013 LEC Plan Update and this 2018 LEC Plan Update.

Water Use Category	2013 LEC Plan Update 2030 Demand (mgd)	2018 LEC Plan Update 2040 Demand (mgd)
Average Rainfall Conditions		
Public Water Supply	1,007.40	1,089.34
Domestic and Small Public Supply	18.70	15.76
Agricultural Irrigation	663.90	625.27
Recreational/Landscape Irrigation	152.80	156.46
Industrial/Commercial/Institutional	56.60	66.96
Power Generation	33.30	52.75
LEC Planning Area Total	**1,932.70**	**2,006.54**
1-in-10 Year Drought Conditions		
Public Water Supply	1,104.00	1,182.45
Domestic and Small Public Supply	20.60	17.11
Agricultural Irrigation	1,332.50	827.06
Recreational/Landscape Irrigation	188.90	182.77
Industrial/Commercial/Institutional	56.60	66.96
Power Generation	33.30	52.75
LEC Planning Area Total	**2,735.90**	**2,329.11**

LEC = Lower East Coast; mgd = million gallons per day.

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C

MFLs and Recovery and Prevention Strategies

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Section 373.709, Florida Statutes (F.S.), requires each regional water supply plan to be based on at least a 20-year planning period and include, among other items, Minimum Flow and Minimum Water Level (MFL) criteria and associated recovery or prevention strategies adopted in the planning area. MFLs and recovery and prevention strategies have been adopted in the Lower East Coast (LEC) Planning Area of the South Florida Water Management District (SFWMD or District) for Lake Okeechobee, the Everglades, the Northwest Fork of the Loxahatchee River, Florida Bay, the Biscayne aquifer, and the Lower West Coast aquifers. Additional information specific to the MFL and prevention strategy adopted in 2001 for the Lower West Coast aquifers, and the water resource and supply projects that support the prevention strategy, can be found in the *2017 Lower West Coast Water Supply Plan Update* (SFWMD 2017).

LEGAL BASIS

Minimum Flows and Minimum Water Levels

The overall goal of Chapter 373, F.S., is to ensure the sustainability of water resources in Florida [Section 373.016, F.S.]. Chapter 373, F.S., provides the water management districts with several tools to carry out this responsibility, including authority to establish MFLs. MFL criteria are flows or levels at which water resources, or the ecology of the area, would experience significant harm from further withdrawals. Significant harm is defined in Subsection 40E-8.021(31), Florida Administrative Code (F.A.C.), as the temporary loss of water resource functions, which results from a change in surface water or groundwater hydrology that takes more than 2 years to recover but is considered less severe than serious harm (**Figure C-1**). Significant harm is more severe than the no-harm standard imposed during the water use permitting process, which is based on a 1-in-10-year drought level of certainty. Therefore, MFLs in a natural system would not be exceeded until rainfall conditions exceeded the 1-in-10 year drought level of certainty permitting criteria. Serious harm, the ultimate harm to the water resources contemplated under Chapter 373, F.S., is defined as long-term, irreversible, or permanent loss to water resource functions. An MFL exceedance means to fall below a minimum flow or level, which is established in Parts II and III of Chapter 40E-8, F.A.C., for a duration greater than specified for the MFL water body [Subsection 40E-8.021(17), F.A.C.].

Northeastern Florida Bay

MFL water bodies approaching their MFL threshold criteria are factors the District Governing Board considers when contemplating water shortage restrictions. However, MFL criteria are not utilized to trigger water shortage restrictions during climatic conditions less severe than a 1-in-10-year drought. The District Governing Board may impose water shortage restrictions if an MFL exceedance occurs, or is projected to occur, during climatic conditions more severe than a 1-in-10-year drought, to the extent consumptive uses contribute to such exceedance.

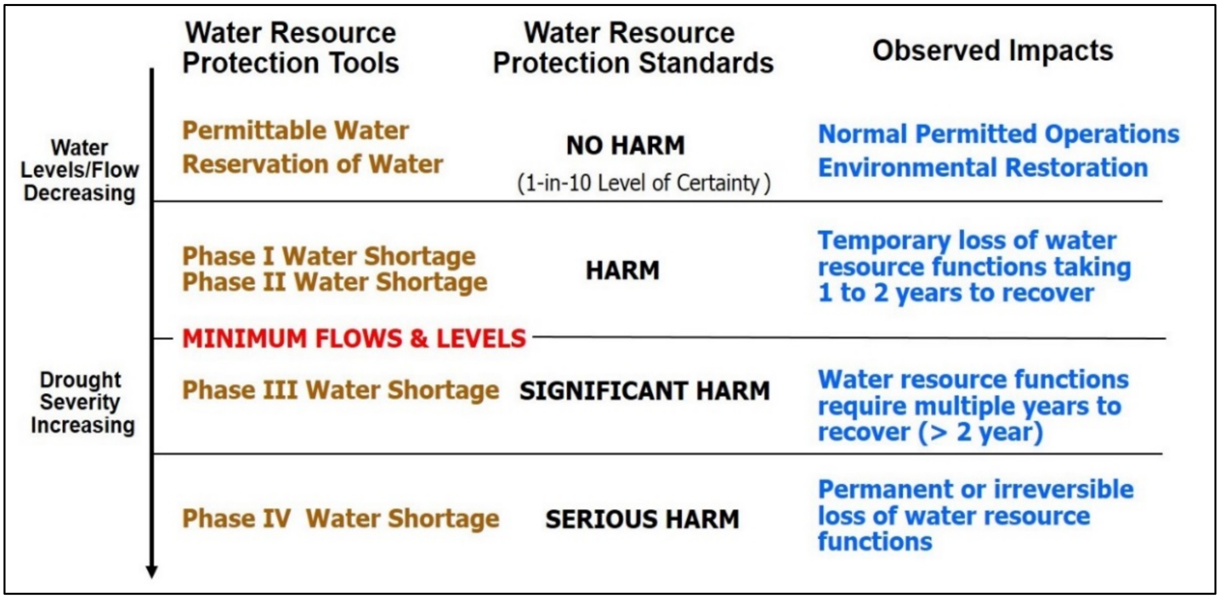

Figure C-1. Conceptual relationship among water resource protection standards at various levels of water resource harm (Modified from: Rule 40E-8.421, Florida Administrative Code).

MFL criteria are applied individually to affected water bodies and define the minimum flows or minimum water levels for surface water bodies, or the minimum water levels for groundwater in aquifers. When establishing MFLs, the District Governing Board considers changes and structural alterations to watersheds, surface waters, and aquifers as well as the effects such changes or alterations have had, and the constraints such changes or alterations have placed on the hydrology of an affected watershed, surface water body, or aquifer [Section 373.0421, F.S.].

Between 2001 and 2006, MFLs were adopted for six water bodies in the LEC Planning Area: Lake Okeechobee, the Everglades, the Northwest Fork of the Loxahatchee River, Florida Bay, the Biscayne aquifer, and the Lower West Coast aquifers (**Figure C-2**). Recovery or prevention strategies were developed and adopted, as required in Section 373.0421, F.S., for each of these water bodies simultaneously with MFL adoption.

Loxahatchee River

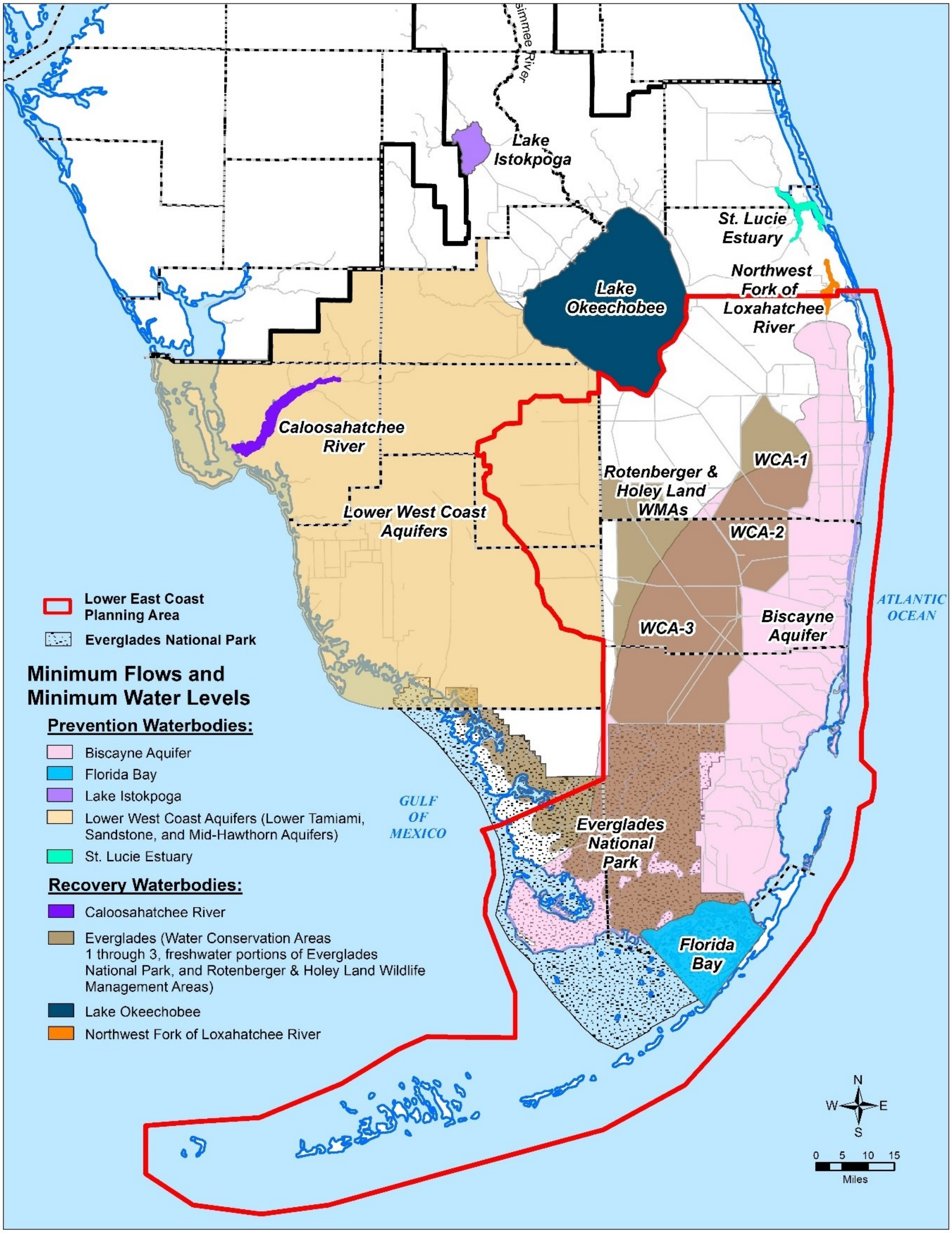

Figure C-2. Adopted Minimum Flows and Minimum Water Levels in the South Florida Water Management District.

Recovery and Prevention Strategies

Section 373.0421, F.S., requires water management districts to adopt and implement a recovery or prevention strategy for water bodies with flows or levels that are below, or are projected to fall within 20 years below, the adopted MFL criteria. Analyses of current and future conditions are conducted for each water body for which MFL criteria are defined. MFL recovery strategies are developed when MFL criteria are violated [Subsection 40E-8.021(25), F.A.C.]. MFL prevention strategies are developed when MFL criteria are not currently violated but are projected to be violated within 20 years of the establishment of the MFL [Subsection 40E-8.021(24), F.A.C.]. Section 373.709, F.S., requires regional water supply plans to contain recovery and prevention strategies needed to achieve compliance with MFLs during the planning period. The recovery or prevention strategy must include a list of projects that develop additional water supplies and other actions. The phasing or timetable for each project must be included in the strategy. Section 373.0421(2), F.S. provides the following:

> *The recovery or prevention strategy must include a phased-in approach or a timetable which will allow for the provision of sufficient water supplies for all existing and projected reasonable-beneficial uses, including development of additional water supplies and implementation of conservation and other efficiency measures concurrent with and, to the maximum extent practical, to offset reductions in permitted withdrawals, consistent with this chapter.*

Recovery and prevention strategies can consist of multiple components, including capital projects, regulatory measures and requirements, water shortage measures, environmental projects, and other research and monitoring. These components may include development of additional water supplies and implementation of conservation and other efficiency measures. Projects will develop existing water sources or replace them with alternative water supplies to provide sufficient water for all existing and projected reasonable-beneficial uses, consistent with Section 373.0421, F.S.

In the LEC Planning Area, recovery strategies were developed and adopted for Lake Okeechobee, the Everglades, and the Northwest Fork of the Loxahatchee River [Subsections 40E-8.421(2) and (6), F.A.C.]. Prevention strategies were developed and adopted for the Biscayne aquifer, the Lower West Coast aquifers, and Florida Bay [Subsections 40E-8.421(3), (4), and (8), F.A.C.]. The MFL for the Lower West Coast aquifers affects a portion of the LEC Planning Area but is included in the *2017 Lower West Coast Water Supply Plan Update* (SFWMD 2017). Capital projects that provide water supplies for MFL water bodies in the LEC Planning Area are listed in **Table C-1**.

TOOLS	
MFL Recovery and Prevention Strategy Components	
Capital Projects	Capital projects include the planning, design, permitting, and construction of features to provide water to meet MFL criteria. The scale of these projects can range from relatively simple water control structures or conveyance improvements to large, regionally important features such as reservoirs, water preserve areas, or wetlands. Many of these projects are established through cost-share agreements or other partnerships among multiple agencies to provide funding and direction that would be impossible for a single agency to support.
Regulatory Measures and Requirements	When a recovery strategy has been established for an MFL water body, existing permitted allocations will not be modified or revoked prior to permit expiration unless the permitted use changes or a new or alternative source is in place and operating to supply the water historically provided from the MFL water body. For new water use permit applications, applicants are required to comply with all conditions of issuance. When existing permits are renewed or modified, the modifications are based on conditions at issuance. The rules implementing water resource protection tools, including Chapters 40E-2 and 40E-8, F.A.C., and the *Applicant's Handbook for Water Use Permit Applications within the South Florida Water Management District* (Applicant's Handbook; SFWMD 2015), identify the specific factors and constraints that will be applied to evaluate consumptive uses proposing to withdraw from MFL water bodies.
Water Shortage Measures	The SFWMD may impose water shortage restrictions to curb water use withdrawals pursuant to Sections 373.175 and 373.246, F.S. The SFWMD implements its water shortage authority by restricting water uses based on the concept of shared adversity between users and the water resources [Chapters 40E-21 and 40E-22, F.A.C.]. Under this program, different phases of water shortage restrictions with varying levels of cutbacks are imposed relative to drought conditions. The four phases of water shortage restrictions are based on progressively increasing resource impacts leading up to serious harm. Under the current program, Phases I and II primarily reduce water use through conservation techniques and minor use restrictions that affect all users. While each phase has cutbacks for irrigated lands, Phases III and IV require use cutbacks associated with increased likelihood of more significant economic impact to the users such as the potential for crop loss and turf damage due to irrigation restrictions. Established MFLs are considered in the evaluation of current water conditions [Paragraph 40E-21.221(3)(d), F.A.C.] and as one of the criteria for imposing water use restrictions [Paragraph 40E-21.271(3)(d), F.A.C.]. This plan update, and Chapter 40E-8, F.A.C., do not propose use of Chapter 40E-21, F.A.C., as an MFL recovery strategy. However, when a drought occurs, the SFWMD will rely on the water shortage plan of Chapter 40E-21, F.A.C., as needed to address regional system water availability. To the extent practicable, the SFWMD attempts to implement water deliveries to reduce or prevent MFL criteria from being exceeded. For example, Lake Okeechobee operational guidelines needed to implement water supply deliveries to avoid MFL exceedances, in concert with meeting other required water demands, are identified in the *Final Adaptive Protocols for Lake Okeechobee Operations* (SFWMD 2010).
Environmental Projects and Other Research and Monitoring	Operational protocols and habitat enhancement projects are implemented to improve flows and levels, mitigate impacts from flow or level extremes, and protect key habitats. Periodic assessment of flows and levels as well as monitoring vegetation and infaunal populations, and other research and monitoring, may be included to assess the effects of MFLs and ensure sufficient water is available from the regional system to meet the MFL.

Table C-1. Capital projects that provide water supplies supporting Minimum Flow and Minimum Water Level water bodies in the LEC Planning Area.

MFL Water Body	Capital Project	Project Objectives and Description	Lead Agency	Lead Program	Project Partners	2018 Status
Biscayne Aquifer	Broward County Secondary Canal System	Reduce water shortages in local wellfields and stabilize the saltwater interface by pumping excess water from the C-9, C-12, and C-13 canal basins into the coastal canal systems to maintain canal stages at optimum levels. Includes drawing water from other sources such as the Site 1 Impoundment (Fran Reich Preserve Reservoir) and North Lake Belt Storage Area, Lake Okeechobee, and the WCAs when basin water is insufficient. Also includes a series of water control structures, pumps, and canal improvements in the C-9, C-12, and C-13 canal basins and the east basin of the North New River Canal in central and southern Broward County.	SFWMD	CERP	USACE; Broward County	Project inactive.
Everglades	Western Everglades Restoration Project	Improve the quantity, quality, timing, and distribution of water in the western Everglades. Includes active and passive features and alterations to existing canals and levees to re-establish connectivity of wetland and upland habitats in the western Everglades with restored freshwater flow paths, flow volumes and timing, seasonal hydroperiods, and historical distributions of sheetflow across a portion of the Seminole Tribe of Florida Big Cypress Reservation and into Big Cypress National Preserve.	USACE	CERP	SFWMD	In planning.
Everglades and Biscayne Aquifer	Broward County Water Preserve Areas: C-11 Impoundment, C-9 Impoundment, and WCA-3A/3B Seepage Management Projects	Capture and store rainwater, reduce phosphorus and other nutrients entering the Everglades, reduce seepage out of the Everglades, increase urban drinking water supplies, reduce saltwater intrusion, and increase the spatial extent of wetlands in South Florida. Project area is in Broward County, at the eastern extent of WCA-3A/3B, and within the limits of Weston, Pembroke Pines, Miramar, and Southwest Ranches.	USACE	CERP	SFWMD; Broward County	Initiated utility relocation on C-11 Impoundment; initiated construction on the Mitigation Area A Berm.
Everglades and Biscayne Aquifer	Site 1 Impoundment (Fran Reich Preserve Reservoir)	Retain water in the natural system by reducing seepage from adjacent natural areas, capture and store water currently discharged as seepage, provide groundwater recharge, and help prevent saltwater intrusion. Includes an above-ground reservoir with a total storage capacity of approximately 13,200 acre-feet in the Hillsboro Canal Basin in southern Palm Beach County.	USACE	CERP	SFWMD	Phase 1 components complete. Phase 2 components on hold pending additional congressional authorization.

MFL Water Body	Capital Project	Project Objectives and Description	Lead Agency	Lead Program	Project Partners	2018 Status
Everglades and Florida Bay	C-111 South Dade Project	Improve hydrologic conditions in Taylor Slough, its headwaters (Rocky Glades), and the eastern panhandle of ENP and increase freshwater flows to northeastern Florida Bay. Includes construction of a detention and buffer system with three pump stations (S-332B, S-332C, and S-332D) and three detention areas, and acquisition of required land in the Rocky Glades, Frog Pond, and Southern Glades areas.	USACE	South Florida Ecosystem Restoration Program	SFWMD	In construction; study initiated to replace S-332B and S-332C temporary pump stations.
Everglades and Florida Bay	C-111 Spreader Canal Project – Phase 1 (Western)	Improve the quantity, timing, and distribution of freshwater flows to Florida Bay and restore wetland habitat functions to freshwater wetlands and estuaries adjoining Florida Bay by reducing seepage from Taylor Slough. Includes a 530-acre infiltrating detention area in the Frog Pond area, a 225-cfs pump station (S-200) downstream of S-176, a second linear infiltration feature, a 225-cfs pump station (S-199) immediately upstream of S-177, a plug in the L-31E Canal near S-20A, 10 plugs in the C-110 Canal, weirs in the Aerojet Road Canal, and potential operational modifications at the S-18C and S-20 structures.	USACE	CERP	SFWMD	Constructed and operational since 2012. Increases pump capacity at S-200 and S-199.
Everglades, Florida Bay, and Biscayne Aquifer	C-111 Spreader Canal Project – Phase 2 (Eastern)	Rehydrate and improve ecological conditions in the Southern Glades and Model Lands at shallow depth and low velocity; improve sheetflow to ENP, northeastern Florida Bay, and the Biscayne Bay Aquatic Preserve; and maintain a barrier to saltwater intrusion into the Biscayne aquifer. Alternatives include backfilling the lower C-111 Canal and/or replacing existing portions of the lower C-111 Canal with a spreader canal.	USACE	CERP	SFWMD	In planning and land acquisition; pending additional congressional authorization.
Everglades and Florida Bay	Central Everglades Planning Project (CEPP)[a]	Capture water lost to tide and improve the quantity, quality, timing, and distribution of water flows south to the central Everglades (WCA-3A/3B), ENP, and Florida Bay. Includes water storage, treatment, and conveyance south of Lake Okeechobee; removal of canals and levees; and construction of seepage management features to protect developed areas from the increased flow of water through the central portion of the system.	USACE	CERP	SFWMD	L-31N pilot project complete; detailed design complete for S-333N project; Old Tamiami Trail removal is ongoing; A-2 Reservoir/stormwater treatment area authorized.
Everglades and Florida Bay	Modified Water Deliveries to ENP	Deliver more water to Northeast Shark River Slough in ENP from WCA-3. Includes conveyance and seepage control features, Tamiami Trail modifications, and an 8.5-square-mile flood mitigation plan.	USACE	N/A	USDOI	Constructed and operational.

MFL Water Body	Capital Project	Project Objectives and Description	Lead Agency	Lead Program	Project Partners	2018 Status
Lake Okeechobee	Lake Okeechobee Watershed Restoration Project	Capture, store, and redistribute water entering the northern part of Lake Okeechobee to improve lake levels and the quantity and timing of discharges to the Caloosahatchee and St. Lucie estuaries; restore wetlands and re-establish connections among natural areas that have become spatially and/or hydrologically fragmented; increase the quantity and quality of native wildlife habitat and vegetation; and improve existing and future water supply. The project benefits five sub-basins (approximately 950,000 acres) within the Lake Okeechobee watershed, Lake Okeechobee, and the St. Lucie and Caloosahatchee estuaries in Okeechobee, Glades, Highlands, and Martin counties.	USACE	CERP	SFWMD	Project Implementation Report approved; tentatively selected dates for meeting milestones met.
Northwest Fork of Loxahatchee River	G-160 and G-161 Structure Projects	Restore the natural hydroperiod and provide additional water to Loxahatchee Slough. Includes construction of the G-160 and G-161 structures.	USACE	CERP	SFWMD	Constructed and operational.
Northwest Fork of Loxahatchee River	Loxahatchee River Watershed Restoration Project	Restore connectivity of the headwaters and provide restoration flows to the Northwest Fork of the Loxahatchee River. Includes the Pal Mar and J.W. Corbett Wildlife Management Area Hydropattern Restoration project; L-8 Basin modifications; the C-51 Reservoir and L-8 flow equalization basin; flow-way features in the L-8, C-18, and Loxahatchee tributary basins (Cypress, Kitching, and Moonshine creeks); and consideration of aquifer storage and recovery technology. The L-8 Reservoir has been repurposed to address water quality issues and though it may be made available on an interim basis to provide deliveries to the river, permanent storage solutions such as the designated C-18 Impoundment replacement feature and/or Alternative L-8 Basin Storage will be considered.	USACE	CERP	SFWMD	Plan scope, schedule, and budget approved; continued planning effort to refine modeling tools and performance measures.

CEPP = Central Everglades Planning Project; CERP = Comprehensive Everglades Restoration Plan; cfs = cubic feet per second; ENP = Everglades National Park; MFL = Minimum Flow and Minimum Water Level; N/A = not applicable; SFWMD = South Florida Water Management District; USACE = United States Army Corps of Engineers; USDOI = United States Department of the Interior; WCA = Water Conservation Area.

[a] CEPP includes six components of CERP (USACE 2014): Everglades Agricultural Storage Reservoirs; WCA-3 Decompartmentalization and Sheetflow Enhancement; S-356 Pump Station Modifications; L-31N Improvements for Seepage Management; System-wide Operational Changes – Everglades Rain-Driven Operations; and Flow to Northwest and Central WCA-3A. Specific CEPP projects within these components can be found in the *CEPP Project Fact Sheet* (USACE 2018a).

LOWER EAST COAST MFL WATER BODIES

Lake Okeechobee

MFL Criteria

Lake Okeechobee

Lake Okeechobee (**Figure C-2**) is the largest lake in the southeastern United States and a central component of the hydrology and environment of South Florida. Lake Okeechobee is used for multiple purposes, including urban, agricultural, and environmental water supply; flood control; navigation; and commercial and recreational fishing. The lake also is a key ecological component of the Greater Everglades ecosystem. It receives water from a 3.46-million-acre watershed that includes the Kissimmee Chain of Lakes, Kissimmee River, Lake Istokpoga, Fisheating Creek, and other drainage basins. The lake has two major outlets for flood control and water delivery to downstream rivers and estuaries: the C-44 (St. Lucie) Canal to the east and the C-43 Canal, leading to the Caloosahatchee River, to the west. Water also can be delivered south to the Everglades Protection Area. Additional flood control discharges from Lake Okeechobee to the LEC Planning Area are possible via the West Palm Beach, Hillsboro, North New River, and Miami canals. The 143-mile long Herbert Hoover Dike encircles the lake to protect surrounding communities from flooding (United States Army Corps of Engineers [USACE] 2018b).

An MFL of 11 feet National Geodetic Vertical Datum of 1929 (NGVD29) was adopted for Lake Okeechobee in 2001 [Subsection 40E-8.221(1), F.A.C.]. The MFL criterion was based on the relationship between water levels in the lake and the lake's ability to 1) protect the coastal portion of the surficial aquifer system against saltwater intrusion, 2) supply water to Everglades National Park, 3) provide littoral zone habitat for fish and wildlife, and 4) ensure navigational and recreational access (SFWMD 2000a). Consideration was given to the lake's function as a storage area for supplying water to adjacent areas such as the Everglades Agricultural Area, the Seminole Tribe of Florida reservations, and the Lake Okeechobee Service Area.

An MFL exceedance occurs when the water level in Lake Okeechobee falls below 11 feet NGVD29 for more than 80 consecutive or non-consecutive days during an 18-month period. The 18-month period over which MFL compliance is assessed starts following the first day the lake level falls below 11 feet NGVD29 and cannot include more than one wet season (May 31 through October 31) of any given calendar year. An MFL violation occurs when an exceedance occurs more than once every 6 years.

Revised Lake Okeechobee Regulation Schedule Effects

An analysis was conducted in 2000 to determine whether the proposed Lake Okeechobee MFL criterion could be expected to be violated over the next 20 years. This information was needed to assess whether a prevention or recovery strategy would be needed for Lake Okeechobee. The South Florida Water Management Model was used to evaluate the proposed MFL criterion in 5-year increments through 2020. The analysis considered projected growth in water use demands on the lake, the scheduled delivery and performance of the Central and Southern Florida Flood Control Project (C&SF Project) components (USACE and SFWMD 1999), and the Water Supply and Environment regulation schedule proposed for the lake. Details regarding the modeling analysis are available in the *2000 Lower East Coast Regional Water Supply Plan* (SFWMD 2000b).

Under these assumptions, the SFWMD found the proposed Lake Okeechobee MFL criterion would not be violated and existing as well as projected users would have a 1-in-10 year drought level of certainty provided the water shortage trigger line for Lake Okeechobee that existed in 2000 [Chapter 40E-22, F.A.C.] was lowered 0.50 feet. The proposed Water Supply and Environment regulation schedule was adopted by the USACE in July 2000. The Lake Okeechobee MFL and prevention strategy were adopted in 2001.

However, in response to a series of hurricanes, high lake level events, and resulting high discharges to the Caloosahatchee and St. Lucie estuaries in 2004 and 2005, the USACE initiated a process to revise the Water Supply and Environment regulation schedule to improve management of Lake Okeechobee during high water conditions. In July 2007, after extensive public participation, the USACE published the *Final Environmental Impact Statement Including Appendices A through G – Lake Okeechobee Regulation Schedule* (USACE 2007). The goals of the Lake Okeechobee Regulation Schedule were later amended to address public health and safety concerns related to the structural competency of the Herbert Hoover Dike. The USACE approved the 2008 Lake Okeechobee Regulation Schedule (2008 LORS) on April 28, 2008.

With implementation of the 2008 LORS, water levels within Lake Okeechobee were lowered and MFL violations were projected to occur. As a result, it became necessary to change the prevention strategy for the lake to a recovery strategy [Subsection 40E-8.421(2), F.A.C.]. See SFWMD Order No. SFWMD 2008 – 364-DAO-WU (SFWMD 2008) for background information. The current Integrated Delivery Schedule (USACE 2018c) indicates completion of the Herbert Hoover Dike rehabilitation by 2022 and evaluation of a revision of the 2008 LORS beginning in 2019. Additional water from Lake Okeechobee resulting from operational changes or a revised regulation schedule is expected to return the lake to an MFL prevention strategy.

Recovery Strategy

The Lake Okeechobee MFL recovery strategy consists of four components:

- Environmental enhancement projects to be implemented during extreme low lake stages;
- Regulatory constraints on consumptive use of lake water;
- Water shortage restrictions as described in Chapter 40E-22, F.A.C.; and
- Capital projects that improve storage capacity both within and adjacent to the lake.

Environmental enhancements in and around the lake, such as native vegetation planting, controlled burns, and sediment scraping, are conducted during low water conditions (**Table C-2**).

Table C-2. Environmental enhancement components of the Lake Okeechobee recovery strategy.

Lake Level	Activity	Benefits
At 11 feet NGVD29 and stage is falling	Conduct sediment scraping and other habitat enhancements, including removal of tussocks and other aggregations of organic material.	Promote natural compaction, removal, and/or oxidation of accumulated organic muck sediments. Remove barriers to fish migration in and out of the western littoral zone.
At or below 11 feet NGVD29	Conduct controlled burns if fuel load and weather conditions permit.	Facilitate removal of exotic species, such as torpedograss (*Panicum repens*).
Below 11 feet NGVD29	Allow maintenance and repair work on public boat ramps and docking and marina facilities.	Restore original design depth of the waterways and provide navigable access.
At 10.5 feet NGVD29 and stage is falling	Plant native terrestrial and emergent vegetation, such as bulrush (*Scirpus* spp.) (if a method for re-establishment proves to be feasible), native pond apples (*Annona glabra*), and cypress trees (*Taxodium distichum*) on the southern shore islands and on rim canal spoil islands.	Re-establish native trees on the islands to prevent expansion of exotic and invasive vegetation, and provide essential habitat for wading birds, raptors, and endangered species, such as the Everglade snail kite (*Rostrhamus sociabilis*) and Okeechobee gourd (*Cucurbita okeechobeensis*).
Between 10 and 11 feet NGVD29 and stage is rising	Plant native submerged and emergent vegetation species, such as bulrush.	Re-establish native plant species, which can prevent the expansion of exotic and invasive vegetation; assist in restoring fish and wildlife habitats; prevent uprooting of emergent and submerged plants; and reduce turbidity, which promotes and maintains submerged aquatic vegetation growth.
At 11 feet NGVD29 and stage is rising	Assess the feasibility of introducing apple snail (*Pomacea paludosa*) populations via an apple snail hatchery or other techniques.	Supplement native apple snail populations for the endangered Everglades snail kite.
Lake stage-independent components	Investigate sediment management strategies in the tributaries and pelagic zone of the lake.	Remove phosphorus-laden sediment that could be resuspended and reduce light transparency, which discourages submerged vegetation growth and encourages phytoplankton bloom activity.

NGVD29 = National Geodetic Vertical Datum of 1929.

Regulatory constraints include the 2008 establishment of the Lake Okeechobee Service Area Restricted Allocation Area (RAA) (**Chapter 4**). Net increases in the volume of surface water withdrawn from the RAA are prohibited over that resulting from base condition water uses occurring from April 1, 2001 to January 1, 2008.

Implementation of the 2008 LORS was anticipated to result in more frequent and severe lake-based water shortages. To address this, the SFWMD changed the water shortage rules pertaining to Lake Okeechobee [Chapter 40E-21, F.A.C.] in November 2007 to clarify how water deliveries would be calculated and applied to agricultural uses within the Lake

Okeechobee basin. Water shortage restrictions, Phases I through III or greater, may be imposed by the District Governing Board based on the presence of water shortage trigger levels in Lake Okeechobee [Subsection 40E-22.332, F.A.C.]. These water shortage restrictions apply to withdrawals of surface water from 1) the Lake Okeechobee region, as described in Subsection 40E-21.691(3), F.A.C.; and 2) the Brighton and Big Cypress reservations, in accordance with the terms of the Water Rights Compact Among the Seminole Tribe of Florida, the State of Florida, and the SFWMD ("Seminole Compact") [Subsections 40E-22.312 and 40E-22.322, F.A.C.].

Capital projects that support the Lake Okeechobee MFL and recovery strategy are described in **Table C-1**. Many of the projects have been established through cost-share agreements or other partnerships, including the Comprehensive Everglades Restoration Plan (CERP).

Everglades

MFL Criteria

Historically, the Everglades was a system of naturally interconnected sloughs and rivers collectively flowing to the southern coast of Florida. The Everglades has been highly impacted by human-induced alterations in the watershed that have disrupted the natural course of water flow. Extensive efforts are under way as part of CERP to restore more natural flow and movement of water into, within, and from the Everglades and downstream waters.

To protect water supplies for the Everglades, an MFL rule was adopted in 2001 [Subsection 40E-8.221(3), F.A.C.]. The Everglades MFL covers the lands and waters of the water conservation areas (WCAs), Holey Land and Rotenberger wildlife management areas, and the freshwater portions of Everglades National Park [Subsection 40E-8.021(7), F.A.C.] (**Figure C-2**). The SFWMD considered the effects of water levels on hydric soils, plant and wildlife communities, and the frequency and severity of fires when developing the MFL criteria (SFWMD 2000a). Impacts associated with significant harm include increased peat oxidation, frequency of severe fires, soil subsidence, loss of aquatic refugia, loss of tree islands, and long-term changes in vegetation or wildlife habitat. The Everglades MFL criteria were based on protecting the two dominant soil types found within the ecosystem, peat- and marl-forming wetlands. Wetlands overlying organic peat soils (i.e., peatlands) are found within the WCAs, Holey Land and Rotenberger wildlife management areas, and Shark River Slough in Everglades National Park. Marl-forming wetlands are located east and west of Shark River Slough, Rocky Glades, and Taylor Slough, which are within Everglades National Park.

The MFL criteria for the Everglades are a set of minimum levels that 1) are based on changes and structural alterations to the pre-drainage conditions of the Everglades that existed at the time of MFL adoption; 2) are specific to the peat- and marl-forming wetlands of the WCAs, Holey Land and Rotenberger wildlife management areas, Shark River Slough, wetlands east and west of Shark River Slough, Rocky Glades, and Taylor Slough; and 3) specify limits on the decline of water levels below ground, under specific conditions and at specific return frequencies, as measured at the locations shown in **Figure C-3** [interpreted from Subsection 40E-8.221(3), F.A.C.] and listed in **Table C-3**.

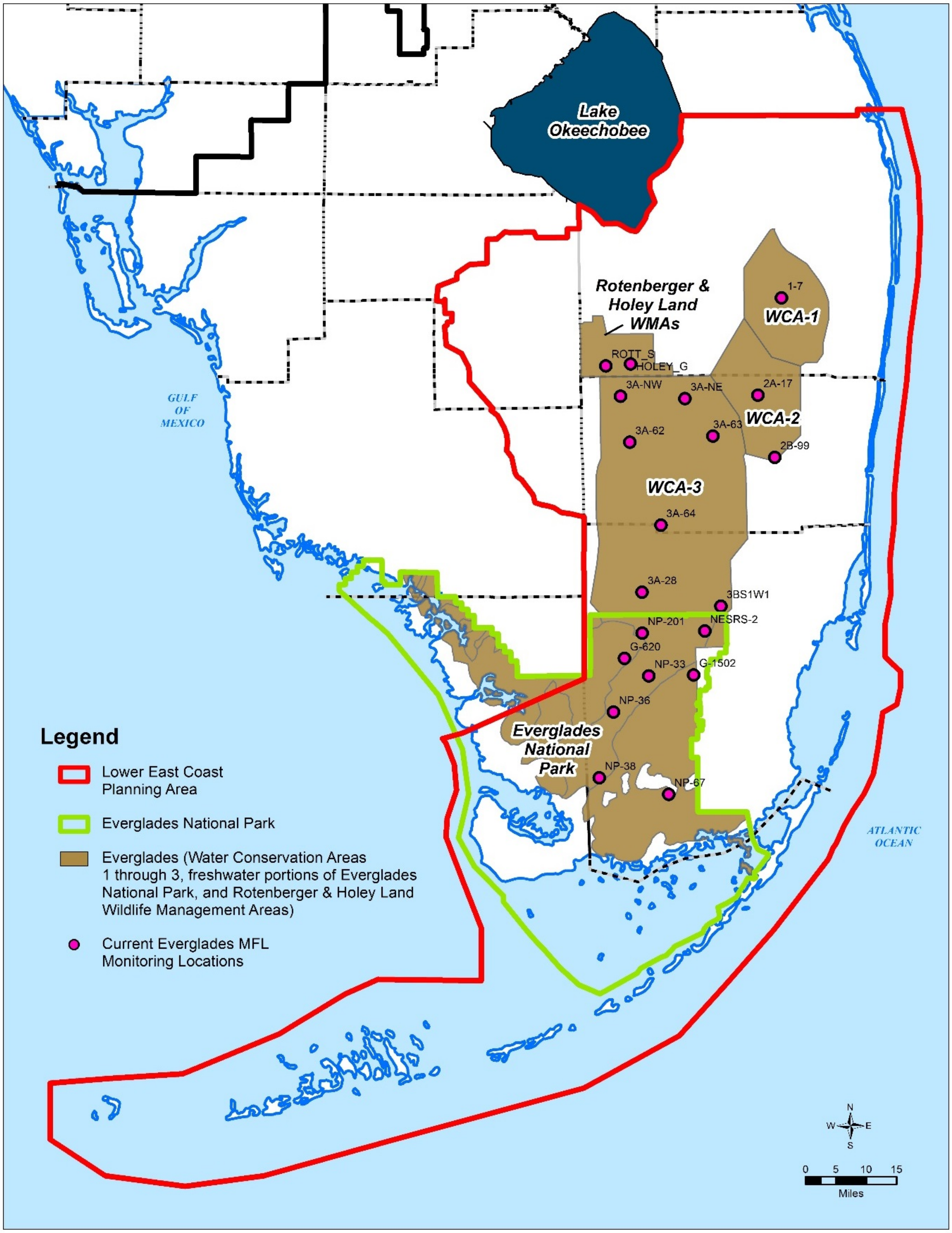

Figure C-3. Everglades Minimum Flow and Minimum Water Level (MFL) monitoring locations (current key gauges).

Table C-3. Minimum water levels, duration, and return frequencies for key water management gauges within the Everglades (Adapted from: Table 1 of Chapter 40E-8, F.A.C.).

Area	Current Key Gauge	Original Key Gauge	Soil Type	Minimum Depth and Duration	Return Frequency
WCA-1	1-7	1-7	Peat	-1.0 foot > 30 days	1-in-4 years
WCA-2A	2A-17	2A-17	Peat	-1.0 foot > 30 days	1-in-4 years
WCA-2B	2B-99[a]	2B-21	Peat	-1.0 foot > 30 days	1-in-3 years
WCA-3A North	3A-NE	3A-NE	Peat	-1.0 foot > 30 days	1-in-2 years
WCA-3A North	3A-NW	3A-NW	Peat	-1.0 foot > 30 days	1-in-4 years
WCA-3A North	3A-62[a]	3A-2	Peat	-1.0 foot > 30 days	1-in-4 years
WCA-3A North	3A-63[a]	3A-3	Peat	-1.0 foot > 30 days	1-in-3 years
WCA-3A Central	3A-64[a]	3A-4	Peat	-1.0 foot > 30 days	1-in-4 years
WCA-3A South	3A-28	3A-28	Peat	-1.0 foot > 30 days	1-in-4 years
WCA-3B	3BS1W1[a]	3B-SE	Peat	-1.0 foot > 30 days	1-in-7 years
Rotenberger Wildlife Management Area	Rotts	Rotts	Peat	-1.0 foot > 30 days	1-in-2 years
Holey Land Wildlife Management Area	HoleyG	HoleyG	Peat	-1.0 foot > 30 days	1-in-3 years
Northeast Shark River Slough	NESRS-2	NESRS-2	Peat	-1.0 foot > 30 days	1-in-10 years
Central Shark Slough	NP-33	NP-33	Peat	-1.0 foot > 30 days	1-in-10 years
Central Shark Slough	NP-36	NP-36	Peat	-1.0 foot > 30 days	1-in-7 years
Marl wetlands east of Shark River Slough	NP-38	NP-38	Marl	-1.5 foot > 90 days	1-in-3 years
Marl wetlands west of Shark River Slough	NP-201	NP-201	Marl	-1.5 foot > 90 days	1-in-5 years
Marl wetlands west of Shark River Slough	G-620	G-620	Marl	-1.5 foot > 90 days	1-in-5 years
Rockland marl marsh	G-1502	G-1502	Marl	-1.5 foot > 90 days	1-in-2 years
Taylor Slough	NP-67	NP-67	Marl	-1.5 foot > 90 days	1-in-2 years

[a] Monitoring locations have been updated to alternative gauges since rule adoption due to changed conditions at the original gauge or location making continued monitoring impossible there.

MFL exceedances (**Table C-3**, Minimum Depth and Duration) and violations (**Table C-3**, Return Frequency) occur when the MFL criteria [Subsection 40E-8.221(3), F.A.C], regarding water levels below ground at the monitoring locations depicted in **Table C-3** and **Figure C-3**, are not met. Pursuant to Subsection 40E-8.221(3), F.A.C, the SFWMD is implementing measures contained in the LEC water supply plan updates and CERP to achieve minimum hydropattern return frequencies that approximate CERP-compatible pre-drainage conditions in the Everglades.

Recovery Strategy

At the time of MFL adoption, the Everglades did not meet the MFL criteria due to a lack of regional water storage, the regulation schedule, and ineffective water drainage and distribution infrastructure in the watershed. Although not all locations within the Everglades were in violation of the MFL, a recovery strategy [Subsection 40E-8.421(2), F.A.C.] was adopted simultaneously with MFL adoption. The Everglades MFL recovery strategy includes the following components:

- Capital projects, including CERP projects, to restore more natural water movement within the ecosystem, and;
- Lower East Coast Everglades Waterbodies RAA.

Since 2001 and the advent of CERP, many structural and non-structural remedies necessary for the recovery of the Everglades have been completed, are ongoing, or are planned. CERP has a critical relationship with water supply planning and includes capital projects needed for the recovery and restoration of the Everglades. The Central Everglades Planning Project (CEPP) includes projects on publicly owned land to direct more water south to WCA-3, Everglades National Park, and Florida Bay, while providing for other water-related needs of the region. **Table C-1** lists capital (structural) projects supporting the Everglades recovery strategy.

An RAA can serve as a non-structural component of a recovery or prevention strategy. An RAA was established in 2007 for the Lower East Coast Everglades Waterbodies (**Chapter 4**) and is a component of the Everglades recovery strategy. Net increases in the volume or changes in timing on a monthly basis of direct surface water and indirect groundwater withdrawals from the RAA are prohibited over that resulting from base condition uses permitted as of April 1, 2006.

Northwest Fork of the Loxahatchee River

MFL Criteria

The Loxahatchee River is in Martin and Palm Beach counties (**Figures C-2** and **C-4**), and it flows into the Atlantic Ocean through Jupiter Inlet. The river generally is regarded as the last free-flowing river in southeastern Florida. Approximately 7.6 miles of the river's Northwest Fork were designated as Florida's first Wild and Scenic River in 1985 (United States Fish and Wildlife Service 2018). Downstream segments of the Northwest Fork floodplain contain dense red mangrove forest, while the upper segment contains one of the last native cypress river swamps in southeastern Florida. Over the past century, downstream floodplain wetlands once dominated by swamp hardwoods and bald cypress have changed to mangrove-dominated swamp. This change in vegetation is believed to have occurred because of saltwater intrusion into freshwater areas of the river, caused primarily by human-induced alteration of the watershed and river.

To protect freshwater flows in the Northwest Fork, an MFL was adopted for it in 2003 [Subsection 40E-8.221(4), F.A.C.]. The MFL criteria are a minimum flow of 35 cubic feet per second (cfs) over Lainhart Dam and an average daily salinity of less than 2 at river mile 9.2. An MFL exceedance occurs when 1) flows decline below 35 cfs for more than 20 consecutive days; or 2) salinity, expressed as 20-day rolling average, is greater than 2 at river mile 9.2. An MFL violation occurs when an exceedance occurs more than once in a 6-year period.

The MFL criteria protect the freshwater floodplain swamp of the Northwest Fork. The designation of the Northwest Fork as a National Wild and Scenic River identified the floodplain swamp and its associated cypress forest as a resource of outstanding value that needs to be protected. Because cypress trees tolerate a wide range of salinity conditions and are slow to respond to salinity stress, an assemblage of six freshwater tree species that, as a group, are a more sensitive indicator of adverse salinity conditions was identified as characterizing the floodplain swamp (SFWMD 2002).

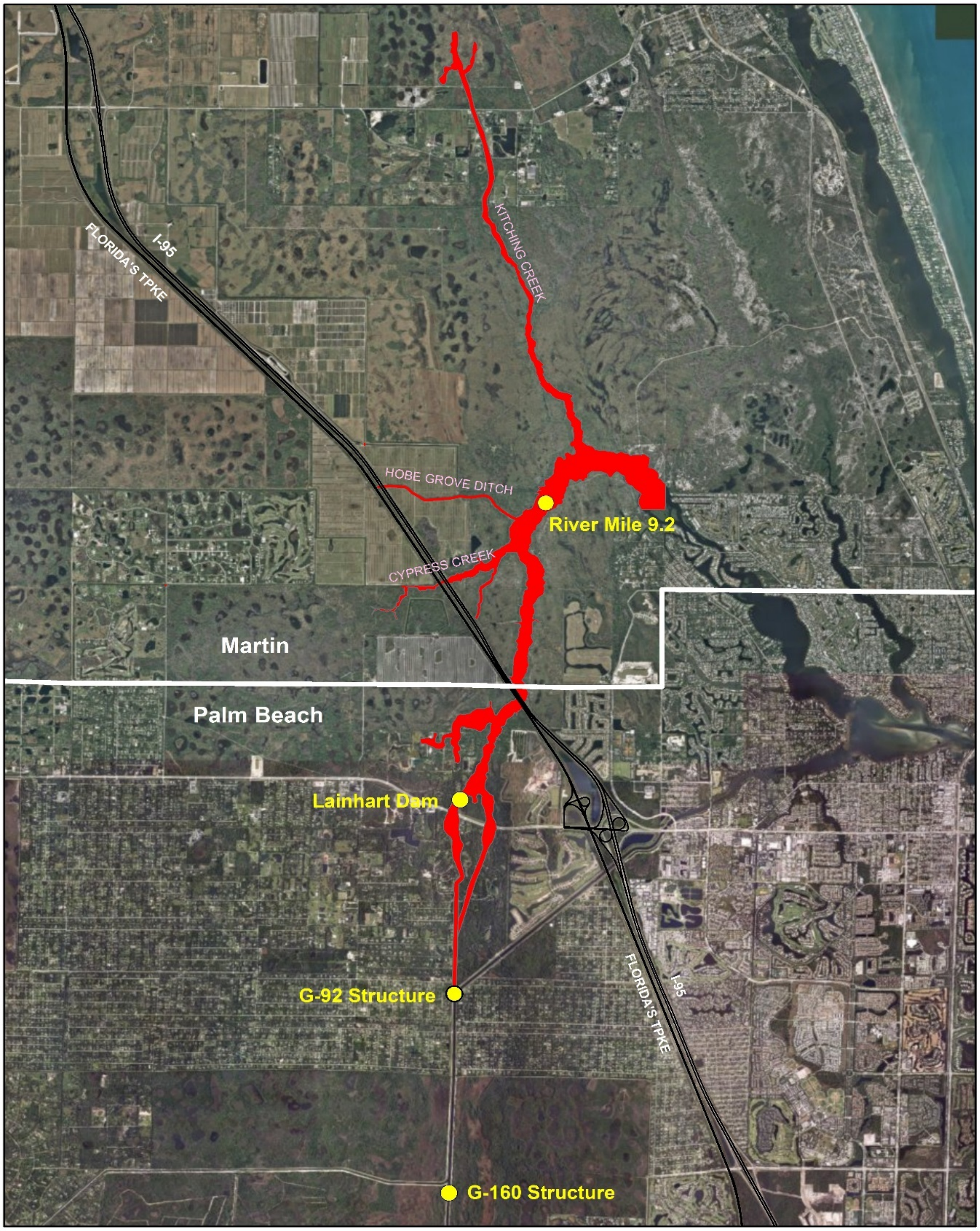

Figure C-4. Northwest Fork of the Loxahatchee River Minimum Flow and Minimum Water Level area (shown in red).

Recovery Strategy

The Northwest Fork of the Loxahatchee River was not meeting the MFL criteria at the time of adoption. Therefore, an MFL recovery strategy [Subsection 40E-8.421(6), F.A.C.] was adopted simultaneously with the MFL adoption. The recovery strategy includes the following components:

- Structural Improvements – Construction of projects and facilities to increase water storage and delivery capabilities.
- Operational Protocols – Providing flows from Lainhart Dam and other sources to meet the MFL (35 cfs) as well as restorative flows greater than 50 cfs.
- Regulatory Activities – SFWMD regulatory program and water shortage plans to ameliorate low-flow conditions.

Structural and operational features of the recovery strategy are implemented through ongoing water resource development projects. Current projects that support the Northwest Fork MFL are listed in **Table C-1**. The Northwest Fork MFL criteria are anticipated to be met when these projects are completed and fully operational.

Key components for managing the Loxahatchee River are continuous salinity monitoring at river mile 9.2 (**Figure C-4**), measuring flow across Lainhart Dam, and periodically assessing vegetative communities in the floodplain. This information is used in the operation of water control facilities to deliver a flow of 50 cfs to the river when sufficient water is available from the regional system. This operational strategy is meant to reduce the upstream migration of salt water into the Northwest Fork of the river.

A major step towards restoration of the Northwest Fork, the Loxahatchee River Watershed Restoration Project is a CERP project jointly conducted by the USACE and SFWMD through a partnership agreement (**Figure C-5**). The project is expected to help 1) restore more natural water deliveries; 2) promote improved health and functionality of wetland and upland areas; and 3) increase the quantity and quality of habitat available for native wildlife and vegetation by improving water distribution and timing, rehydrating hydrologically impacted natural areas, and re-establishing connections among natural areas that have become fragmented (USACE 2018d). The project area encompasses approximately 481,920 acres of central and northern Palm Beach County and southern Martin County, including Jonathan Dickinson State Park, Pal Mar East/Cypress Creek, Dupuis Wildlife and Environmental Management Areas, J.W. Corbett Wildlife Management Area, Grassy Waters Preserve, Loxahatchee Slough, the last remaining riverine cypress stands in Southeast Florida in the Loxahatchee River, and the Loxahatchee River Estuary.

To ensure the water needed for restoration of the Loxahatchee River is available, an RAA was established in 2007 for the North Palm Beach County/Loxahatchee River Watershed Waterbodies (**Chapter 4**). Net increases in the volume or changes in timing on a monthly basis of direct surface water and indirect groundwater withdrawals from the RAA are prohibited over that resulting from base condition uses permitted as of April 1, 2006. Additional regulatory measures include permit duration criteria (Subsection 1.5.2.B.2 of the *Applicant's Handbook for Water Use Permit Applications within the South Florida Water Management District* [Applicant's Handbook; SFWMD 2015]) for those applications that identify the C&SF Project canals and dependent groundwater sources as sources of limited availability.

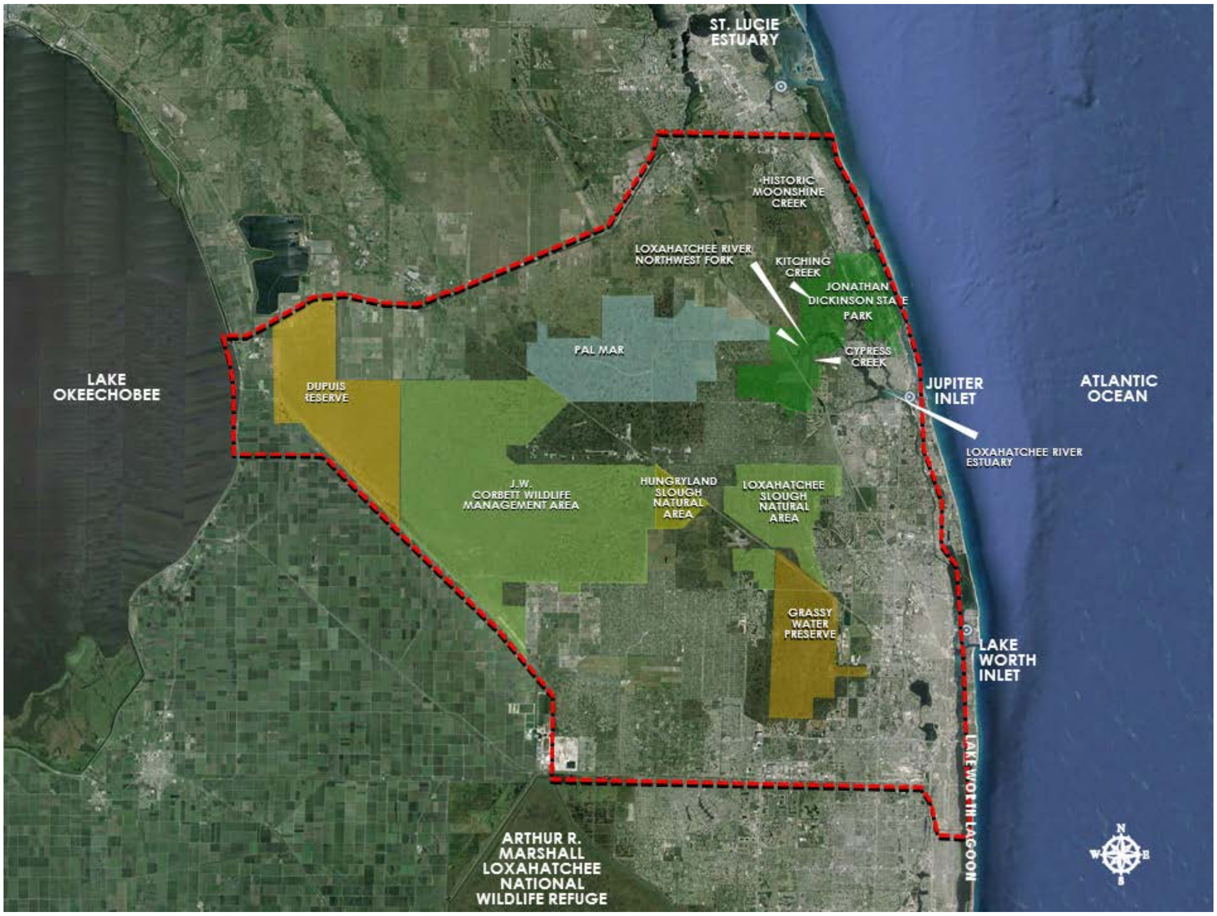

Figure C-5. Study area of the Comprehensive Everglades Restoration Plan (CERP) Loxahatchee River Watershed Restoration Project (From: United States Army Corps of Engineers 2018d).

Florida Bay

MFL Criteria

The Northeast Subregion of Florida Bay ("Florida Bay") [Subsection 40E-021(8), F.A.C.] is at the southern terminus of the state of Florida. It is the southernmost water body in Florida, receiving flow from the Everglades and surface waters farther north (**Figure C-2**). Wetland and estuarine habitats of Florida Bay support several important species and floral and faunal assemblages. The biota may be permanent residents, forage within the system, or use habitats within the bay during critical parts of their life cycle (Lorenz 1999; Ley and McIvor 2002). Prominent fauna include protected mammals such as the West Indian manatee and bottlenose dolphin, the endangered American crocodile (Mazotti and Brandt 1994), the American alligator, four species of sea turtles, and numerous bird, fish, and invertebrate species. The marsh, mangrove, and seagrass communities in and around Florida Bay create a unique habitat complex, and many aquatic and avian species migrate between the communities on a daily basis for feeding and shelter (Odum et al. 1982; Zieman 1982). Florida Bay is a thriving nursery for numerous fisheries, including the spiny lobster (Davis and Dodrill 1989; Butler et al. 1995) and commercial shrimp fisheries in the Gulf of Mexico (Odum and Heald 1975; Ehrhardt and Legault 1999; Thayer et al. 1999).

In the transition zone bordering Florida Bay, seagrasses and macroalgae provide critical habitat for fauna. Historically, northeastern Florida Bay had a high abundance of widgeon grass (*Ruppia maritima*; salt-tolerant freshwater plant*)*, *Chara hornemannii* (freshwater macroalga), *Utricularia* sp. (brackish water plant), and other desirable low-salinity species in creeks and ponds. These vegetation beds provide shelter and structure, nursery areas, and high-quality food sources for mammals as well as fish, avian, and invertebrate species.

Coastal Seagrass Bed

An MFL was adopted for Florida Bay in 2006 [Subsection 40E-8.221(5), F.A.C.] to protect this unique water body and the salinity regimes needed for its flora and fauna. The Florida Bay MFL applies to the bays, basins, and sounds within Taylor Slough and the C-111 Canal basin watersheds, including Long Sound, Little Blackwater Sound, Blackwater Sound, Buttonwood Sound, Joe Bay, Little Madeira Bay, Madeira Bay, Terrapin Bay, Eagle Key Basin, and other open waters of Florida Bay northeast of a boundary line between Terrapin Bay and Plantation Key [Subsection 40E-8.021(8), F.A.C.] (**Figure C-6**). The resulting footprint encompasses the area most directly affected by freshwater inflow, or lack thereof, from upstream regional canals. The boundary encompasses the southern Everglades freshwater marsh, the mangrove transition zone between the marsh and Florida Bay, and the northern and central sections of open water Florida Bay influenced by Taylor Slough and the C-111 Canal basin.

Florida Bay

A technical evaluation (Hunt et al. 2006) and modeling effort were conducted as part of the MFL establishment process. Based on the evaluation results, scientific peer review, and stakeholder input, the MFL regulatory criteria were developed and established. The MFL is a flow criterion with a salinity performance indicator. It includes a net minimum flow into Florida Bay over a 365-day period of 105,000 acre-feet, which was found through analysis to be needed to maintain a salinity of no greater than 30 at the Taylor River salinity monitoring station (**Figure C-6**).

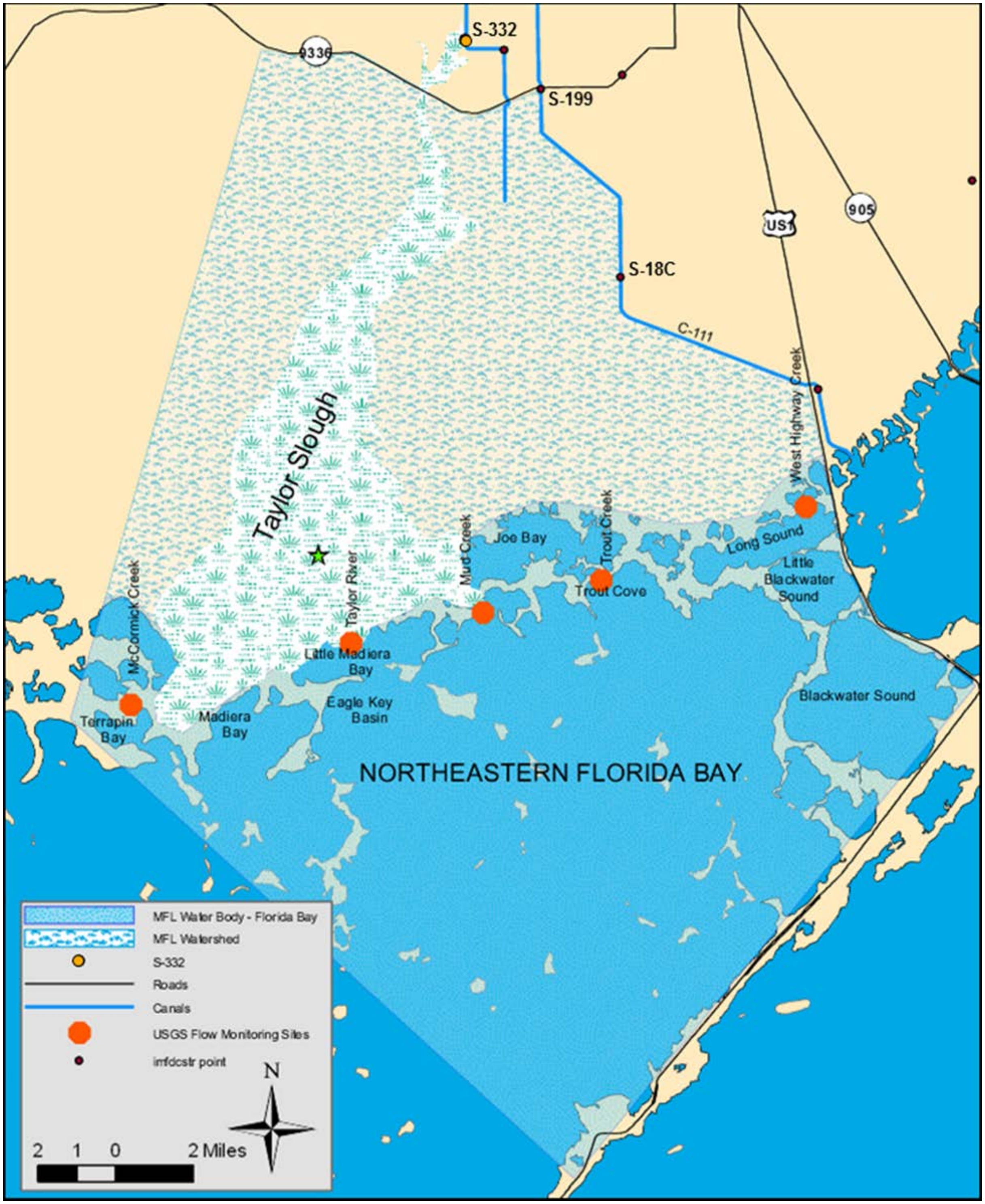

Figure C-6. Florida Bay Minimum Flow and Minimum Water Level water body and watershed. (Note: Green star marks the location of the Taylor River salinity monitoring station.)

An MFL exceedance occurs when the average salinity over 30 or more consecutive days exceeds 30 at the Taylor River salinity monitoring station. Multiple events of 30-day or more periods with salinity greater than 30, occurring within a single calendar year, are considered a single exceedance. An MFL violation occurs when an exceedance occurs during each of 2 consecutive years, more often than once in a 10-year period. By this definition, 3 consecutive years of exceedances constitute a violation.

Submerged aquatic vegetation is a critical component of the Florida Bay ecosystem. The MFL criterion is based on the flow needs and salinity tolerances of submerged aquatic vegetation in the Taylor River/Little Madeira Bay/Eagle Key gradient. Freshwater discharges from the regional water management system directly affect salinity conditions in the Everglades-Florida Bay Transition Zone and influence adjacent waters in northeastern Florida Bay. The proper salinity regime is important to the function of the estuarine ecosystem. Freshwater inflow is a potentially controllable parameter that could maintain the salinity regime, both spatially and temporally.

Since MFL adoption in 2006, several years of additional research, modeling, and monitoring have been completed for Florida Bay, and the MFL was re-evaluated in 2014 based on this additional information (SFWMD 2014). Four objectives were identified for re-evaluation:

- Determine if the MFL criterion was violated since the rule was established in 2006. For this evaluation, MFL flow and salinity data were reviewed in conjunction with bay ecological indicators to determine if MFL violations had occurred.
- Assess the potential for the MFL criterion to be met in the future with recently completed restoration project components and operations in place (e.g., Everglades Restoration Transition Plan, Tamiami Trail One-Mile Bridge, C-111 Spreader Canal Western Project) and 2030 consumptive use demand projections represented. A regional model was used to evaluate flows to the bay with the three project components simulated under current and 2030 water use demand scenarios. Water use demand numbers were derived from the *2013 Lower East Coast Water Supply Plan Update* (SFWMD 2013).
- Determine whether the existing MFL criterion is an adequate threshold for identifying significant harm to the bay, considering updated data and research. Information produced from the prevention strategy monitoring and research programs was used to assess the overall condition and responses to flow and salinity variations in order to determine if the MFL criterion is representative of significant harm.
- Examine the relationship between the flow criterion and salinity indicator contained in the MFL rule. In the absence of an updated version of the Flux Accounting Tidal Hydrology Ocean Model (FATHOM), exploratory statistical correlations were developed between multiple flow, stage, and salinity data sets as preliminary assessments of relationships.

Results of the 2014 re-evaluation indicated the existing MFL criterion was an adequate threshold of significant harm to Florida Bay.

Prevention Strategy

At the time of MFL adoption, Florida Bay was meeting the MFL and no violations were anticipated to occur in the next 20 years. Therefore, a prevention strategy [Subsection 40E-8.421(8), F.A.C.] was adopted for it simultaneously with MFL adoption. The prevention strategy for Florida Bay includes two main components:

1) Projects for delivering more water to Florida Bay (**Chapter 6**), specifically:
   - Modified Water Deliveries to Everglades National Park Project (ModWaters), C-111 Canal Project, and any associated operational and construction plans pursuant to these projects;
   - CERP C-111 Spreader Canal Western Project; and
   - C-111 South Dade Project.

2) Continued field monitoring and research to assess salinity, water level, flow conditions, and biological resource response in the region.

Portions of the aforementioned projects have been completed and are operational, while other portions are still under construction. These and other capital projects supporting flows in northeastern Florida Bay are listed in **Table C-1**.

Biscayne Aquifer

MFL Criteria

The Biscayne aquifer extends beneath Monroe, Miami-Dade, Broward, and Palm Beach, counties, over an area of approximately 2.56 million acres (**Figure C-7**). It is a highly permeable, wedge-shaped, unconfined aquifer more than 200 feet thick in coastal Broward County, thinning to an edge 35 to 40 miles inland in the Everglades (United States Geological Survey 2018). The Biscayne aquifer is composed of limestone, sandstone, and sand. In southern and western Miami-Dade County, the aquifer is primarily limestone and sandstone. However, in northern Miami-Dade County, Broward County, and southern Palm Beach County, the aquifer is primarily sand. Generally, the sand content increases to the north and east (United States Geological Survey 2018). The Biscayne aquifer supplies all, or a large portion, of municipal water supply systems from southern Palm Beach County southward, including the system for the Florida Keys, which is primarily supplied via pipeline from mainland Miami-Dade County.

Due to its widespread use, protecting the Biscayne aquifer from saltwater intrusion is important. An MFL and a prevention strategy were adopted for the Biscayne aquifer in 2001 [Subsection 40E-8.231, F.A.C.] based on analysis of the relationships between groundwater and canal water levels, and the potential for saltwater intrusion (SFWMD 2000a). The MFL criterion is the water level in the aquifer that results in movement of the saltwater interface landward to the extent that groundwater quality at an established withdrawal point is insufficient to serve as a water supply source. An MFL violation occurs when water levels within the aquifer produce this degree of saltwater movement at any point in time. The MFL criterion does not address the groundwater base flows to Biscayne Bay.

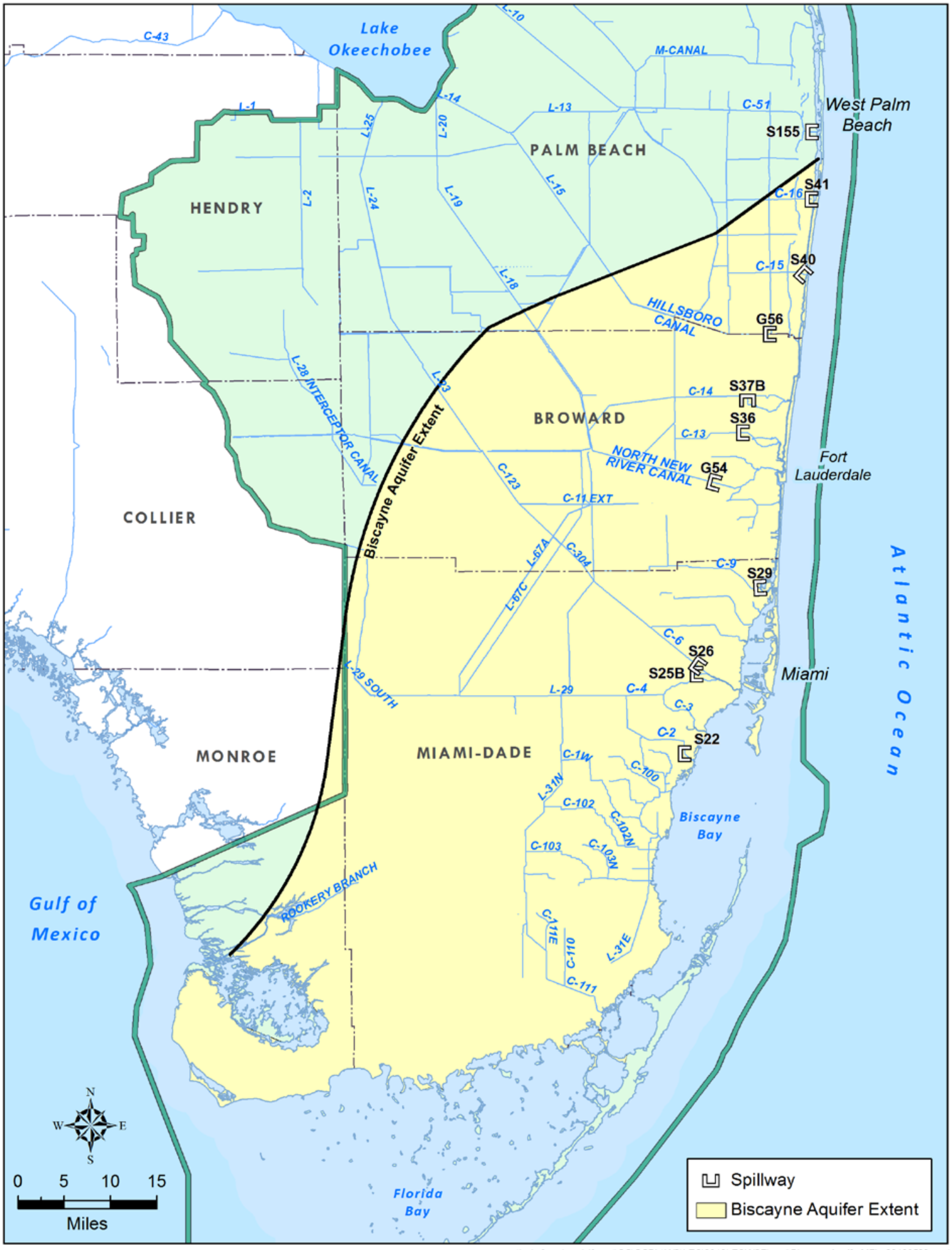

Figure C-7. Biscayne aquifer Minimum Flow and Minimum Water Level water management structures.

Prevention Strategy

Maintaining sufficient water levels (stages) in coastal canals is crucial for recharging the Biscayne aquifer and maintaining the water level in the aquifer needed to meet the MFL. An MFL prevention strategy [Subsection 40E-8.421(3), F.A.C.] was adopted for the aquifer simultaneously with the MFL adoption. The prevention strategy includes specific canal stages, which are specified in the *2000 Lower East Coast Regional Water Supply Plan* (SFWMD 2000b), for meeting the MFL criterion.

LAW/CODE

Subsection 40E-8.421, F.A.C.

(3) Biscayne Aquifer. The LEC Plan contains an approved prevention strategy for the Biscayne Aquifer pursuant to Section 373.0421, F.S., which consists of the following:

(a) Maintain coastal canal stages at the minimum operation levels shown in Table J-2 of the LEC Plan;

(b) Apply conditions for permit issuance in Chapter 40E-2, F.A.C., to prevent the harmful movement of saltwater intrusion up to a 1-in-10 year level of certainty;

(c) Maintain a ground water monitoring network and utilize data to initiate water shortage actions pursuant to Rule 40E-8.441, F.A.C. and Chapters 40E-21 and 40E-22, F.A.C.;

(d) Construct and operate water resource and water supply development projects; and

(e) Conduct research in high risk areas to identify where the portions of the saltwater front is adjacent to existing and future potable water sources.

Table C-4 provides the minimum water levels at 11 primary water management structures maintained by the SFWMD in canals that overly the Biscayne aquifer (**Figure C-7**). To meet the MFL, canal stages cannot fall below the levels shown in Table J-2 of the *2000 Lower East Coast Regional Water Supply Plan* for more than 180 days, and the average annual stage must be sufficient to allow water levels and chloride concentrations in the aquifer to recover to levels that existed before a drought or discharge event occurred (SFWMD 2000b).

The SFWMD is conducting projects and studies as well as providing incentives to local water users to develop alternative water supplies, including the use of reclaimed water, to maintain optimum water levels in coastal canals, provide aquifer recharge, combat saltwater intrusion, and thereby reduce the potential for MFL violations in the Biscayne aquifer. More information on these additional measures is provided in **Table C-1**.

Further information about the MFLs and recovery and prevention strategies adopted for water bodies in the LEC Planning Area can be found in Chapter 40E-8, F.A.C., and on the SFWMD website (www.sfwmd.gov; Search: Minimum Flows and Levels). More information on the RAAs mentioned in this appendix is provided in **Chapter 4** of this plan update and in Subsection 3.2.1 of the Applicant's Handbook (SFWMD 2015).

Table C-4. Minimum canal operation levels of coastal canals (From: SFWMD 2000b, Volume II, Appendix J).

Canal/Structure	Minimum Canal Operation Levels to Protect Against MFL Violations (feet NGVD29)
C-51/S-155	7.80
C-16/S-41	7.80
C-15/S-40	7.80
Hillsboro/G-56	6.75
C-14/S-37B	6.50
C-13/S-36	4.00
North New River/G-54	3.50
C-9/S-29	2.00
C-6/S-26	2.50
C-4/S-25B	2.50
C-2/S-22	2.50

MFL = Minimum Flow and Minimum Water Level; NGVD29 = National Geodetic Vertical Datum of 1929; SFWMD = South Florida Water Management District.

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D

Groundwater Monitoring and Analysis

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In the Lower East Coast (LEC) Planning Area of the South Florida Water Management District (SFWMD or District), water supply monitoring programs are used to guide operations, provide early warning of threats to water supply, protect existing users and natural systems, and provide data for regional surface water and groundwater models Monitoring programs associated with environmental restoration are identified in **Chapter 6** and monitoring results can be found in the annual *South Florida Environmental Report* (SFER). Real-time and long-term climate monitoring information obtained by the SFWMD is available on the SFWMD website (www.sfwmd.gov; Search: DBHYDRO). Historical and current hydrologic, meteorologic, hydrogeologic, and water quality data for the 16 counties within the District's boundaries are available from the SFWMD's corporate environmental database, DBHYDRO.

Several sources of groundwater data were reviewed during development of this *2018 Lower East Coast Water Supply Plan Update* (2018 LEC Plan Update), including:

- Hydrologic data from monitoring wells in the surficial and Floridan aquifer systems (SAS and FAS);
- Saltwater interface monitoring data and maps;
- County-level saltwater intrusion modeling; and
- The results of the East Coast Floridan Model (ECFM) used in support of this plan update.

This appendix provides information on the following:

- Long-term trends in water levels and quality at specific locations in the SAS (including Biscayne and Lower Tamiami aquifers);
- Location of the saltwater interface in the SAS and the coastal utilities vulnerable to saltwater intrusion during dry periods;
- Historical water quality trends for FAS utilities and the regional FAS monitoring network;
- Recent Broward and Miami-Dade SAS models, analyzing potential impacts of sea level rise impacts; and
- ECFM simulation results.

WATER LEVELS

Surface water and groundwater levels are collected for multiple reasons and with multiple sampling methods, including the following:

- Freshwater head is measured at coastal canal structures and in aquifer locations near the coast to evaluate the potential for saltwater intrusion and management during water shortage conditions.

- Surface water staff gauges and shallow groundwater piezometers are used to determine and monitor hydroperiods in natural and man-made water bodies containing wetlands.

- The depth to water below ground or piezometric head above land surface is collected to determine water availability, guide pump selection, monitor compliance with Maximum Developable Limit (MDL) regulations, determine drawdown in pumping wells, and ascertain the area of influence of pumping wells.

- Surface water levels in lakes, reservoirs, natural storage areas, and canals are monitored to guide operations for providing water supply and determining water shortage management.
- Water level monitoring provides data for surface water and groundwater model calibration and verification.
- Groundwater and surface water level data are used to establish Minimum Flow and Minimum Water Level (MFL) criteria and to monitor compliance with those criteria to protect natural systems.

WATER QUALITY

Water quality data are collected to determine a water source's suitability to meet an intended use and the water treatment methods that will be needed. These data include naturally occurring constituents (e.g., chloride and total dissolved solids [TDS] concentrations) and to contamination constituents (e.g., from petroleum or industrial sources). Information on contamination monitoring programs can be obtained from the Florida Department of Environmental Protection. This appendix focuses on chloride and TDS concentration data, which are collected for the following purposes:

- To determine the appropriate treatment method(s) to meet drinking water standards.
- To determine the inland extent of the saltwater interface or the location of high-salinity plumes.
- To determine the suitability of the water for irrigation, considering turf or crop salinity tolerances, and to estimate freshwater volumes needed to blend with saline sources prior to use.
- To ensure compliance with regulatory limits on salinity prior to use or discharge to fresh water or bodies.
- To develop and calibrate density-dependent regional and local groundwater models.

SURFICIAL AQUIFER SYSTEM

In the coastal portions of the LEC Planning Area, a primary water supply concern for SAS users is saltwater intrusion, both laterally from the ocean and vertically from underlying relict seawater. Water levels and chloride concentrations are used to evaluate the rate and level of impact of saltwater intrusion. In the portions of Hendry and Collier counties within the LEC Planning Area, saltwater intrusion is not an issue; however, water levels are the principal concern regarding water supply availability in these areas.

Monitoring data for the SAS are collected by state and federal agencies as well as private entities, primarily permittees (**Figure D-1**). Data collected by the SFWMD and Everglades National Park are available from DBHYDRO; data collected by water use permittees are available from the SFWMD ePermitting portal; and data collected by the United States Geological Survey (USGS) are available from the National Water Information System Mapper online tool. In addition to chloride data from grab sampling, time-series electromagnetic induction log data are collected by the USGS from monitor wells to evaluate changes in water conductivity throughout an aquifer over time and are used to monitor saltwater intrusion (Valderrama 2017). A sudden increase in conductivity (typically greater than 67 microsiemens per meter) represents a change from fresh water to salt water.

For water supply planning purposes, 12 monitor wells in the LEC Planning Area were chosen as representative of long-term trends in regional water levels (**Table D-1**; **Figure D-1**). The wells show an annual 2- to 3-foot variation in water levels between the wet and dry seasons, which is typical in rainfall-driven aquifers. Although the water level data collected from the wells show seasonal variations as expected, historical data indicate relatively stable trends in the region.

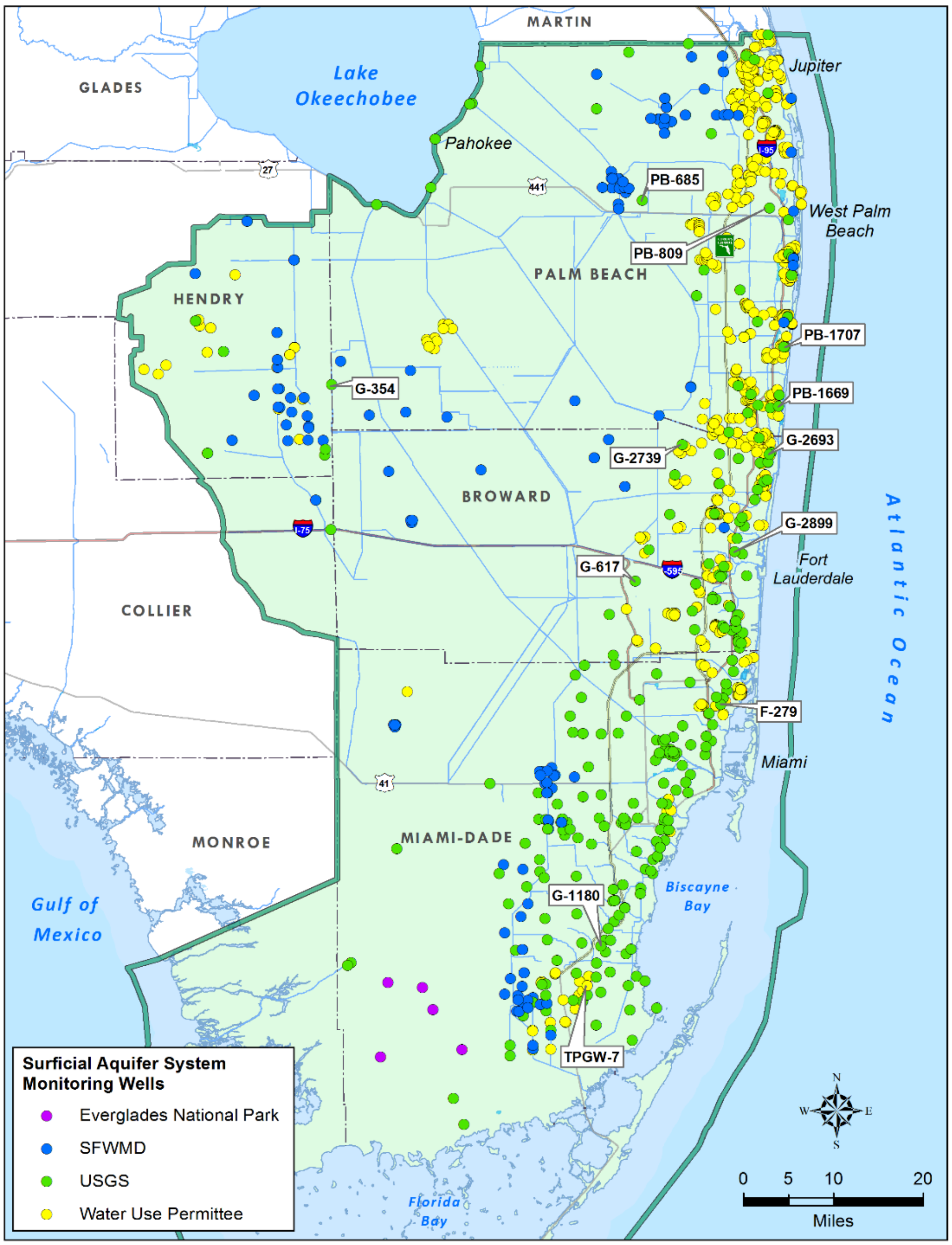

Figure D-1. Surficial aquifer system monitor well locations and monitoring entity, in the LEC Planning Area.

Table D-1. Minimum, maximum, and average groundwater levels for select surficial aquifer system wells in the LEC Planning Area.

County	Well Name	Total Depth (feet below land surface)	Minimum Level	Maximum Level	Average Level
Palm Beach	PB-685	17	11.47	16.96	14.00
	PB-809	150	8.37	12.02	10.18
	PB-1669	131	2.84	7.59	4.90
	PB-1707	183	0.98	5.20	3.04
Broward	G-617	29	2.79	6.10	3.85
	G-2693	229	1.94	6.45	4.51
	G-2739	21	5.34	12.00	7.86
	G-2899	165	0.65	3.17	1.82
Miami-Dade	F-279	117	0.99	2.77	1.66
	G-354	90	0.68	3.03	1.84
	G-1180	67	0.75	3.31	2.01
	TPGW-7	114	-4.14	2.05	0.42

Note: All levels are presented in feet National Geodetic Vertical Datum of 1929.

Figures D-2 to **D-4** present hydrographs for three shallow wells in inland Palm Beach and Broward counties, illustrating seasonal fluctuations and long-term stability in water levels. These monitor wells are near canal systems that influence water levels, but only G-617 is directly adjacent to a canal.

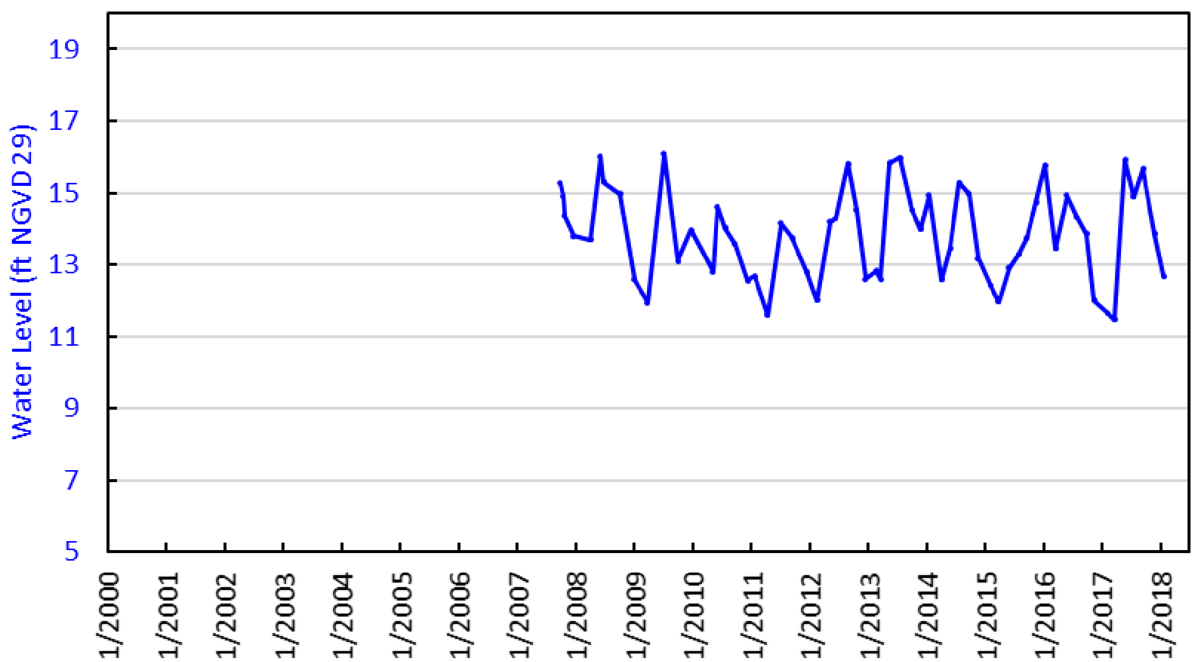

Figure D-2. Water levels in the surficial aquifer system at well PB-685 (17 feet deep) in Loxahatchee, central Palm Beach County.

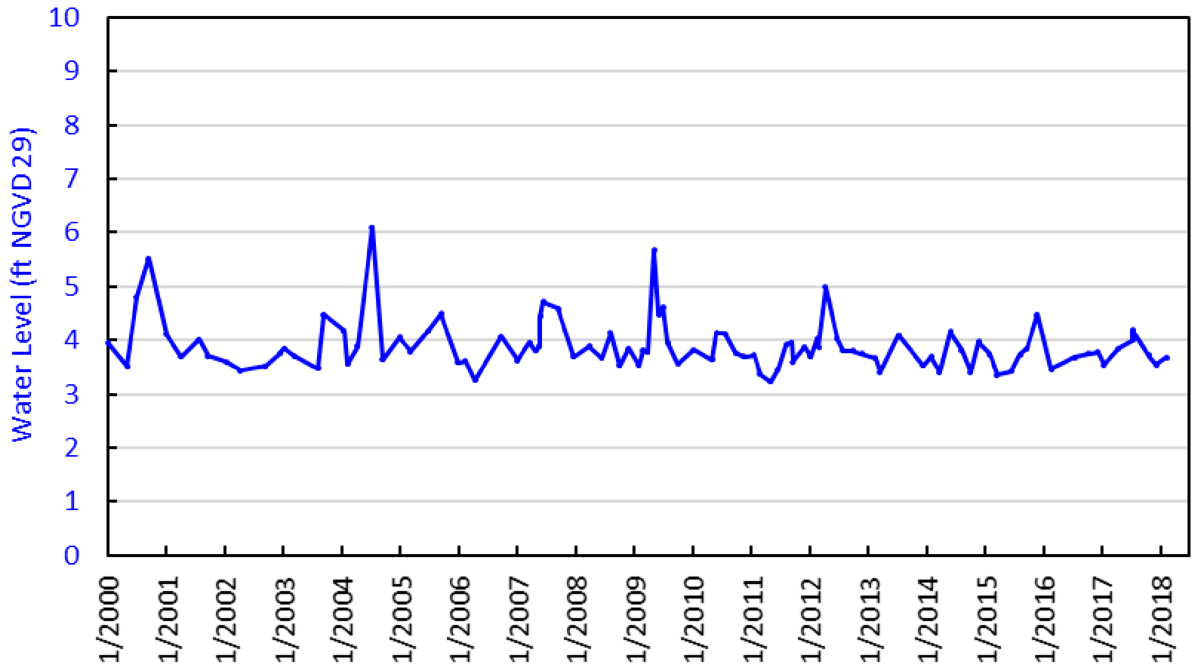

Figure D-3. Water levels in the surficial aquifer system at well G-617 (29 feet deep) in Davie, central Broward County.

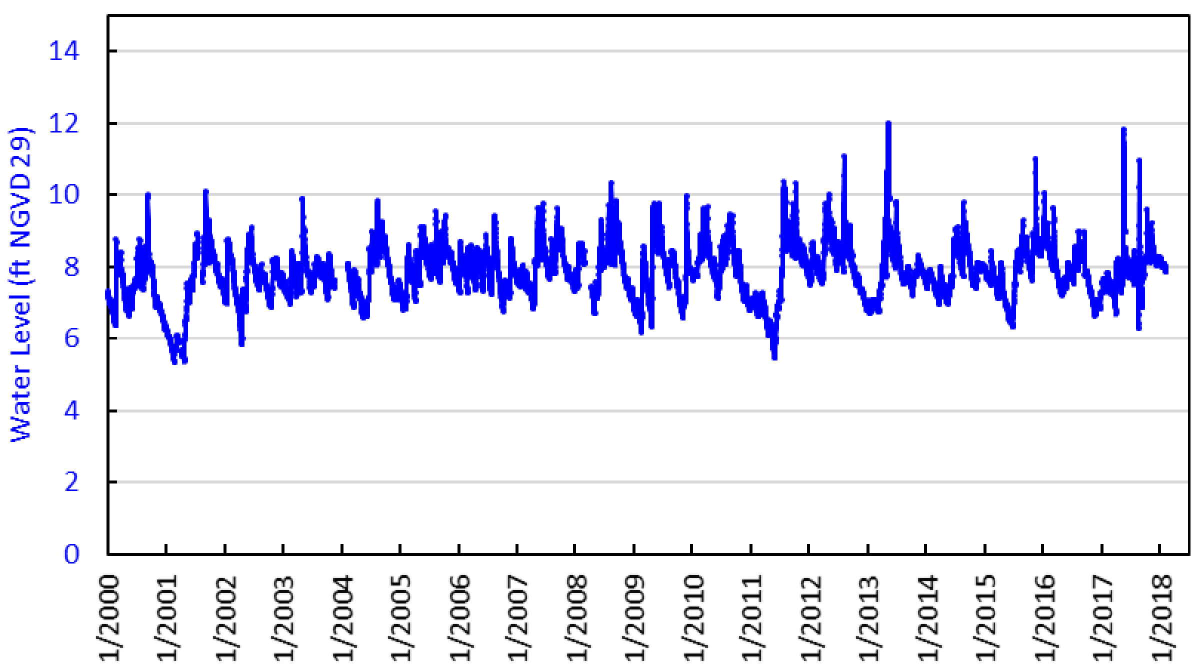

Figure D-4. Water levels in the surficial aquifer system at well G-2739 (21 feet deep) in Parkland, northeastern Broward County.

Lower Tamiami MDL

In 2003, the SFWMD adopted MDL criteria for the Lower Tamiami aquifer, which underlies the portion of eastern Hendry County within the LEC Planning Area. The criteria limit withdrawals from the Lower Tamiami aquifer such that the potentiometric head of the aquifer may not drop to less than 20 feet above the top of the uppermost geologic strata of the aquifer at any point during 1-in-10 year drought conditions. Regional Lower Tamiami aquifer monitor wells are used to track water levels and ensure compliance with the criteria (**Figure D-5**).

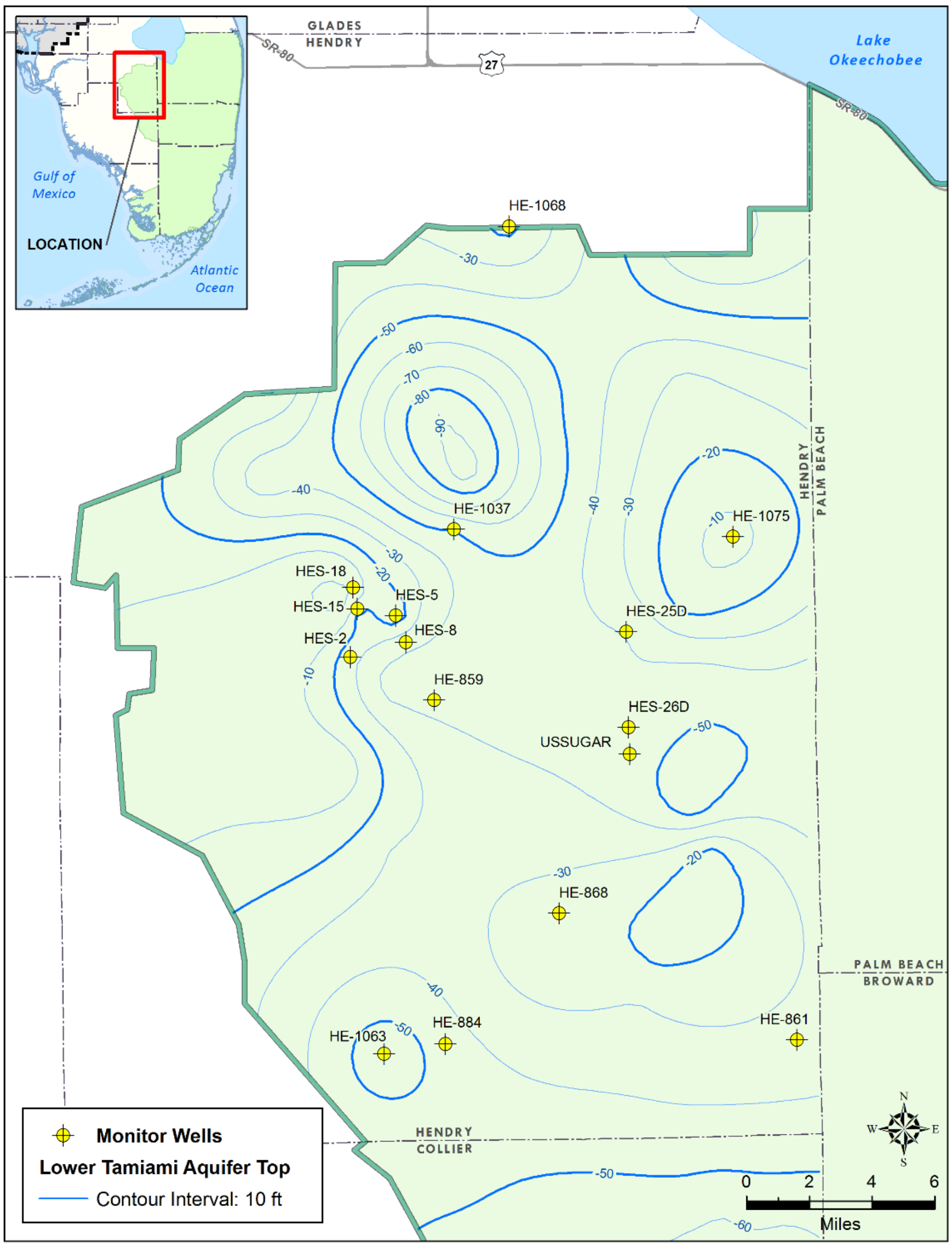

Figure D-5. Lower Tamiami aquifer monitor wells in eastern Hendry County.

Figures D-6 to **D-11** present hydrographs showing the MDL in relation to historical water levels in select monitor wells. The MDL was determined from elevation data for the top of the Lower Tamiami aquifer as described in the hydrogeologic unit mapping update for the Lower West Coast aquifers (Geddes et al. 2015). Water levels in monitor wells USSUGAR and HES-26D periodically have approached or exceeded the MDL over the period of record due to withdrawals by agricultural irrigation users during drought conditions. Other Lower Tamiami aquifer monitor wells (e.g., HES-25D, HE-859, HE-861, HE-1068) have remained at least 10 feet above the MDL for the period of record. As agricultural water use in the eastern Hendry County is expected to increase over the planning horizon (2016 to 2040), water levels will require close monitoring where the MDL has been reached or exceeded during 1-in-10 year drought conditions. Alternative water supply (AWS) options may need to be developed in some areas to ensure adequate future supply and prevent harm to the aquifer (**Chapter 7**).

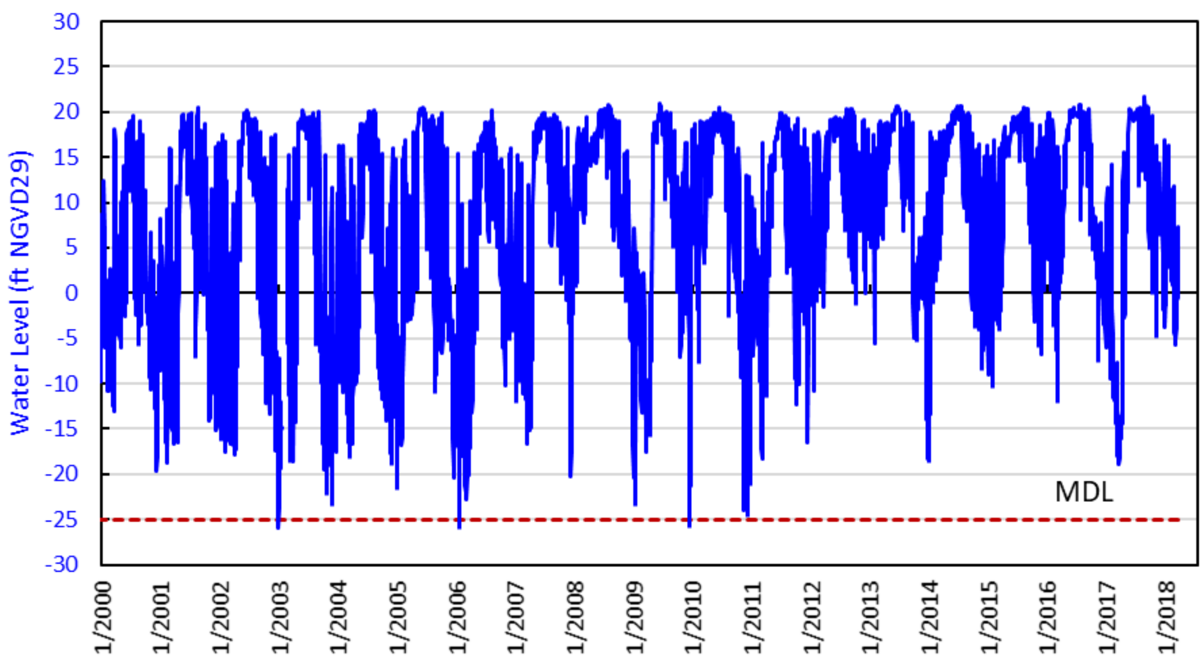

Figure D-6. Water levels in the Lower Tamiami aquifer at well USSUGAR (100 feet deep) in eastern Hendry County.

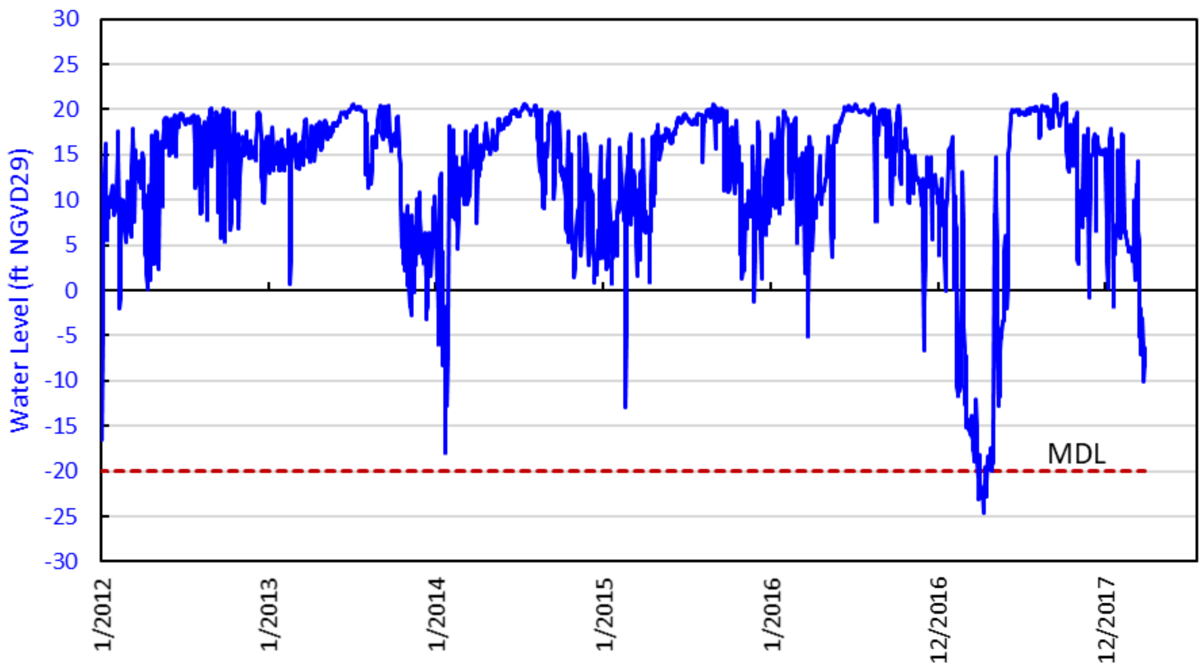

Figure D-7. Water levels in the Lower Tamiami aquifer at well HES-26D (100 feet deep) in eastern Hendry County.

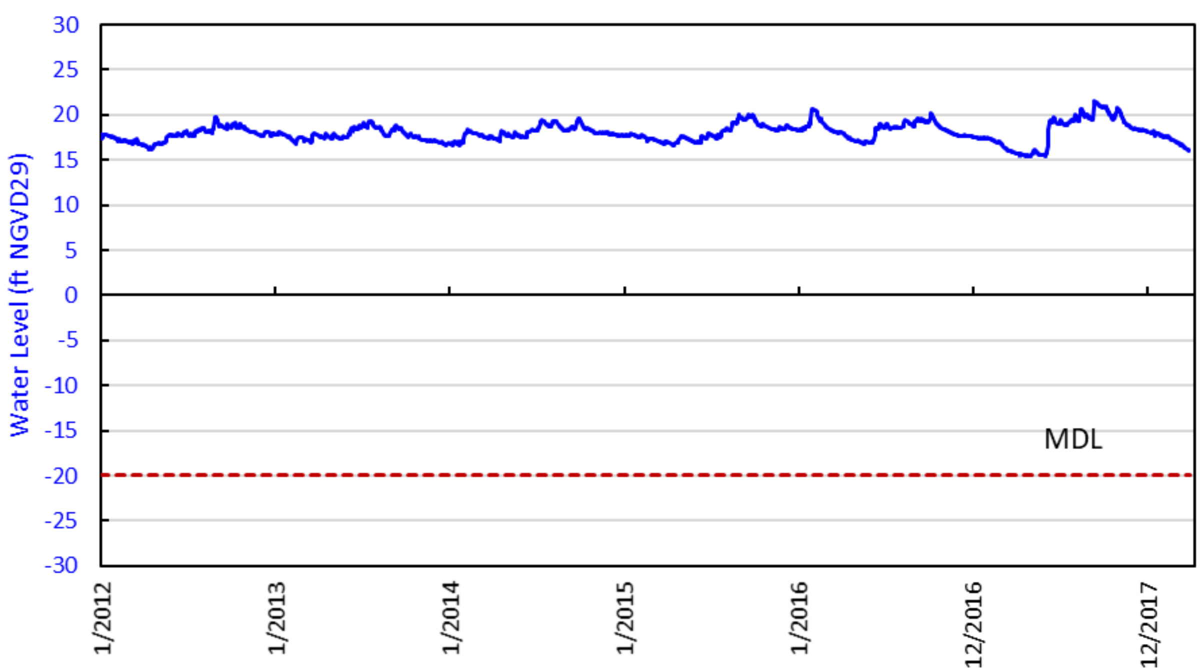

Figure D-8. Water levels in the Lower Tamiami aquifer at well HES-25D (92 feet deep) in eastern Hendry County.

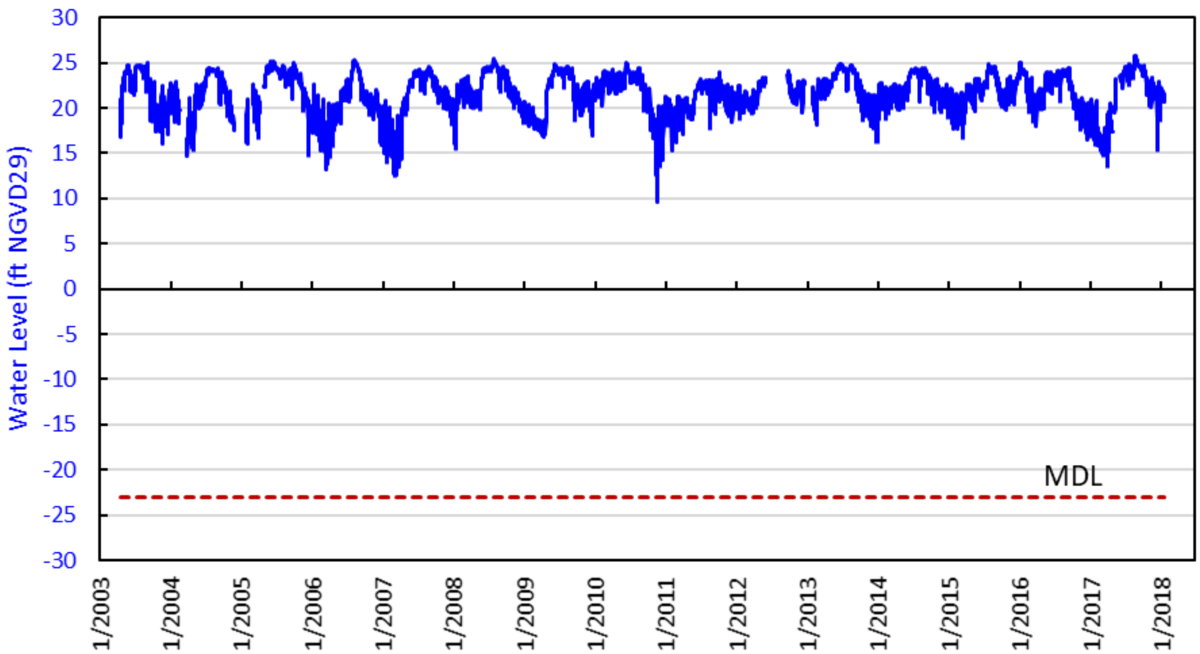

Figure D-9. Water levels in the Lower Tamiami aquifer at well HE-859 (59 feet deep) in eastern Hendry County.

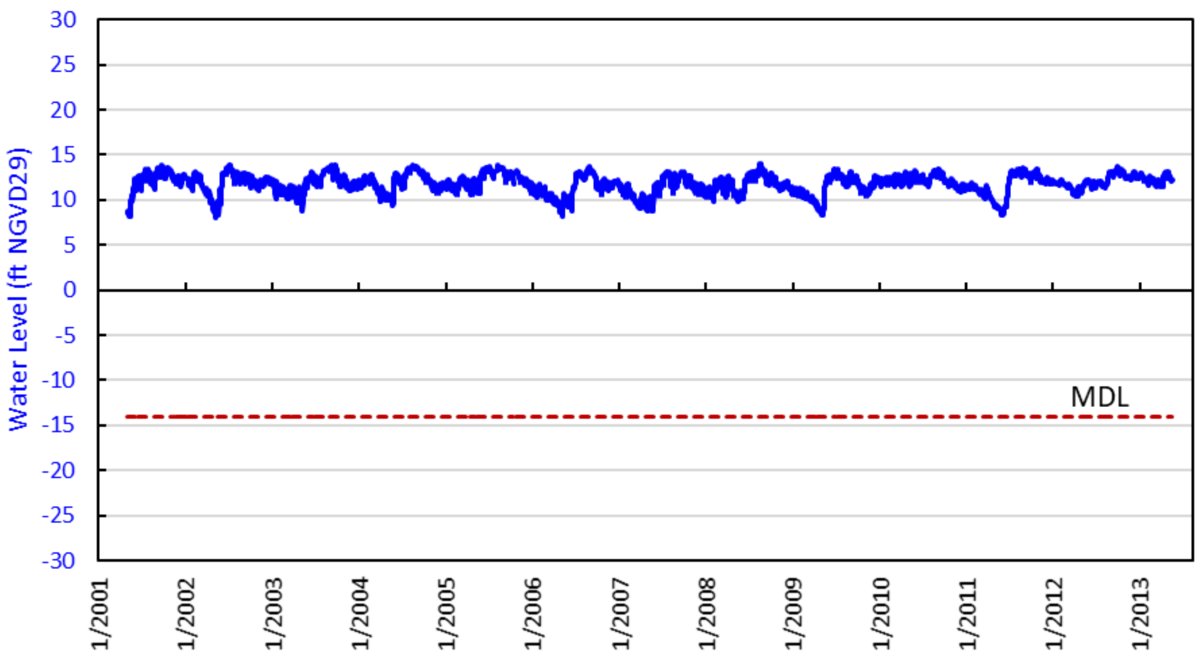

Figure D-10. Water levels in the Lower Tamiami aquifer at well HE-861 (70 feet deep) in southeastern Hendry County.

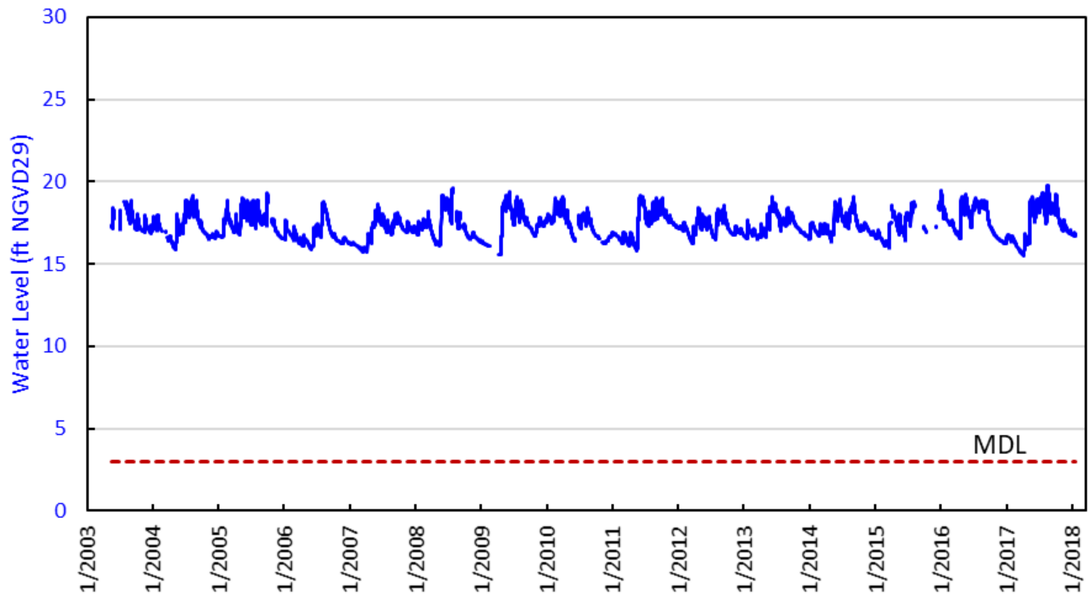

Figure D-11. Water levels in the Lower Tamiami aquifer at well HE-1068 (160 feet deep) in northeastern Hendry County.

Saltwater Intrusion

Saltwater intrusion is the inland lateral movement of seawater or the upward movement of brackish groundwater (upconing) from deeper portions of the aquifers. Brackish water is defined in SFWMD permitting criteria as having a chloride concentration of 250 milligrams per liter (mg/L) or greater, which is a secondary drinking water standard.

> **WATER OPTIONS**
>
> Brackish water has a chloride concentration greater than 250 mg/L and less than 19,000 mg/L (seawater). The terms fresh, brackish, salt, and brine are used to describe the quality of water. Brackish supplies in the low range of these salinities may be used for some agricultural purposes. Advanced treatment technologies, such as reverse osmosis, electrodialysis, or electrodialysis reversal, must be employed before this type of water is suitable for human consumption.

The inland movement of seawater primarily affects coastal communities while the upward movement of brackish groundwater is a concern for some inland areas (e.g., western Palm Beach and Broward counties). The east coast of Florida is particularly susceptible to lateral saltwater intrusion due to the following factors:

- Proximity to the Atlantic Ocean, inlets, and lagoons;
- A large number of coastal wellfields;
- Low land surface elevations (less than 10 feet above mean sea level);
- Drainage canals that lower the fresh water table, which reduces the water pressure exerted against the saltwater interface;
- Canals without coastal water control structures to inhibit inland movement of seawater; and
- Rising sea levels.

Groundwater with chloride concentrations greater than 250 mg/L is found in portions of central and western Palm Beach and Broward counties and is attributed to relict seawater (connate water) in less transmissive portions of the SAS (Miller 1988; Reese and Wacker 2009). This underlying brackish water limits the depths and withdrawal rates for some Public Water Supply (PWS) and landscape irrigation wells. Chloride concentrations in shallow groundwater wells less than 20 feet deep in the Everglades Agricultural Area range from 100 to 300 mg/L. Chloride concentrations increase with depth and can exceed 1,000 mg/L below 50 feet and 9,000 mg/L at depths to 200 feet. Therefore, wells typically are not used for irrigation in the Everglades Agricultural Area.

Higher salinities also are found in agricultural and flood control canals in western Palm Beach County where some canals intersect brackish portions of the SAS. Chloride concentrations in SFWMD canals in the Everglades Agricultural Area generally fluctuate between 50 and 200 mg/L over the year. Data collected from 2000 to 2009 at culverts 12 and 12A near Pahokee on Lake Okeechobee have recorded chloride concentration fluctuations up to 600 mg/L.

The SFWMD and USGS periodically develop maps documenting the position of the coastal saltwater interface using salinity data from regional monitor wells. The saltwater interface is defined as the farthest inland extend of water with a chloride concentration of 250 mg/L for SFWMD maps and 1,000 mg/L for USGS maps. The SFWMD developed saltwater intrusion maps for Palm Beach and Broward counties using 2009 and 2014 data and plans to update the maps every 5 years. The USGS produces saltwater intrusion maps for Miami-Dade County, the most recent of which was based on 2011 data (Prinos et al. 2014). An update of the saltwater interface in southern Miami-Dade County was published in 2017 (Prinos 2017). New maps using 2018 data for Miami-Dade County are being developed. By updating the maps over time, the SFWMD and USGS can track movement of the saltwater interface, identify areas of concern, and better understand the potential effects of saltwater intrusion on coastal wellfields and aquifers. Areas of concern may require additional monitoring or changes in wellfield operations.

In general, the 2009 and 2014 saltwater intrusion maps show similar saltwater interface locations; however, differences indicate the interface is regionally dynamic, with inland movement in some areas and seaward movement in other areas. Local investigation of the saltwater interface position may be needed in areas with inadequate monitoring between wellfields and the saltwater interface.

The USGS (2017) maintains a saltwater intrusion mapping website that graphically depicts statistical analyses of water level and salinity data collected from USGS monitoring sites in South Florida. This mapping tool also shows the SFWMD salinity control structures, the 2014 saltwater interface location in Palm Beach and Broward counties, and the 2011 saltwater interface location in Miami-Dade County.

Groundwater in some areas of coastal Palm Beach, Broward, and Miami-Dade counties has chloride concentrations greater than 250 mg/L. In Palm Beach County, chloride concentrations along the coast have remained relatively stable overall and have declined in the Lake Worth and Delray Beach areas. Minor inland movement of the saltwater interface has occurred in northern and central Broward County, while steady inland movement has been observed around Deerfield Beach and along the C-11 Canal and North New River. The North Miami and Homestead areas show the most inland movement of the saltwater interface in Miami-Dade County. A unique condition in southern Miami-Dade County is a hypersaline plume from Florida Power & Light (FPL) Turkey Point Plant cooling canals that is migrating westward along the bottom of the more permeable zone of the Biscayne aquifer, discussed later in this section.

Palm Beach County

The 2009 and 2014 saltwater interface positions in Palm Beach County are shown in **Figure D-12**. Chloride concentrations at the monitor well locations were measured in 2014. For reference, the figure also includes PWS wellfield protection areas, which identify the cone of influence of the withdrawals. Several utilities with wellfields near the coast (e.g., Tequesta, Lake Worth, Lantana, Delray Beach) have made operational changes in response to saltwater intrusion that have effectively moved the saltwater interface seaward (**Figure D-12**, Inset A).

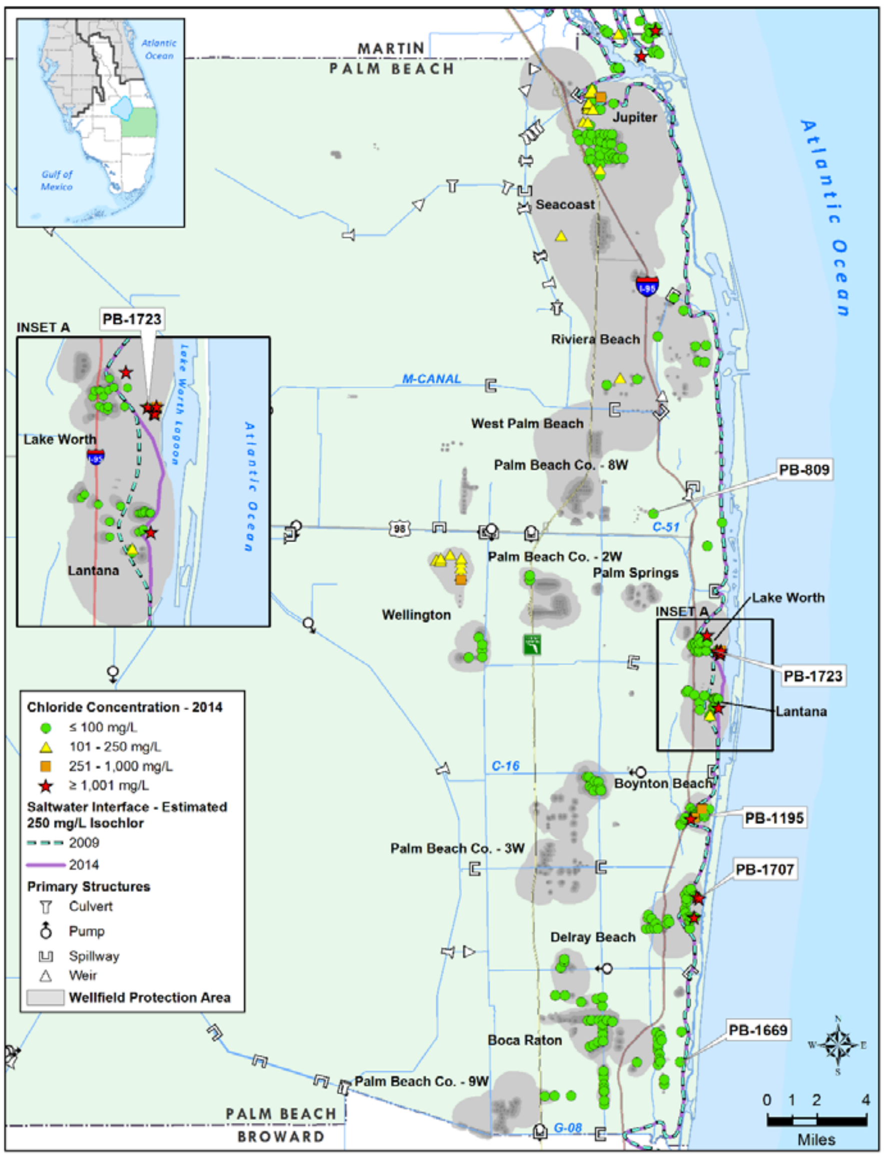

Figure D-12. Surficial aquifer system chloride monitoring locations, chloride concentrations, and 2009 and 2014 saltwater interface positions in Palm Beach County.

Chloride concentrations in USGS well PB-809, located slightly inland, have increased from 40 to 65 mg/L over the past three decades (**Figure D-13**). Data indicate the water levels and chloride concentrations are relatively stable at this location.

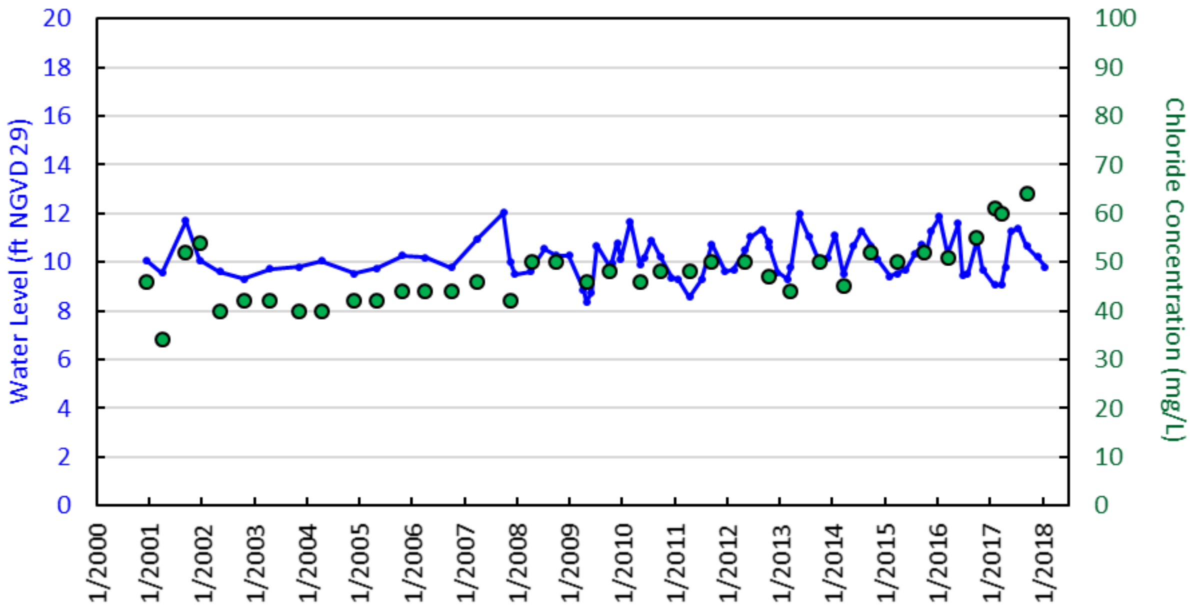

Figure D-13. Water levels and chloride concentrations in monitor well PB-809 (150 feet deep) in West Palm Beach, east-central Palm Beach County.

The induction logs for PB-1723 (**Figure D-14**), located at the City of Lake Worth PWS wellfield, show the saltwater interface between 150 and 270 feet below land surface (bls) has retreated since 2007 due to changes in SAS wellfield operations, abandonment of eastern wells, and operation of an FAS wellfield. However, in 2016, the saltwater interface moved inland between 250 and 270 feet bls. Continual inland movement of salt water is seen at the base of the SAS. The City of Lake Worth PWS wells in the SAS range from 50 to 300 feet deep.

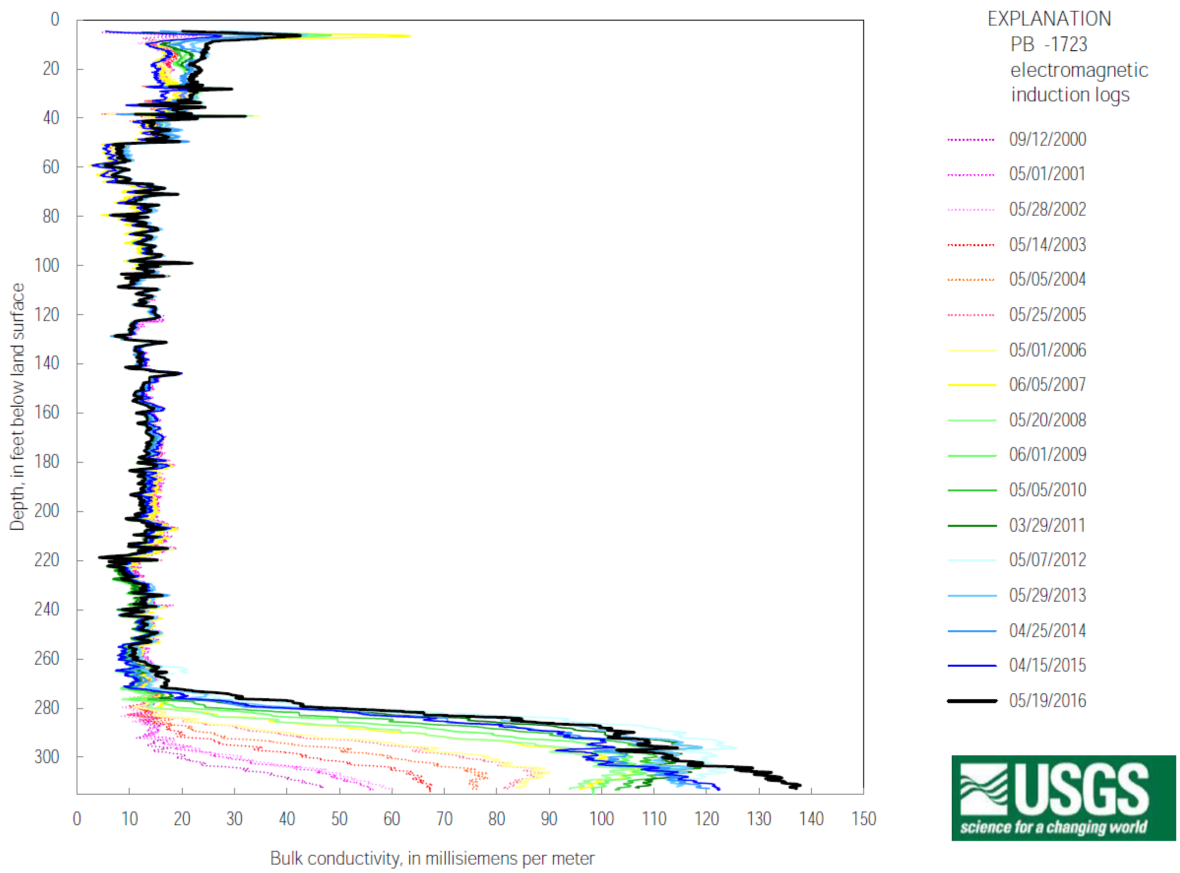

Figure D-14. Induction logs for monitor well PB-1723 (318 feet deep) in Lake Worth, eastern Palm Beach County (From: Valderrama 2017).

The induction logs for monitor well PB-1195 (**Figure D-15**), located between U.S. Highway 1 and Interstate 95 in Boynton Beach, shows a decrease in salinity, especially between 110 and 150 feet bls, from 2000 to 2011, with slight increases from 2012 to 2016. Changes in eastern Boynton Beach PWS wellfield operations, addition of an aquifer storage and recovery (ASR) well, and use of reclaimed water reduced demand on the eastern wellfield and improved salinities in groundwater shallower than approximately 200 feet bls. However, below 200 feet bls, the steadily increasing conductivity indicates inland movement of the saltwater interface.

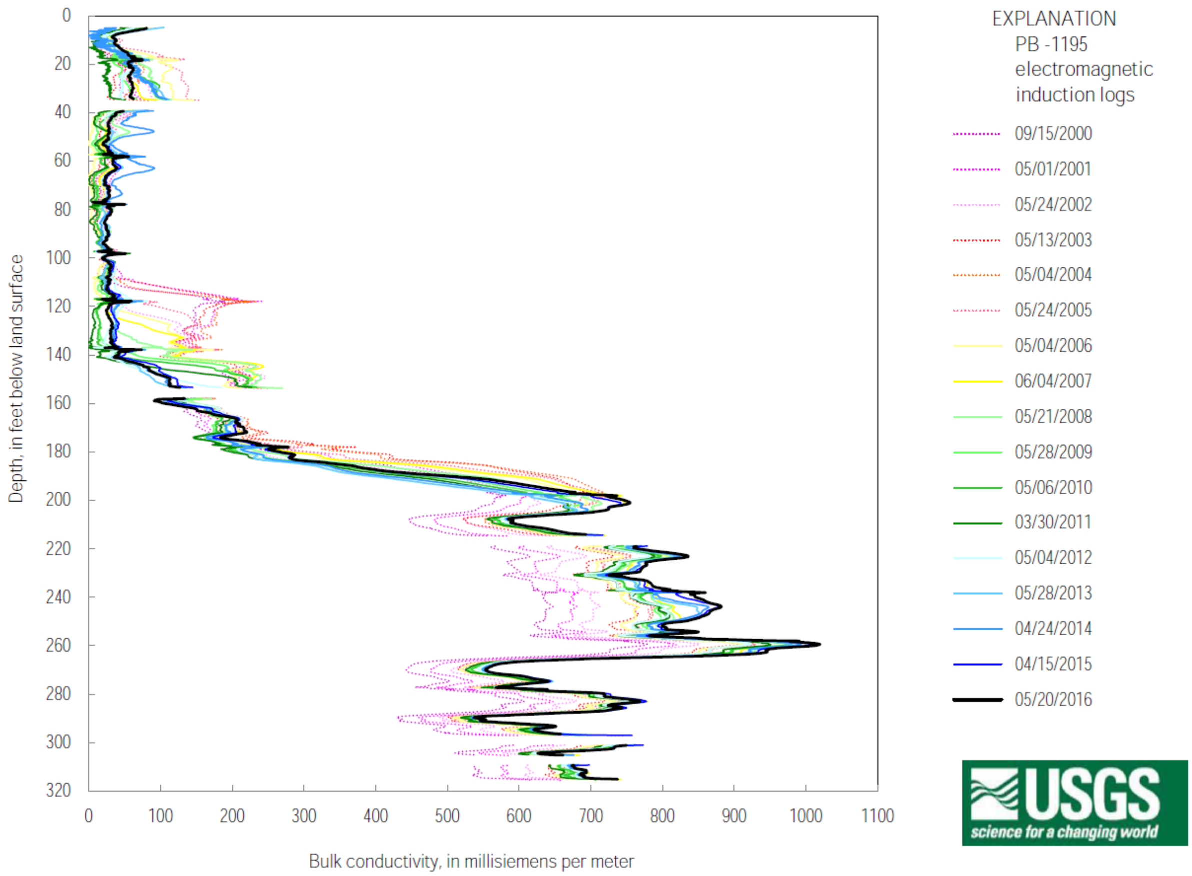

Figure D-15. Induction logs for monitor well PB-1195 (325 feet deep) in Boynton Beach, southeastern Palm Beach County (From: Valderrama 2017).

Chloride concentrations in monitor well PB-1707, located east of the Delray Beach East wellfield, has decreased from approximately 4,000 mg/L in 2014 to 3,000 mg/L in 2018 (**Figure D-16**). To prevent the saltwater interface from moving farther inland, the utility shifted wellfield pumpage westward, which likely resulted in the reduction (downward trend) of chloride concentrations and increased water levels.

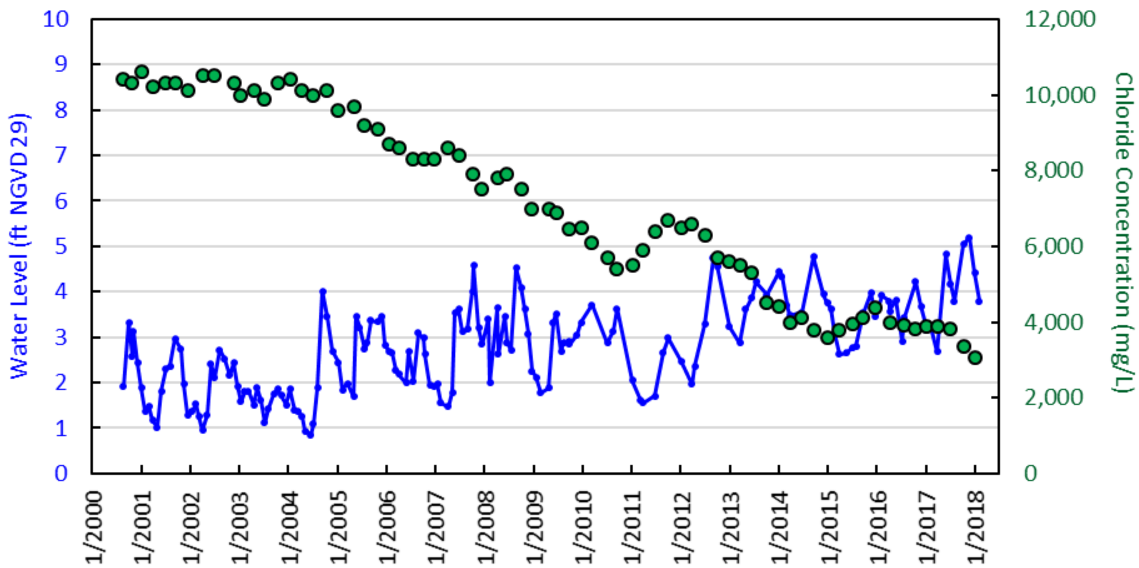

Figure D-16. Water levels and chloride concentrations in monitor well PB-1707 (183 feet deep) in Delray Beach, southeastern Palm Beach County.

In the Boca Raton coastal area, chloride concentrations near the base of the aquifer remain around 40 mg/L, as shown in USGS well PB-1669 (**Figure D-17**). Because water levels rarely are below 4 feet National Geodetic Vertical Datum of 1929 (NGVD29), the saltwater interface has remained seaward of this well location.

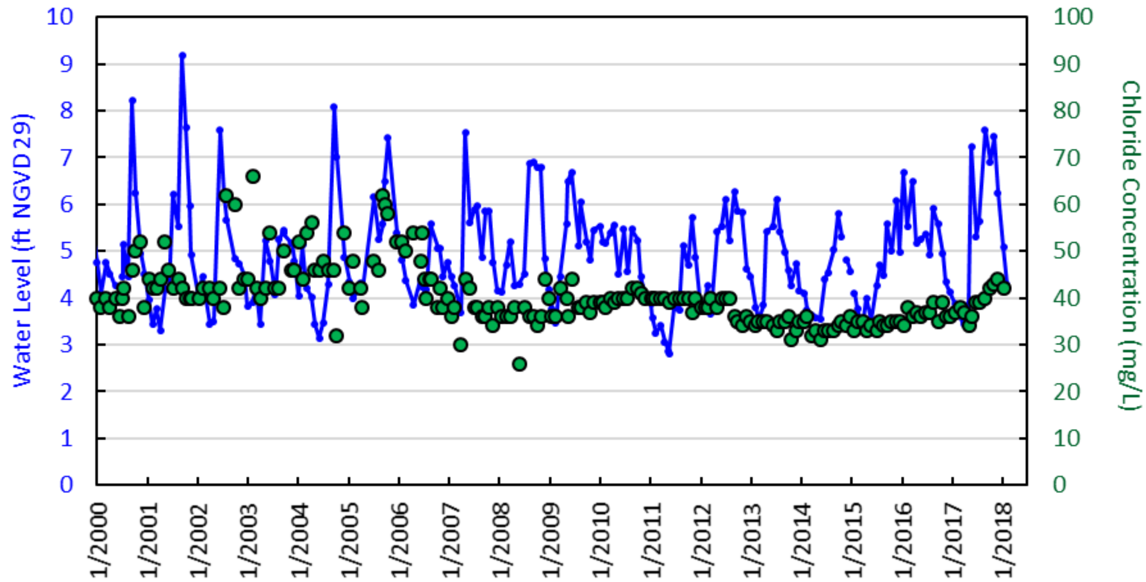

Figure D-17. Water levels and chloride concentrations in monitor well PB-1669 (131 feet deep) in Boca Raton, southeastern Palm Beach County.

Broward County

The 2009 and 2014 saltwater interface positions and PWS wellfield protection areas for Broward County are shown in **Figure D-18**. Chloride concentrations were measured in 2014. A slight shift in the saltwater interface from 2009 to 2014 can be seen along approximately half of coastal Broward County. The changes in the extent of saltwater intrusion in 2014 resulted from improved spatial information, particularly in the area of the C-11 Canal, actual movement of the saltwater front, or a combination of both.

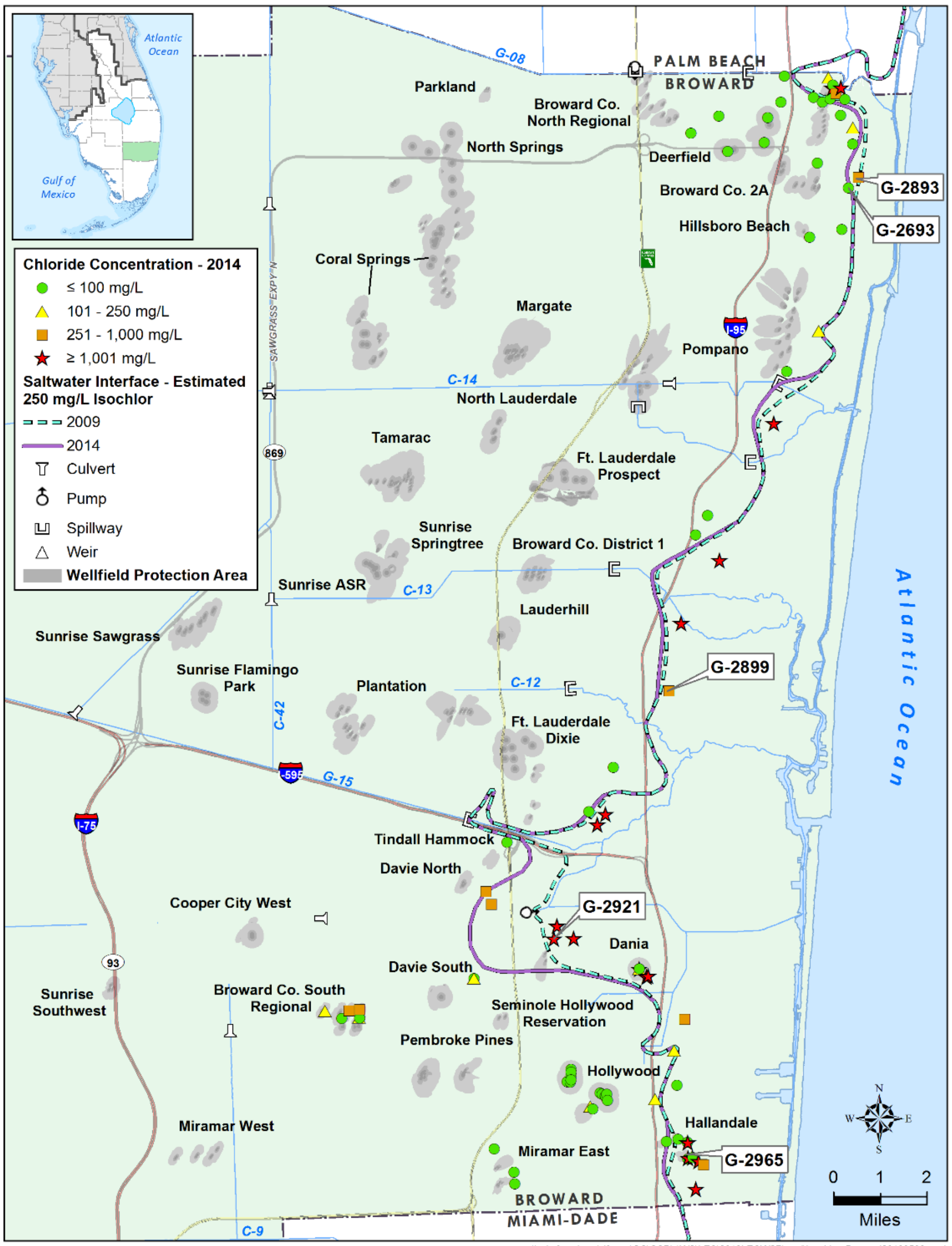

Figure D-18. Surficial aquifer system chloride monitoring locations, chloride concentrations, and 2009 and 2014 saltwater interface positions in Broward County.

USGS monitor well G-2893, on the eastern side of U.S. Highway 1 between Deerfield Beach and Hillsboro Beach, has experienced rapid increases in chloride concentration from 75 mg/L in 2007 to 900 mg/L in 2017. The induction logs for G-2893 (**Figure D-19**) indicate decreasing salinity from 10 to 40 feet bls but increasing salinity below 120 feet bls, with more rapid increases below 160 feet bls. However, in USGS well G-2693, located west of U.S. Highway 1 and southwest of well G-2893, chloride concentrations have remained relatively stable below 250 mg/L (**Figure D-20**), indicating the saltwater interface has not yet reached this location. These monitor wells are near the Broward County Water and Wastewater Services District 2A wellfield's easternmost wells, which are less than 1 mile west of U.S. Highway 1 and range from 120 to 175 feet bls.

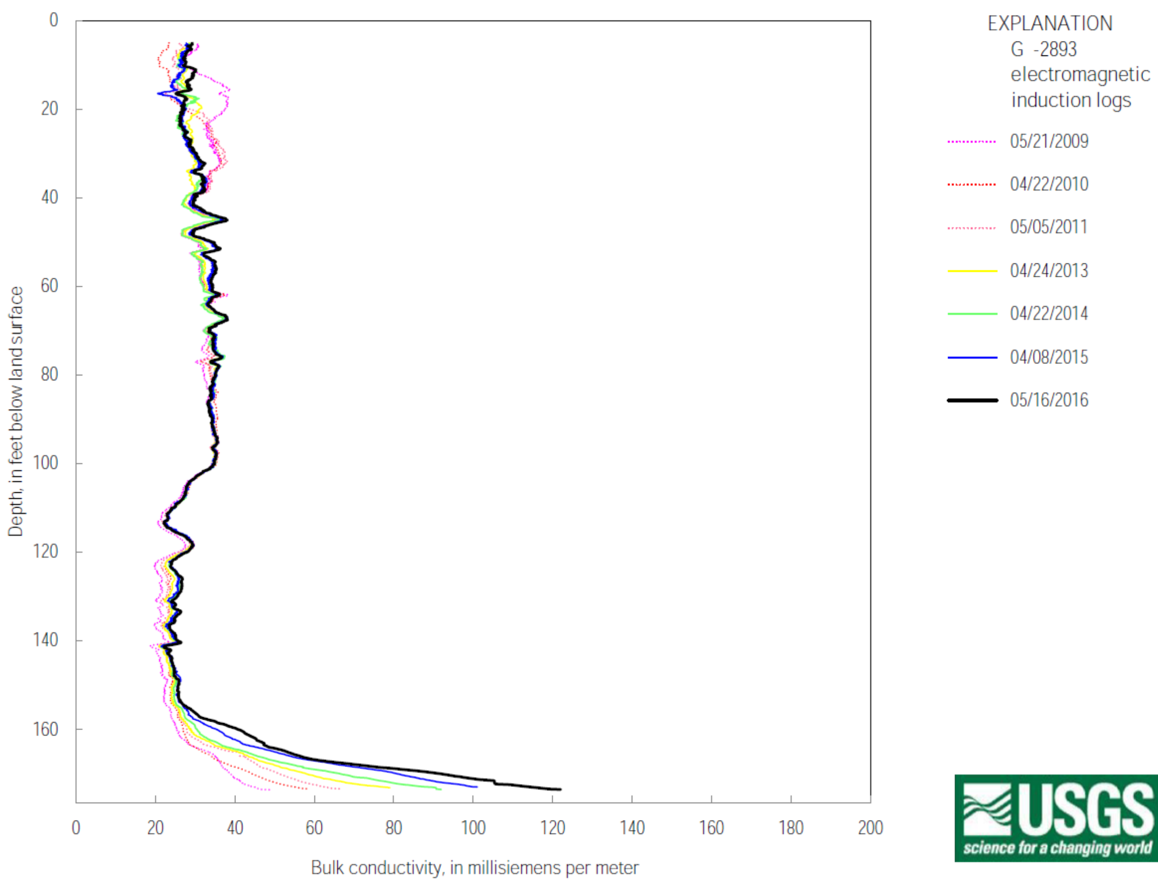

Figure D-19. Induction logs for monitor well G-2893 (177 feet deep) near Hillsboro Beach, southeastern Broward County (From: Valderrama 2017).

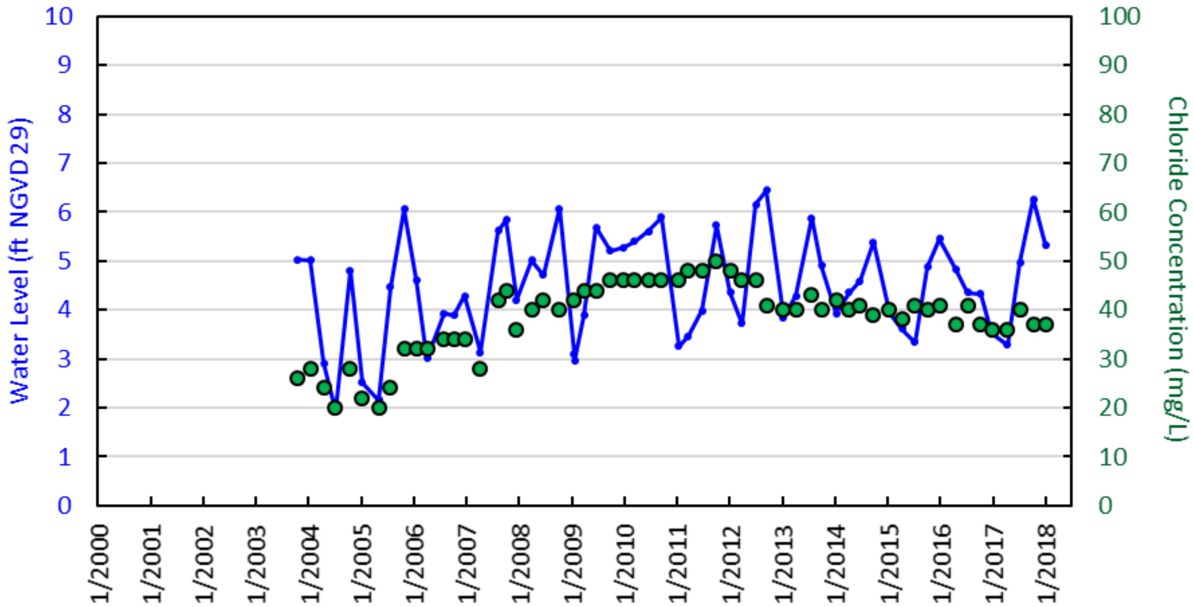

Figure D-20. Water levels and chloride concentrations in monitor well G-2693 (229 feet deep) in Hillsboro Beach, southeastern Broward County.

Monitor well G-2899 is less than 1 mile east of Interstate 95 and just south of Sunrise Boulevard in Fort Lauderdale. Chloride concentrations in the well began exceeding 250 mg/L in 2005 and have steadily increased to 1,000 mg/L in 2018 (**Figure D-21**), suggesting inland movement of the saltwater interface at this location. There are no PWS wellfields directly west of this monitor well.

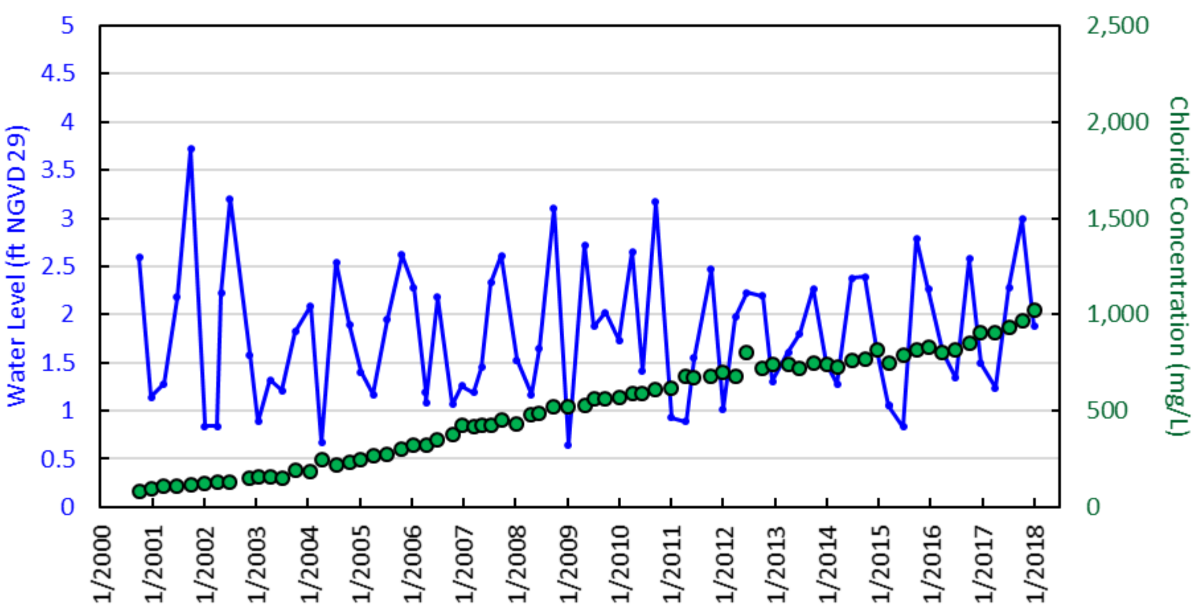

Figure D-21. Water levels and chloride concentrations in monitor well G-2899 (165 feet deep) in Fort Lauderdale, eastern Broward County.

The induction logs for USGS well G-2921 (**Figure D-22**) near Davie indicate the saltwater interface has been steadily moving inland between 65 and 200 feet bls, with a zone of higher salinity water at approximately 115 feet bls. The Town's PWS wells are approximately 4 miles west of well G-2921 and range from 100 to 150 feet bls. The saltwater interface is approaching the Town's North and South wellfields, especially in the more transmissive zone around 115 feet bls. Water quality is monitored by the Town of Davie at four locations between the saltwater interface and the PWS wellfields.

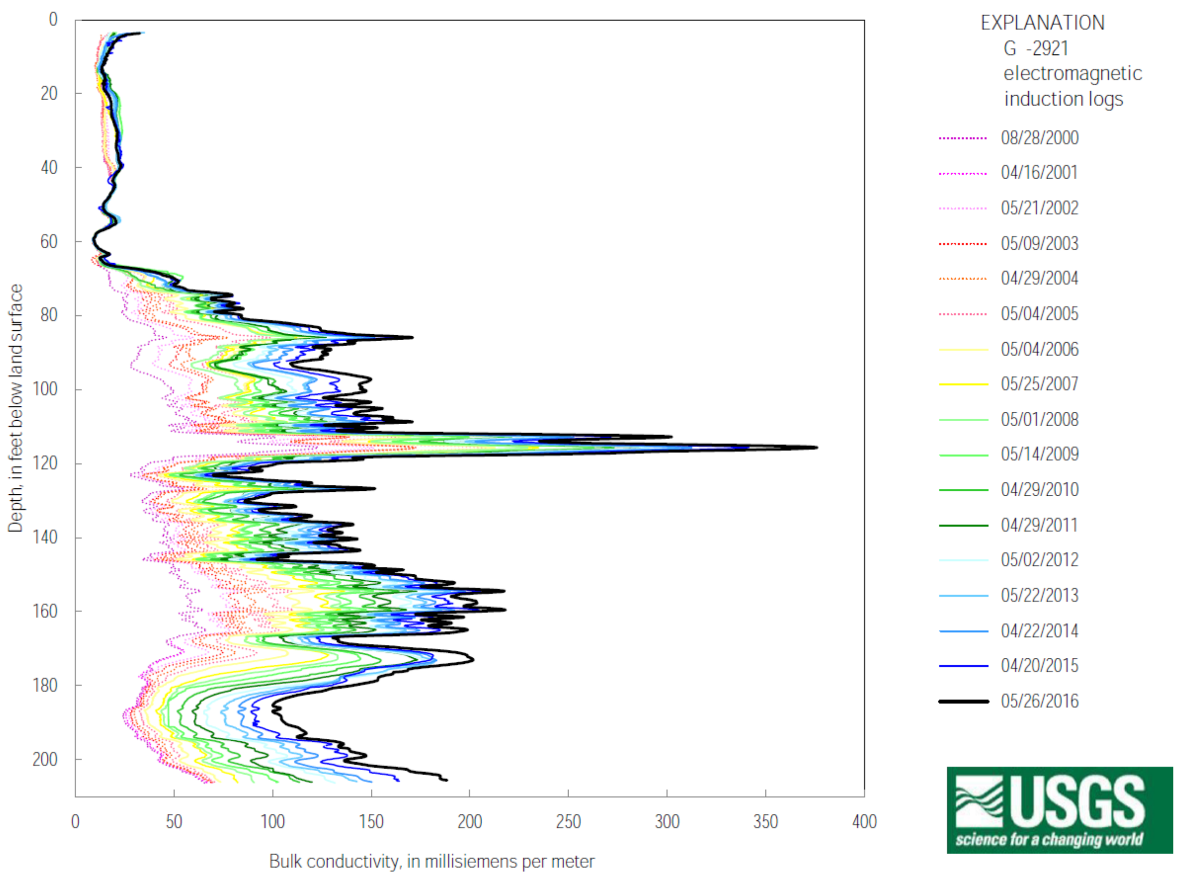

Figure D-22. Induction logs for monitor well G-2921 (206 feet deep) near Davie, southeastern Broward County (From: Valderrama 2017).

The induction logs for well G-2965 suggest the saltwater interface is steadily moving inland below 145 feet bls (**Figure D-23**). The City of Hallandale's PWS wells are 66 to 107 feet bls where water quality has remained stable. The City's wells are operated to minimize upward movement of the brackish water below.

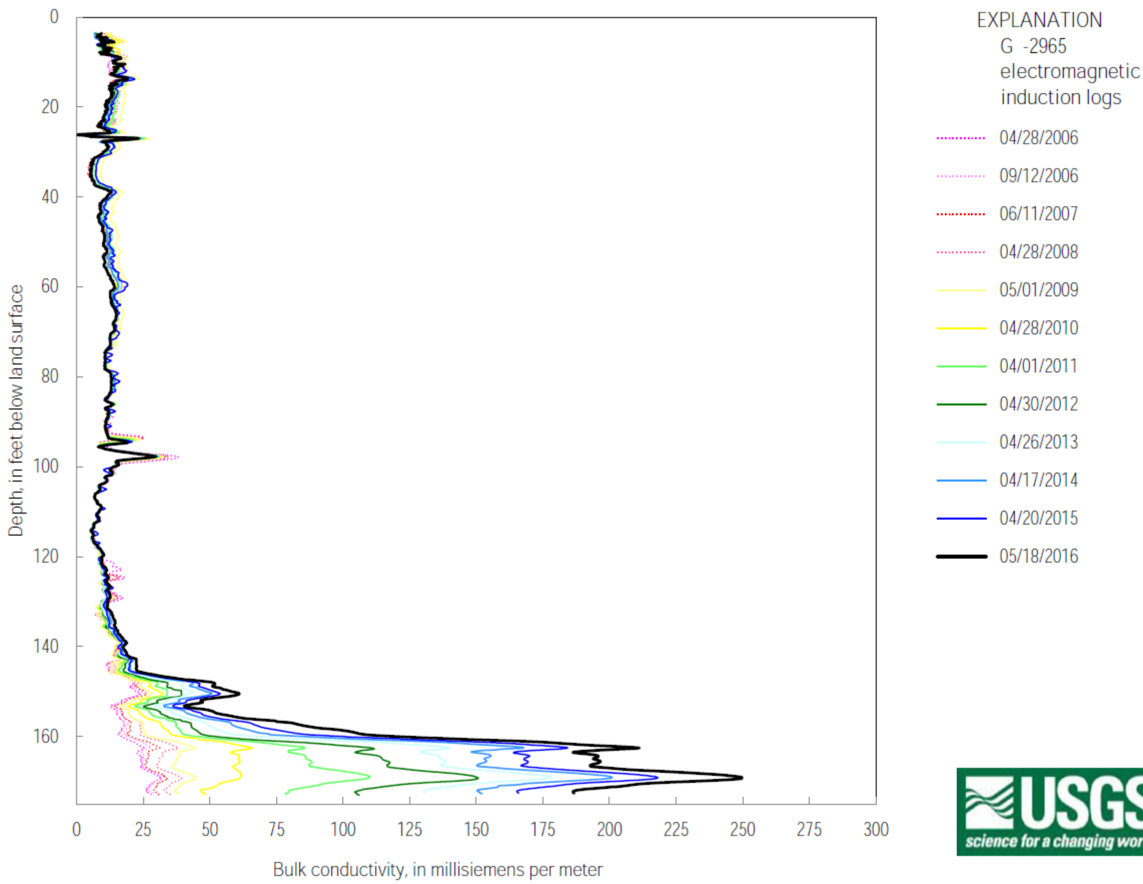

Figure D-23. Induction logs for monitor well G-2965 (175 feet deep) in Hallandale, eastern Broward County (From: Valderrama 2017).

Miami-Dade County

The USGS 2009, 2011, and 2016 saltwater interface positions for Miami-Dade County are shown in **Figure D-24** (Prinos et al. 2014; Prinos 2017). Chloride concentrations were measured in 2017. As with Broward County, some areas show minor inland movement of the saltwater interface along the coast, with the greatest movement in southern Miami-Dade County.

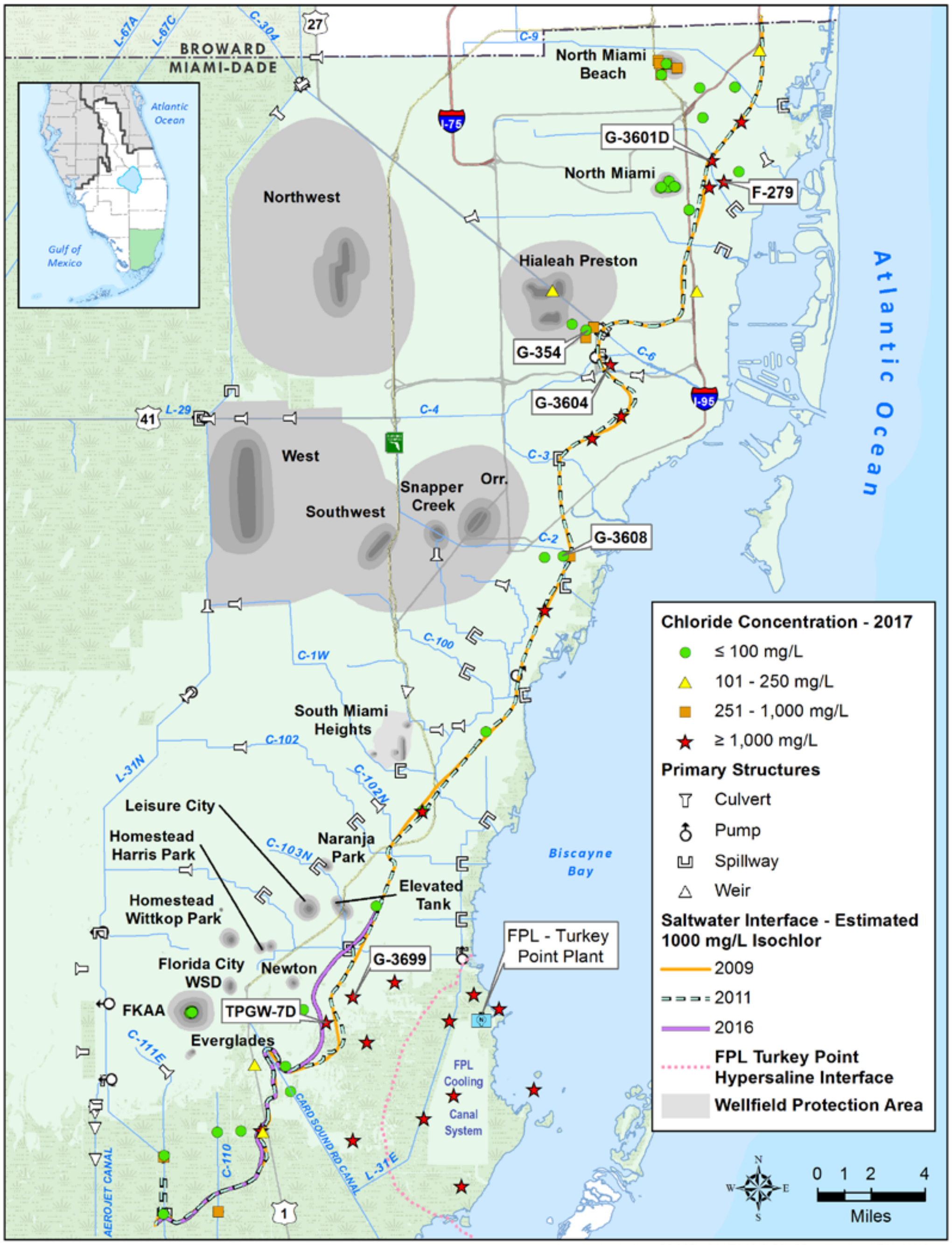

Figure D-24. Surficial aquifer system chloride monitoring locations, chloride concentrations, and 2009, 2011, and 2016 saltwater interface positions in Miami-Dade County.

The induction logs for monitor well G-3601D indicate water quality between 50 and 100 feet bls improved from 2013 to 2016, while salinity increases noticeably slowed in deeper areas (**Figure D-25**). The City of North Miami PWS wellfield is west of this monitor well and has production wells from 45 to 65 feet bls and from 100 to 125 feet bls. SAS wellfield withdrawals have been capped since 2002 due to salinity concerns. The induction logs for 2014 to 2016 indicate decreased salinities in the aquifer from 50 to 100 feet bls but continued salinity increases below 100 feet bls.

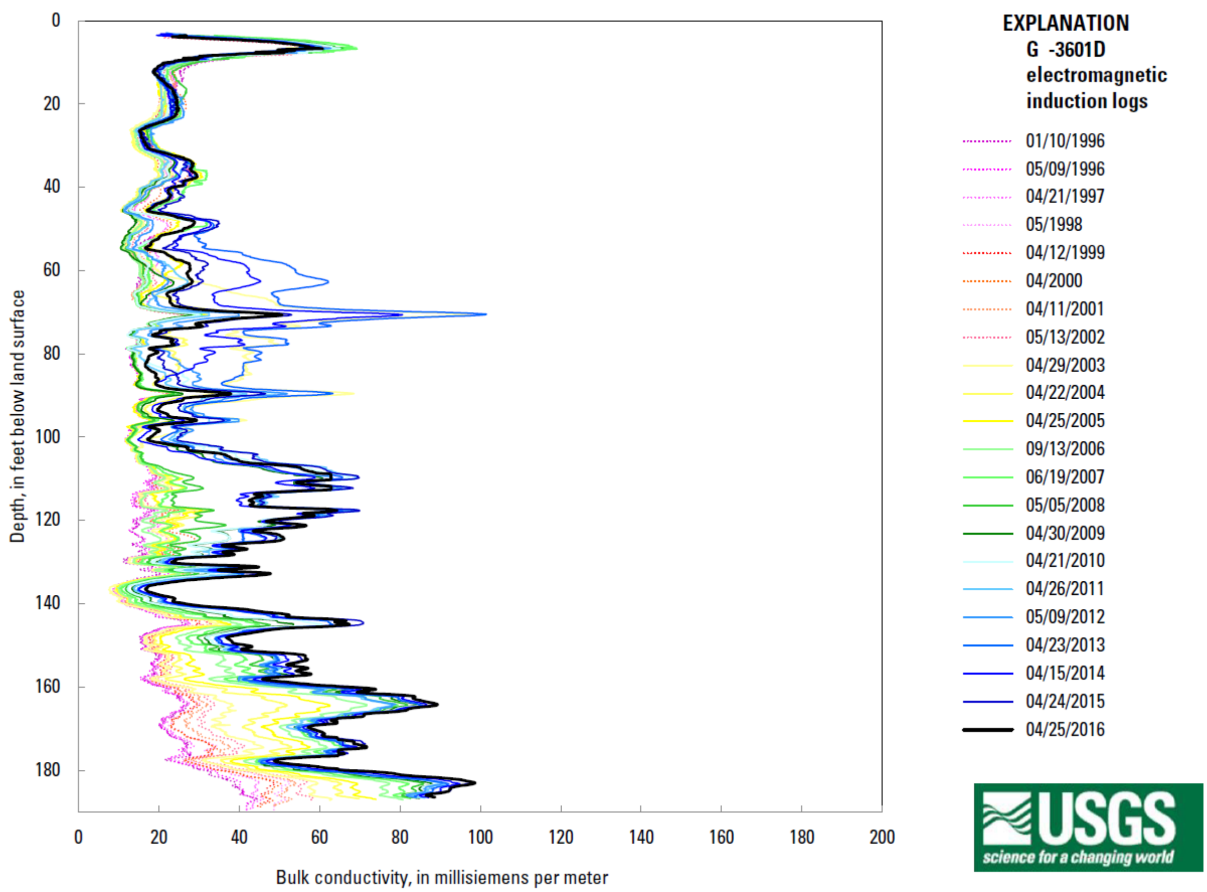

Figure D-25. Induction logs for monitor well G-3601D (190 feet deep) in North Miami, northeastern Miami-Dade County (From: Valderrama 2017).

Approximately 1 mile southeast of well G-3601D, USGS monitor well F-279 has chloride concentration and water level data from 1940 to present. Although the saltwater interface has migrated inland beyond this monitor well (**Figure D-26**), the data are valuable for determining the rate of inland movement.

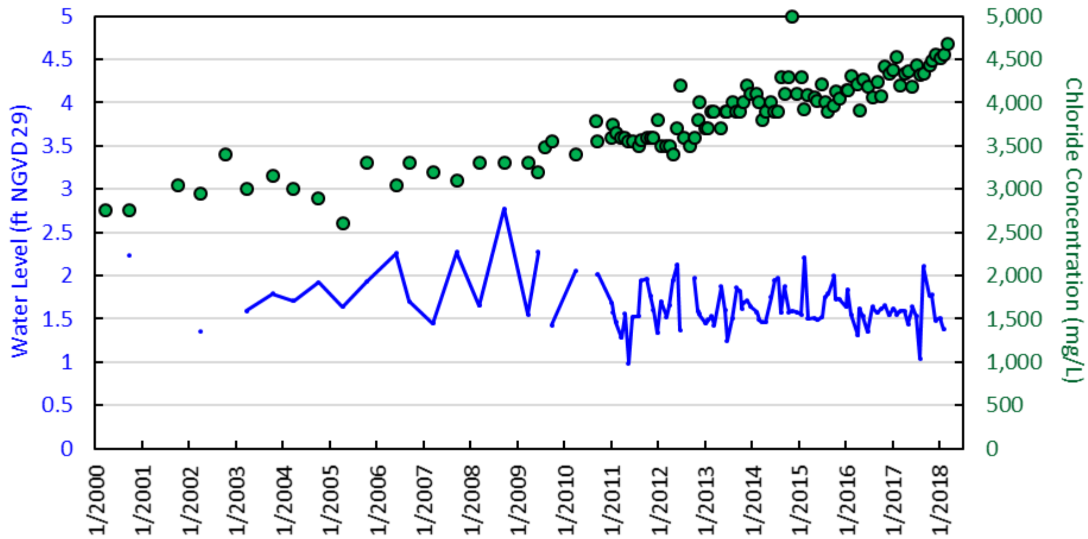

Figure D-26. Water levels and chloride concentrations in monitor well F-279 (116 feet deep) in North Miami, northeastern Miami-Dade County.

The Miami-Dade Water and Sewer Department (MDWASD) saltwater interface monitor well G-354 (**Figure D-27**) is upstream of the S-26 salinity control structure and east of the Hialeah, Preston, and Miami-Springs PWS wellfields. Combined pumpage from these three wellfields has been capped since the early 1990s to prevent pollution from western sources. PWS wells in these wellfields range from 107 to 115 feet bls. Chloride concentrations have been decreasing and are less than 50 mg/L at this location, likely due to the S-26 structure's ability to maintain water levels.

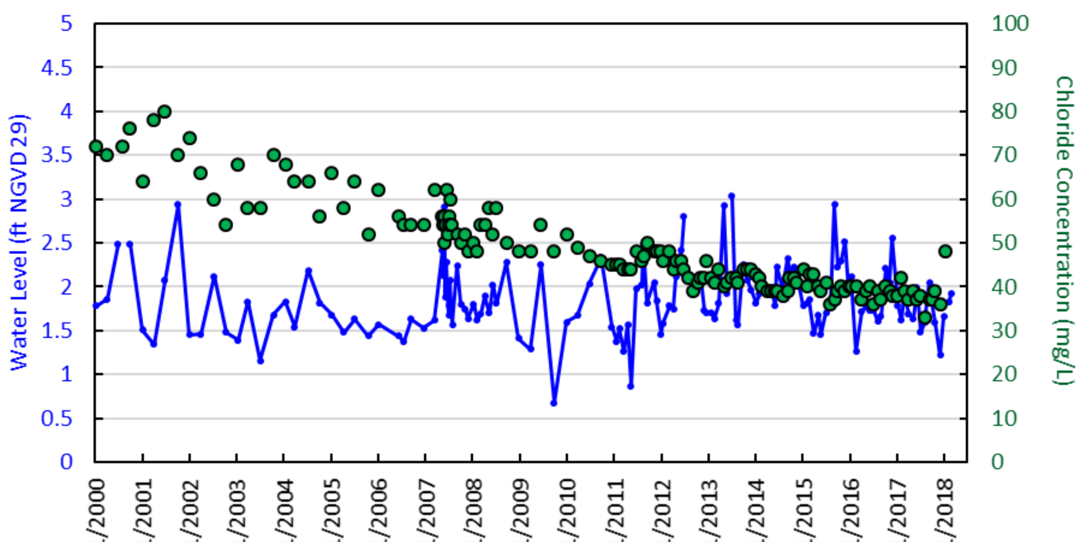

Figure D-27. Water levels and chloride concentrations in monitor well G-354 (92 feet deep) in Hialeah, northwestern Miami-Dade County.

Monitor well G-3604 is downstream of the S-26 salinity control structure. Salinity at this location has steadily increased below 95 feet bls; however, in 2010, chloride concentrations began to increase at shallower depths, and by 2016, inland movement of the saltwater interface was observed at approximately 85 feet bls (**Figure D-28**).

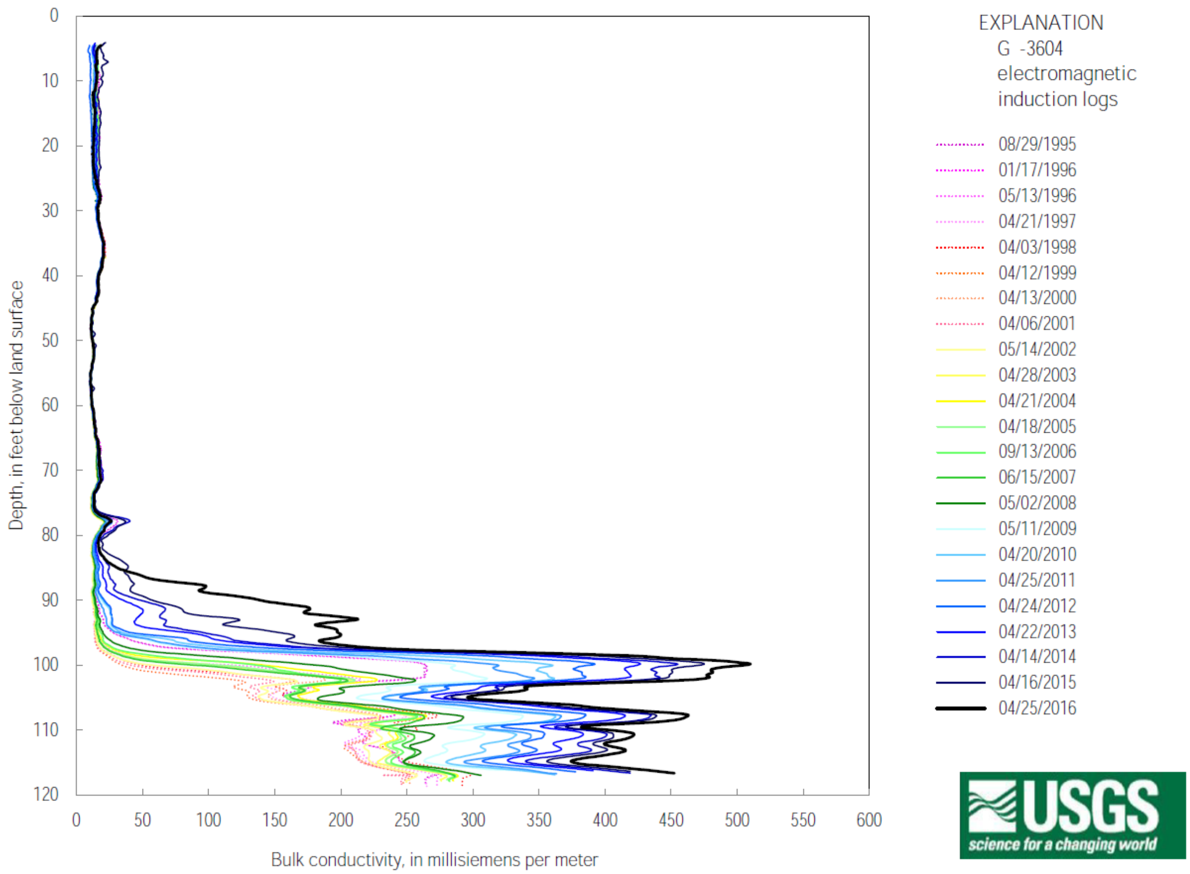

Figure D-28. Induction logs for monitor well G-3604 (120 feet deep) near Miami Springs, east-central Miami-Dade County (From: Valderrama 2017).

Water quality in monitor well G-3608, east of the MDWASD Orr and Snapper Creek wellfields, has fluctuated over time. Water quality has improved since 2005 and there is no indication of the saltwater interface at this location (**Figure D-29**). PWS wells in these wellfields range from 40 to 100 feet bls.

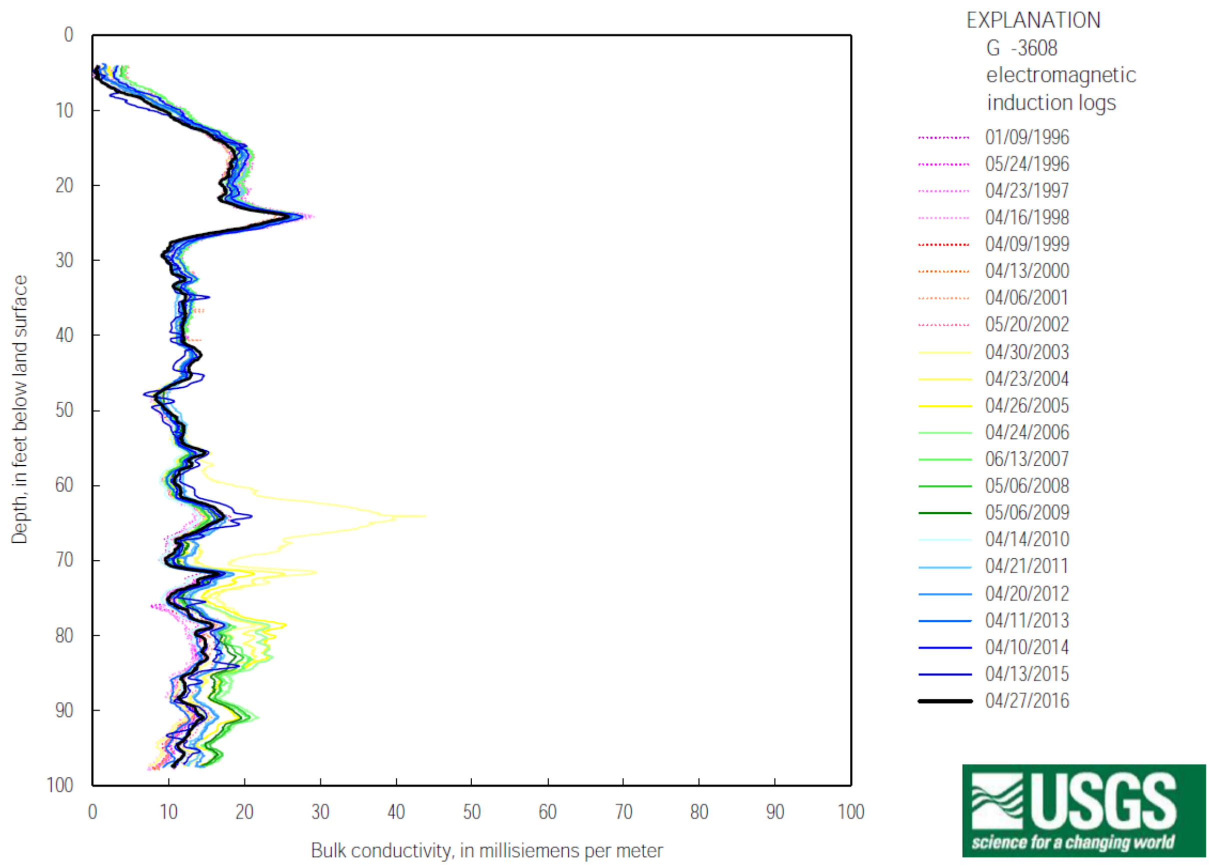

Figure D-29. Water levels and chloride concentrations in monitor well G-3608 (100 feet deep) in South Miami, central Miami-Dade County (From: Valderrama 2017).

Monitor well G-3699 is east of the MDWASD Newton wellfield, which is the closest of the southern Miami-Dade wellfields to the saltwater interface. The induction logs (**Figure D-30**) illustrate increasing salinity below 60 feet bls. The Newton PWS wells withdraw from 50 to 65 feet bls.

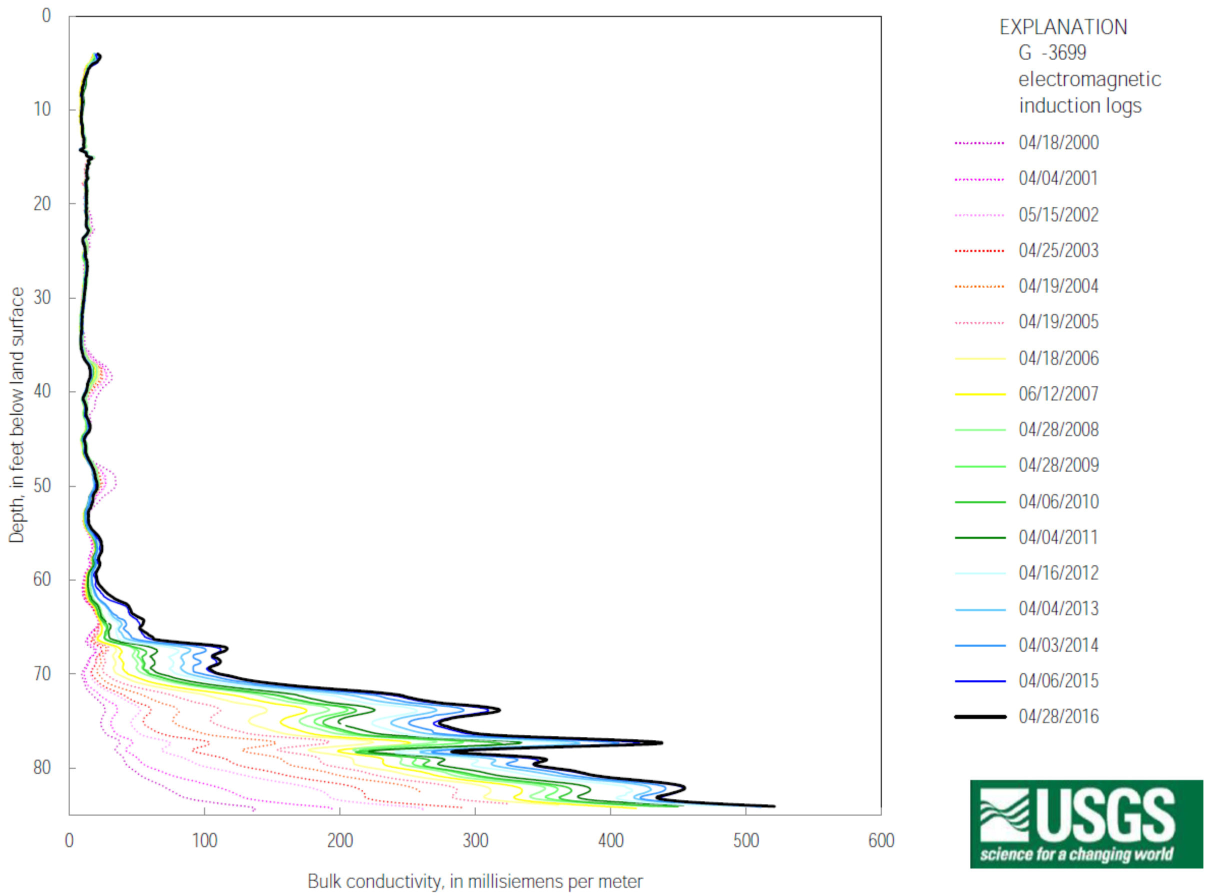

Figure D-30. Induction logs for monitor well G-3699 (88 feet deep) near Homestead, southern Miami-Dade County (From: Valderrama 2017).

The FPL Turkey Point Plant, approximately 8 miles east of Florida City, operates a cooling canal system that encompasses 5,900 acres and 160 miles of shallow canals in hydrologic contact with the Biscayne aquifer (**Figure D-24**). Since the system began operations in the early 1970s, a hypersaline (salinity greater than ocean water) plume has formed beneath it that has migrated west away from the system within the lower of two high-flow zones, not in the deepest (less permeable) part of the Biscayne aquifer. The approximate extent of the hypersaline plume was estimated by a controlled-source electromagnetic survey (Enercon 2016) and chloride concentration data from monitor wells. Additionally, a local groundwater flow and solute transport model was developed to determine historical conditions that contributed to the present configuration of the hypersaline plume. The model was used to simulate different aquifer remediation system designs (Tetra Tech 2016).

The FDEP, SFWMD, and Miami-Dade County monitor the hypersaline plume through an extensive network of monitor wells at varying depths. Approximately 5 miles west of the cooling canal system is a cluster of three monitor wells (**Figure D-24**): TPGW-7S (26 feet bls), TPGW-7M (52 feet bls), and TPGW-7D (114 feet bls). Historical water level and water quality data are from monitor well TPGW-7D. Chloride concentrations in monitor wells TPGW-7S and TPGW-7M are less than 50 mg/L and not shown due to scale. However, salinity in the lower high-flow zone began increasing in 2014 (**Figures D-31** and **D-32**). Remedial measures being implemented by FPL through regulatory agreements with the FDEP and Miami-Dade County include 1) Biscayne aquifer recovery wells along the western edge of the cooling canal system, 2) a deep injection well system to dispose of the recovered hypersaline groundwater, and 3) brackish Upper Floridan aquifer well water conveyed into the cooling canal system to reduce salinity. These measures are meant to abate the hypersaline migration and retract the hypersaline conditions back to the FPL property boundary.

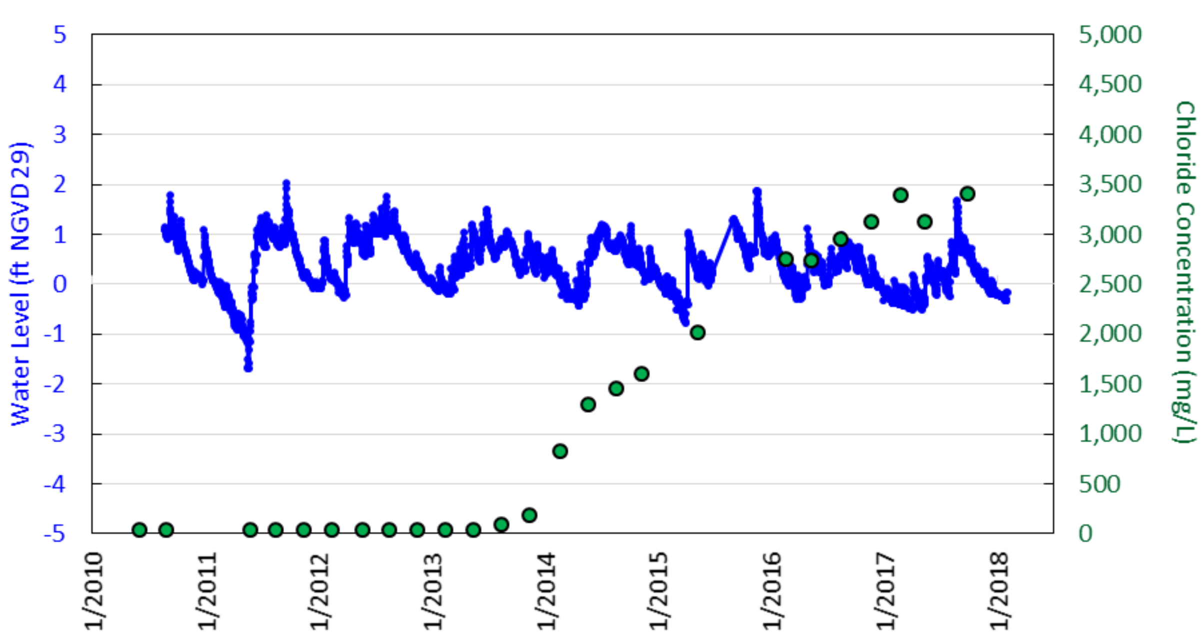

Figure D-31. Chloride concentrations in monitor well TPGW-7D (114 feet deep) in Homestead, southeastern Miami-Dade County.

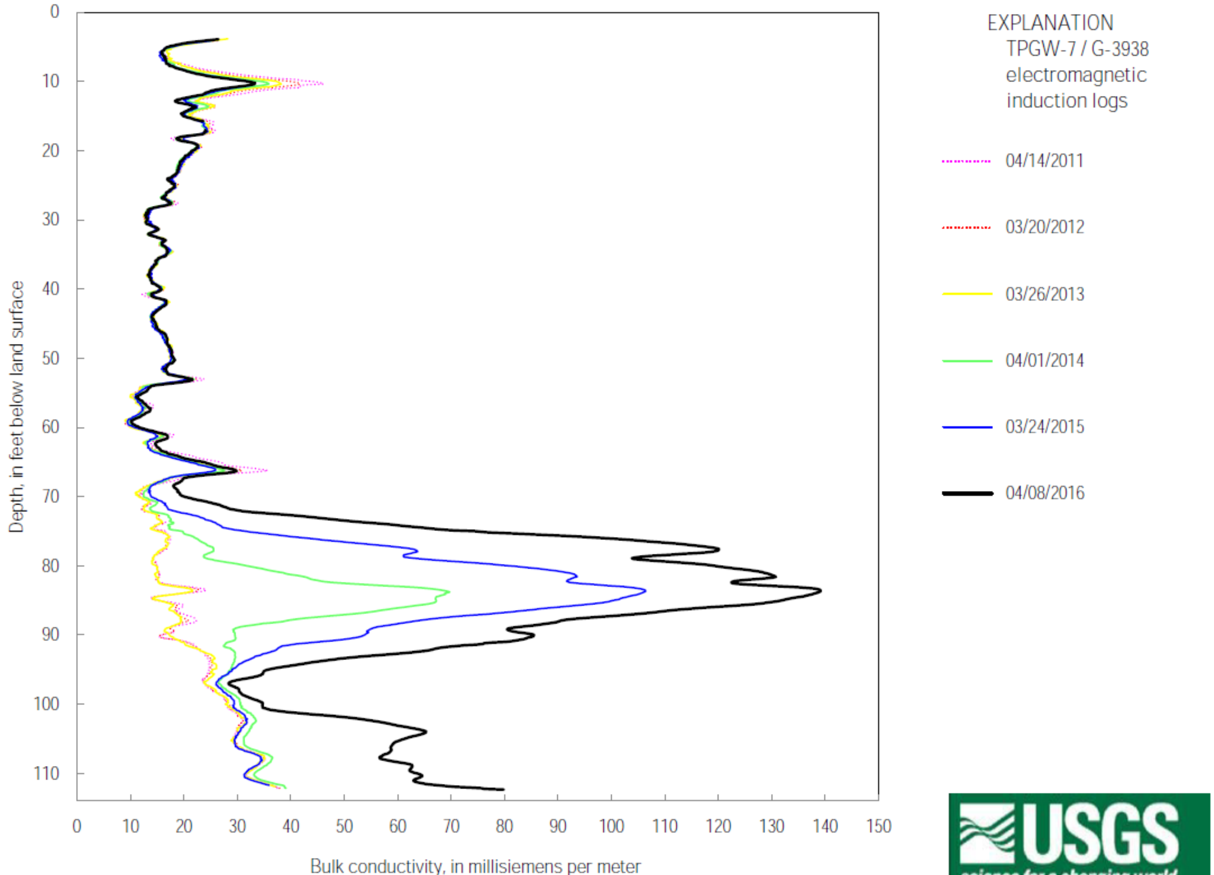

Figure D-32. Induction logs for monitor well TPGW-7D (84 feet deep) in Homestead, southeastern Miami-Dade County (From: Valderrama 2017).

Utilities Vulnerable to Dry Conditions

In 2007, the SFWMD identified PWS utilities with water supply sources near the saltwater interface that could be vulnerable to saltwater intrusion or reduced availability during severe drought conditions (SFWMD 2007). The purpose of the SFWMD's evaluation was to increase awareness of the potential for saltwater intrusion in groundwater due to a lowered water table, reduced precipitation, and resulting diminished aquifer recharge. The SFWMD identified PWS utilities' existing water supply sources, including AWS sources; planned projects; and initiatives to diversify water supply sources, reduce vulnerability, and ensure a more reliable water supply during future dry periods. These considerations are for water supply planning purposes only and do not constitute any regulatory determination or agency action regarding the utilities noted herein.

Considerations used in this updated evaluation include whether the utility had wellfields near a saltwater source (e.g., ocean, relict seawater, hypersaline plume), the availability of other water sources (e.g., inland wellfield, AWS sources, interconnects with other utilities), and the ability of the alternatives to meet demands. The following utilities, listed north to south, in the LEC Planning Area have wellfields near the saltwater interface and do not have a western wellfield, have not developed alternative water sources, and/or have limited ability during a drought to meet user needs through interconnects with other utilities:

- Town of Hillsboro Beach
- City of Dania Beach
- City of Hallandale Beach
- MDWASD – South Dade wellfields
- City of Homestead
- Florida City Water and Sewer Department

The following utilities, listed north to south, have an SAS wellfield near the saltwater interface but also have access to other water sources during drought conditions:

- Village of Tequesta
- Town of Jupiter
- City of Riviera Beach
- City of Lake Worth Utilities
- Town of Lantana
- City of Boynton Beach
- City of Delray Beach Water and Sewer Department
- City of Deerfield Beach
- Broward County Water and Wastewater Services District 2A
- City of Pompano Beach
- City of Fort Lauderdale – Dixie wellfield
- Town of Davie
- City of Hollywood
- City of North Miami Beach
- City of North Miami
- MDWASD – Miami Springs and Hialeah Preston wellfields
- Florida Keys Aqueduct Authority

Wellfields along the coast are particularly susceptible to saltwater intrusion during drought conditions. Utilities can respond to the threat of saltwater intrusion by:

- Shifting pumpage to inland wells to reduce demand on coastal wells;
- Reducing withdrawals from the SAS by using the FAS as an AWS source;
- Employing additional water conservation methods to reduce overall water demand; and
- Expanding water reuse programs to reduce potable and self-supplied SAS withdrawals for irrigation.

County USGS Groundwater Models

Broward County

The USGS, in cooperation with the Broward County Community Resilience Division, used SEAWAT, a three-dimensional solute transport model, to examine the causes of saltwater intrusion and predict the effects of future alterations to the hydrologic system on salinity distribution within the SAS in the southern and central portions of coastal Broward County (Hughes et al. 2016). The model results were used to evaluate the sensitivity of groundwater salinity distribution to sea level rise and groundwater pumping by simulating the potential effects of variable rates of sea level rise, increased pumping, moving a salinity control structure, and using recharge wells on the future distribution of salinity in the Biscayne aquifer. USGS interpretations and conclusions of the model results suggested the following:

- The model generally represents the observed greater westward extent of elevated salinity in the central portion of the county (near the North New River Canal and southeast of Hallandale) relative to the northern and southern parts of the county.
- With increasing rates of sea level rise, the saltwater interface advances progressively inland and salinity increases at wellfields near the saltwater interface.
- Results of sensitivity testing indicate the extent of elevated salinity, in areas where the source of salt water is largely offshore from the Atlantic Ocean, is most sensitive to pumping, and in areas where the source of salinity is downward leakage of brackish water from canals, it is most sensitive to sea level rise.
- Increases in future pumping near the saltwater interface may cause the interface to advance while decreases may cause it to retreat as the aquifer is sensitive to wellfield pumpage.
- Repositioning of salinity control structures may prevent the saltwater interface from advancing farther inland; however, benefits are localized.
- Installation of freshwater recharge wells has localized aquifer benefits but does not noticeably affect the saltwater interface or salinity concentrations at coastal wellfields.

Miami-Dade County

The USGS used a coupled groundwater/surface water model (MODFLOW-NWT and Surface-Water Routing Process) to evaluate the effects of increased groundwater pumpage from the SAS and of increased sea level on canal leakage, regional groundwater flow, and the position of the saltwater interface (Hughes and White 2016). USGS interpretations and conclusions of the model results suggested the following:

- Saltwater intrusion could occur at the MDWASD Miami Springs, Hialeah, and Preston wellfields if operated at currently permitted or increased groundwater pumping rates.
- The SFWMD canal system and salinity control structures limit the adverse effects of proposed groundwater pumping increases on water level changes and saltwater intrusion.
- Higher sea level caused increased water table elevations in urban areas and decreased hydraulic gradients across the surface water and groundwater system, with the largest increase in water table elevations occurring seaward of the salinity control structures.
- Increased groundwater withdrawals decreased water table gradients, which reduced groundwater inflow and outflow, canal exchanges, and surface water inflow and outflow through salinity control structures.

Despite some limitations related to scale and climate variability, the model represents the complexities of the interconnected surface water and groundwater systems that affect how the systems respond to groundwater pumpage, sea level rise, and other hydrologic stresses. The model also quantifies the relative effects of groundwater pumpage and sea level rise on surface water and groundwater systems.

FLORIDAN AQUIFER SYSTEM

The SFWMD and USGS monitor the FAS through regional networks of monitor wells and through permittees as part of permit monitoring requirements for water use (SFWMD) and injection wells (Florida Department of Environmental Protection) (**Figure D-33**).

The SFWMD's Regional Floridan Groundwater (RFGW) monitoring program consists of a network of monitor wells used to collect water level and water quality data, which are analyzed to evaluate the water supply potential of the FAS (SFWMD wells on **Figure D-33**). Through long-term systematic data collection, a better understanding of the hydrogeologic system can help evaluate current conditions, detect temporal trends, and develop and calibrate regional groundwater models.

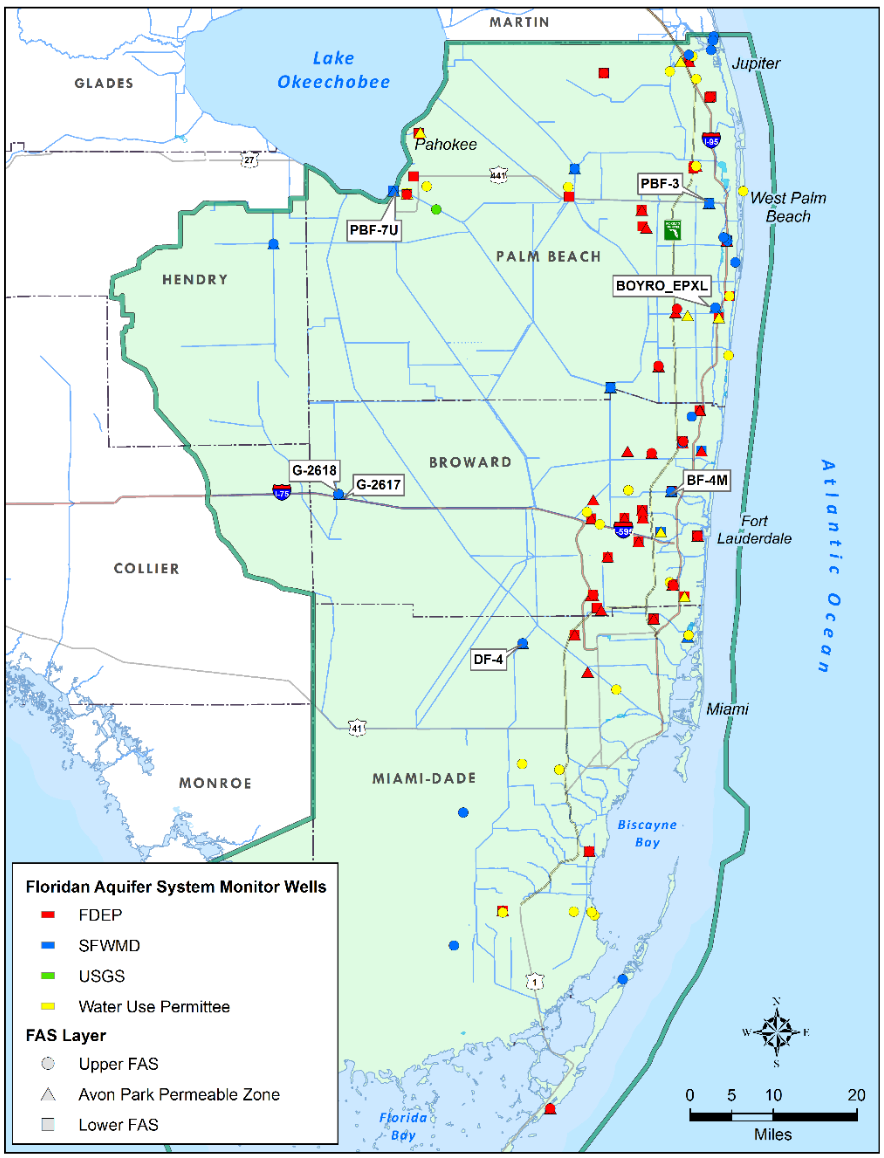

Figure D-33. Floridan aquifer system monitor well locations and monitoring entity, in the LEC Planning Area.

Upper Floridan Aquifer

In the LEC Planning Area, four wells completed in the Upper Floridan aquifer (UFA) that have long-term water level and water quality (chloride concentrations and TDS) data were evaluated for this plan update (**Tables D-2** and **D-3**). Data from these wells indicate seasonal variations in water levels, but overall water levels have remained relatively stable during the period of record. One exception is well DF-4, which had a period of water level decline in 2012 but returned to historical levels in 2015. Water quality data were examined for the same four UFA wells and overall the trend is relatively stable, with chloride concentrations ranging from 557 to 2,800 mg/L (**Figures D-34** to **D-37**).

Several PWS utilities in the LEC Planning Area use the UFA as an AWS source with reverse osmosis (RO) treatment. Nearly all PWS utilities in the LEC Planning Area that use the UFA have experienced water quality degradation in one or more production wells. However, overall water quality of the UFA has remained relatively stable, and with appropriate management, expanded use of this AWS source can help meet 2040 demands.

Table D-2. Upper Floridan aquifer monitor wells in the LEC Planning Area with long-term water level and water quality data.

Well Name	County	Open Hole Depth Interval (feet bls)	Chloride Concentration (mg/L)		Period of Record
			Minimum	Maximum	
PBF-3	Palm Beach	1,050-1,252	1,810	2,800	2/2003-3/2018
PBF-7U	Palm Beach	992-1,447	1,098	1,400	7/2002-3/2018
G-2618	Broward	1,104-1,164	557	1,100	7/2002-3/2018
DF-4	Miami-Dade	1,140-1,230	1,558	1,900	7/2002-3/2018

bls = below land surface; mg/L = milligrams per liter.

Table D-3. Minimum, maximum, and average groundwater levels (in feet NGVD29) for select Upper Floridan aquifer wells in the LEC Planning Area.

Well Name	Minimum Level	Maximum Level	Average Level
PBF-3	44.99	47.78	46.37
PBF-7U	51.85	56.12	53.48
G-2618	57.87	60.93	59.72
DF-4	31.90	53.13	49.41

NGVD29 = National Geodetic Vertical Datum of 1929.

Water levels in well PBF-3, located in eastern Palm Beach County, seasonally fluctuate approximately 2 to 3 feet, but the long-term trend is stable (**Figure D-34**). Chloride concentrations fluctuate between 2,000 and 2,700 mg/L, with no discernable trend.

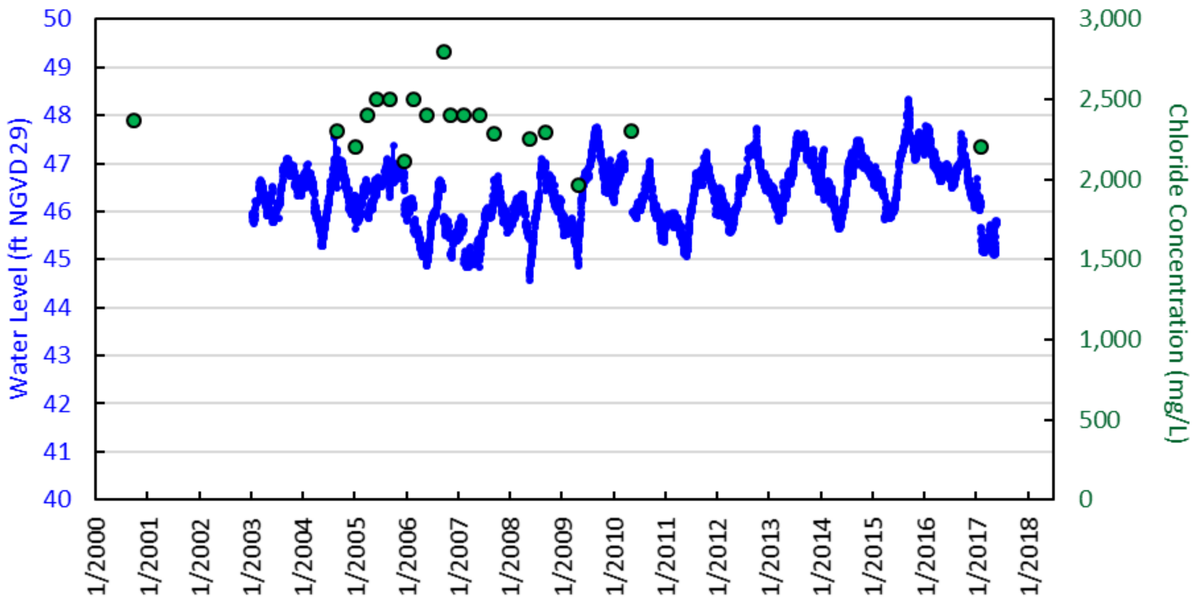

Figure D-34. Water levels and chloride concentrations in Upper Floridan aquifer monitor well PBF-3 (1,252 feet deep), eastern Palm Beach County.

Water levels in well PBF-7U, in western Palm Beach County, seasonally fluctuate 1 to 2 feet, but the long-term trend is relatively stable (**Figure D-35**). Chloride concentrations also are relatively stable, fluctuating 100 to 200 mg/L.

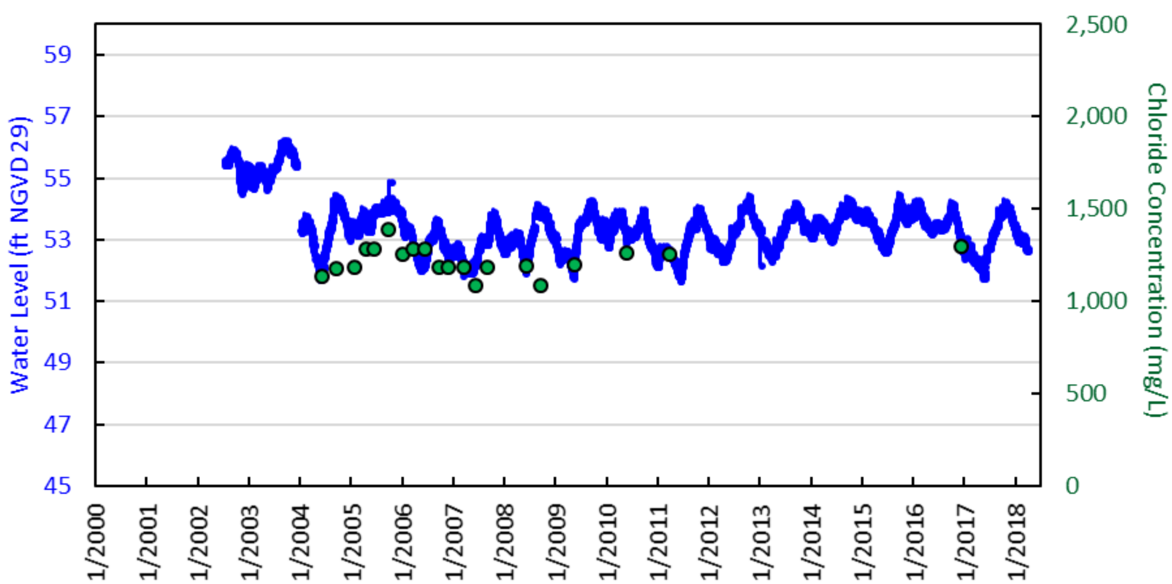

Figure D-35. Water levels and chloride concentrations in Upper Floridan aquifer monitor well PBF-7U (1,447 feet deep), western Palm Beach County.

Water levels in well G-2618, located along Alligator Alley in Water Conservation Area 3A in western Broward County, seasonally fluctuate approximately 3 feet, and there is variability over the long term (**Figure D-36**). A slight increasing trend in water levels began in 2013. Chloride concentrations have remained relatively stable at approximately 600 mg/L.

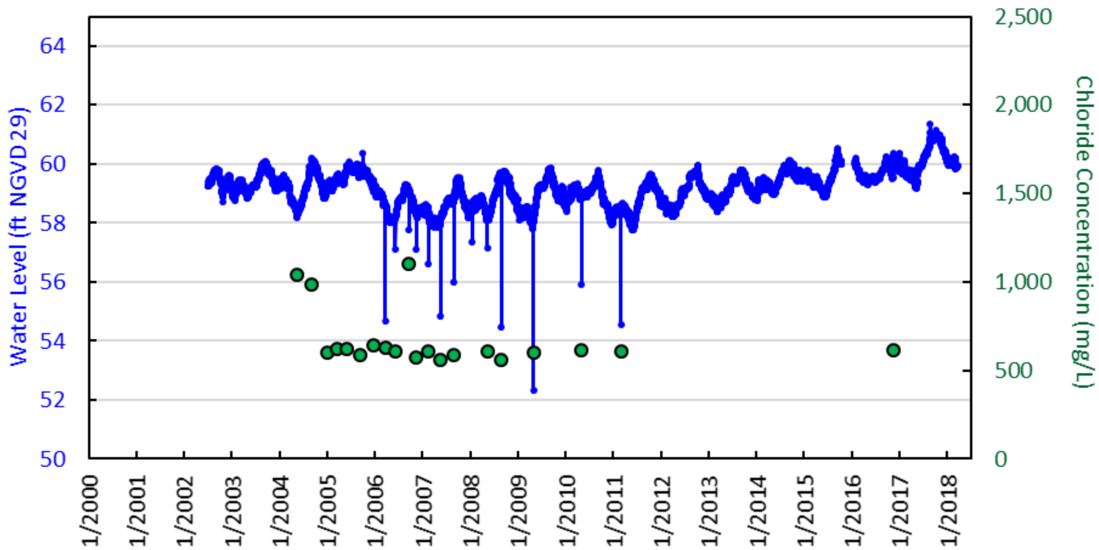

Figure D-36. Water levels and chloride concentrations in Upper Floridan aquifer monitor well G-2618 (1,164 feet deep), western Broward County.

Water levels in well DF-4, in northern Miami-Dade County, seasonally fluctuate approximately 2 to 3 feet, and there is variability over the long term (**Figure D-37**). A large (15 to 20 feet) water level decrease occurred between 2012 and 2015, possibly due to a nearby pumping well. However, water levels from 2015 to 2018 have rebounded and are similar to historical levels. Chloride concentrations have varied approximately 400 mg/L within a long-term stable trend.

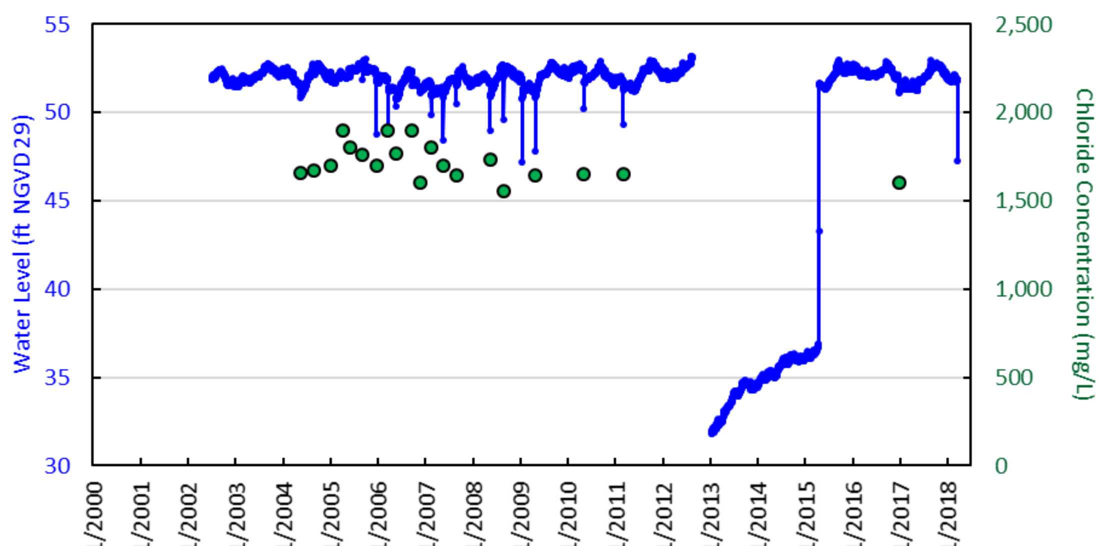

Figure D-37. Water levels and chloride concentrations in Upper Floridan aquifer monitor well DF-4 (1,230 feet deep), northern Miami-Dade County.

Avon Park Permeable Zone

In the LEC Planning Area, three wells completed in the Avon Park Permeable Zone (APPZ) that have long-term water level and water quality (chloride concentrations and TDS) data were evaluated for this plan update (**Tables D-4** and **D-5**). Water level data from these wells indicate seasonal variations, but overall, levels have remained relatively stable over the period of record.

Water quality data were examined for the same three APPZ wells (**Figures D-38** to **D-40**) and the resulting trends varied. Well BOYRO_EPXL showed relatively stable chloride concentrations between 2,200 and 2,400 mg/L. Wells BF-4M and G-2617 recently had increasing chloride concentrations but did not exceed their historical high values.

Table D-4. Avon Park Permeable Zone monitor wells in the LEC Planning Area with long-term water level and water quality data.

Well Name	County	Open Hole Depth Interval (feet bls)	Chloride Concentration (mg/L)		Period of Record
			Minimum	Maximum	
BOYRO_EPXL	Palm Beach	1,320-1,470	2,209	2,400	02/2007-03/2018
BF-4M	Broward	1,500-1,600	2,158	2,400	07/2002-03/2018
G-2617	Broward	1,648-1,726	576	1,190	07/2002-03/2018

bls = below land surface; mg/L = milligrams per liter.

Table D-5. Minimum, maximum, and average groundwater levels (in feet NGVD29) for select wells in the LEC Planning Area.

Well Name	Minimum Level	Maximum Level	Average Level
BOYRO_EPXL	46.63	49.41	48.16
BF-4M	44.55	48.07	46.50
G-2617	58.48	61.00	59.86

NGVD29 = National Geodetic Vertical Datum of 1929.

Water levels in well BOYRO_EXPL, in Boynton Beach, seasonally fluctuate 1 to 2 feet, but the long-term trend is relatively stable (**Figure D-38**). Notable dry seasons (e.g., 2007, 2009, 2011, 2017) are followed by rebounds in water levels to previous wet season levels.

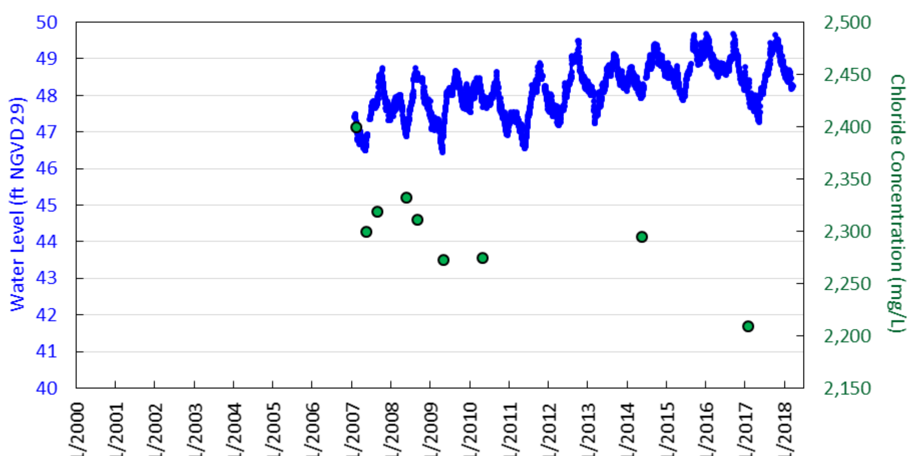

Figure D-38. Water levels and chloride concentrations in Avon Park Permeable Zone aquifer monitor well BOYRO_EXPL, eastern Palm Beach County.

Water levels in monitor well BF-4M steadily increased from 2002 to 2012 and have since leveled off (**Figure D-39**). Chloride concentrations ranged 250 mg/L over the past 11 years.

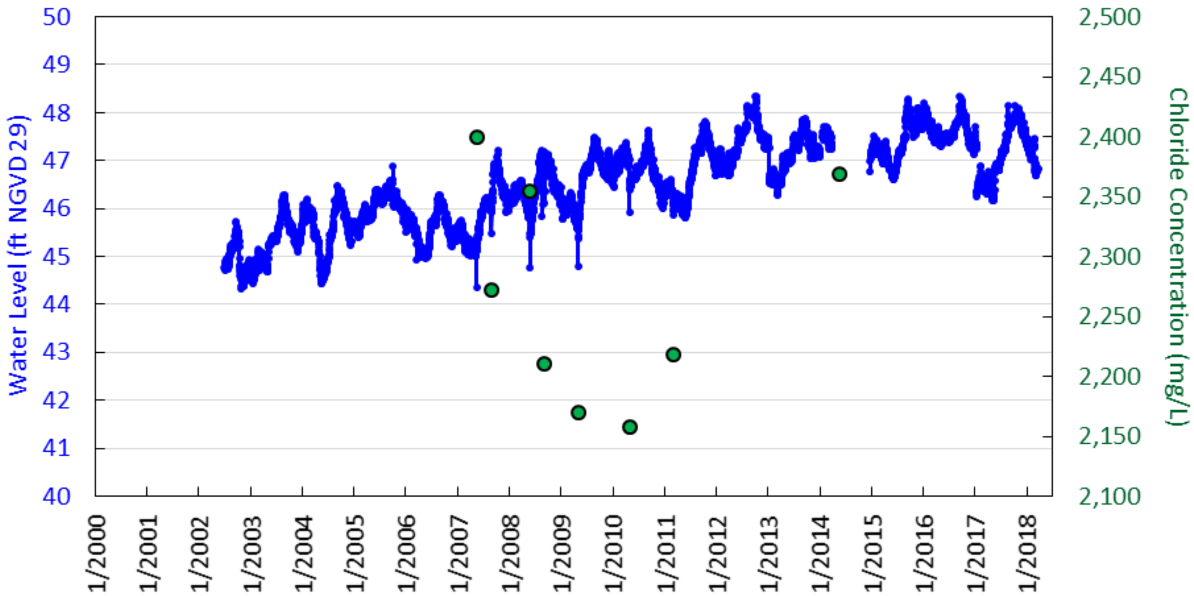

Figure D-39. Water levels and chloride concentrations in Avon Park Permeable Zone monitor well BF-4M, eastern Broward County.

Water levels in well G-2617, in western Broward County, seasonally fluctuate 1 to 2 feet, but the long-term trend is relatively stable (**Figure D-40**). Notable dry season levels are followed by rebounds in water levels to previous wet season levels.

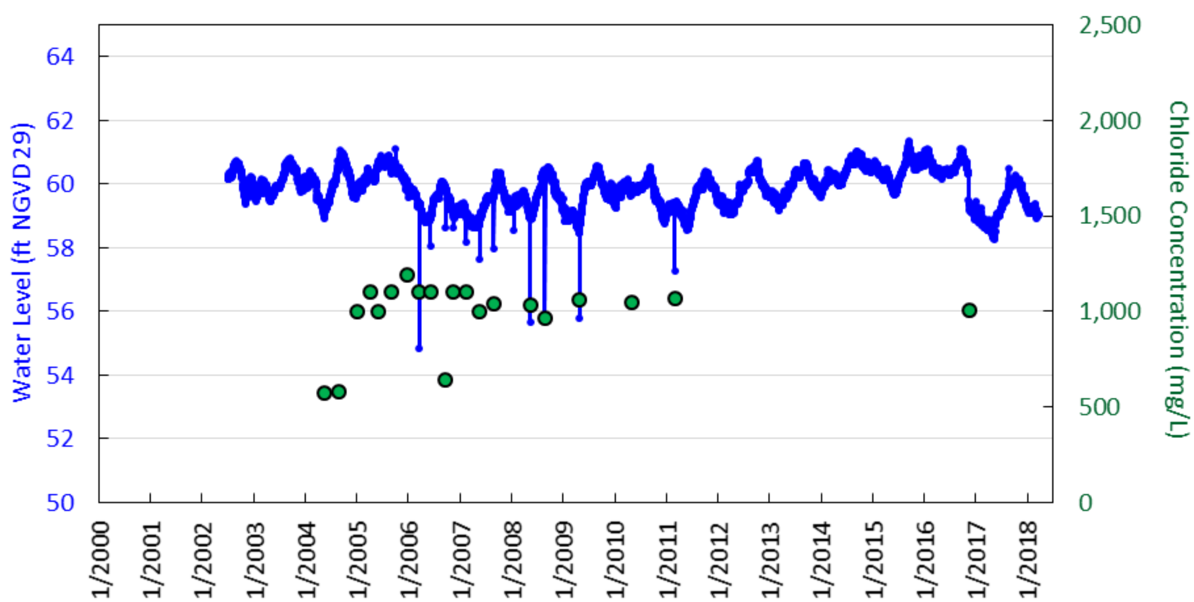

Figure D-40. Water levels and chloride concentrations in Avon Park Permeable Zone monitor well G-2617, western Broward County.

PWS Historical Salinity Trends

Historical FAS water quality data were examined for trends in select utility wellfields with multiple years of data within the LEC Planning Area. The following subsections summarize the chloride concentration data trends from nine wellfields during their respective periods of record.

Village of Tequesta (50-00046-W)

The Village of Tequesta has obtained a portion of its water supply from four FAS wells in the APPZ since 2000. The wells are completed to approximately 1,190 feet bls, with open holes to 1,700 feet bls. The wells are pumped at rates of approximately 1,200 gallons per minute (gpm), and three active wells pumped 1.09 mgd in 2016. Since 2004, the chloride concentration of water produced from the wells has averaged approximately 2,400 mg/L (**Figure D-41**). A subtle increasing trend in chloride concentration began in 2009; and the wells all produce water with similar chloride concentrations.

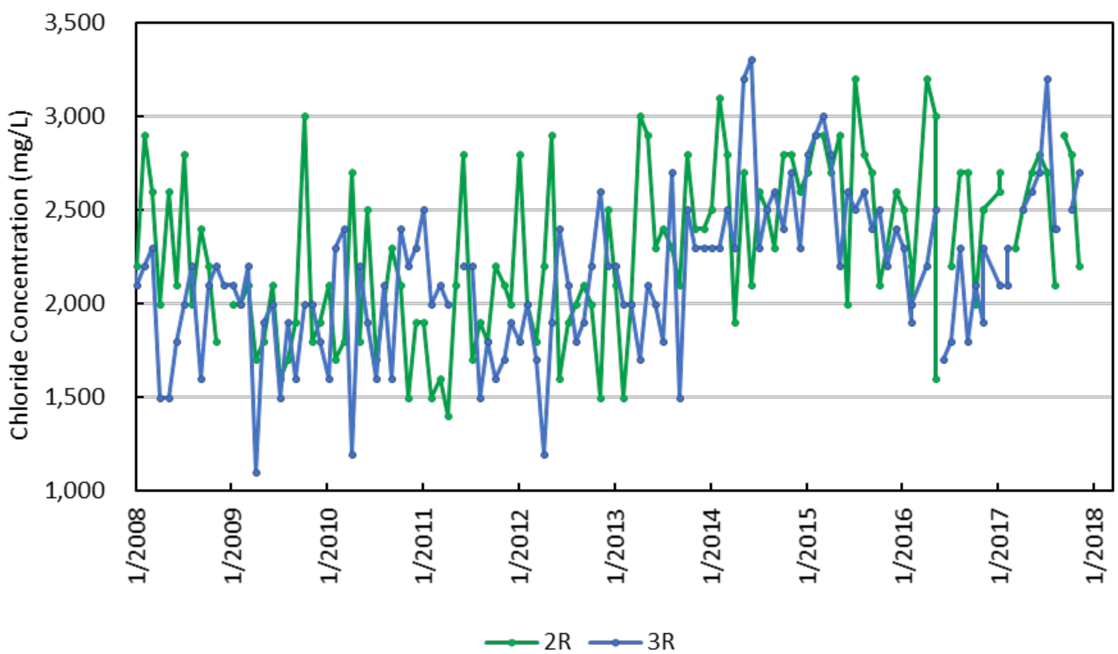

Figure D-41. Chloride concentrations in Village of Tequesta Floridan aquifer system (Avon Park Permeable Zone) wells 2R and 3R.

Town of Jupiter (50-00010-W)

The Town of Jupiter has relied on the FAS for a portion of its water supply since 1999. The Town operates 2 FAS well locations, the "eastern" and "western" wellfields, with a combined total of 13 wells. The eastern wellfield wells are completed from approximately 1,000 to 1,500 feet bls, obtaining approximately 20 percent of their water from the UFA and 80 percent from the APPZ, and they produce higher salinity water. The wells typically are pumped at rates of approximately 1,000 to 2,000 gpm, and in 2016, 11 active wells pumped 9.95 mgd. Wells in the western wellfield are completed between 1,400 to 1,600 feet bls, withdrawing from the APPZ only. A hydrogeologic cross-section depicting the well depth relationship between the eastern and western wellfields is shown in **Figure D-42**.

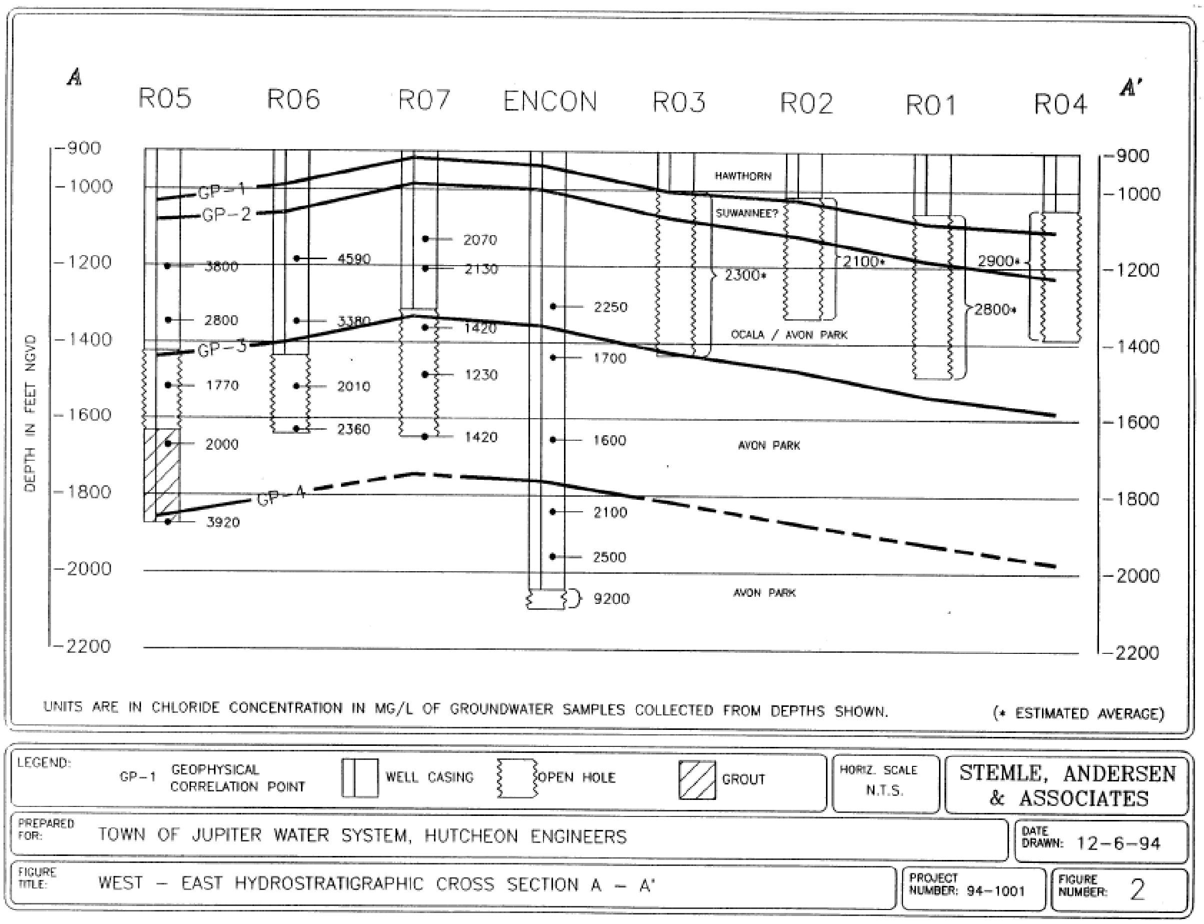

Figure D-42. Hydrogeologic cross-section of Town of Jupiter Floridan aquifer system wells RO1 to RO7 (From: Stemle, Andersen & Associates, Inc. 1994).

During the first several years of water production, the chloride concentration from the wells averaged approximately 3,000 mg/L (**Figure D-43**). In 2010, a second generation of wells were constructed to expand the FAS production capacity. Since then, the chloride concentration has shown greater variability among wells, and has increased to between 2,000 and 5,000 mg/L. Chloride concentrations in some wells have remained consistently low, whereas others show greater variability and have been increasing.

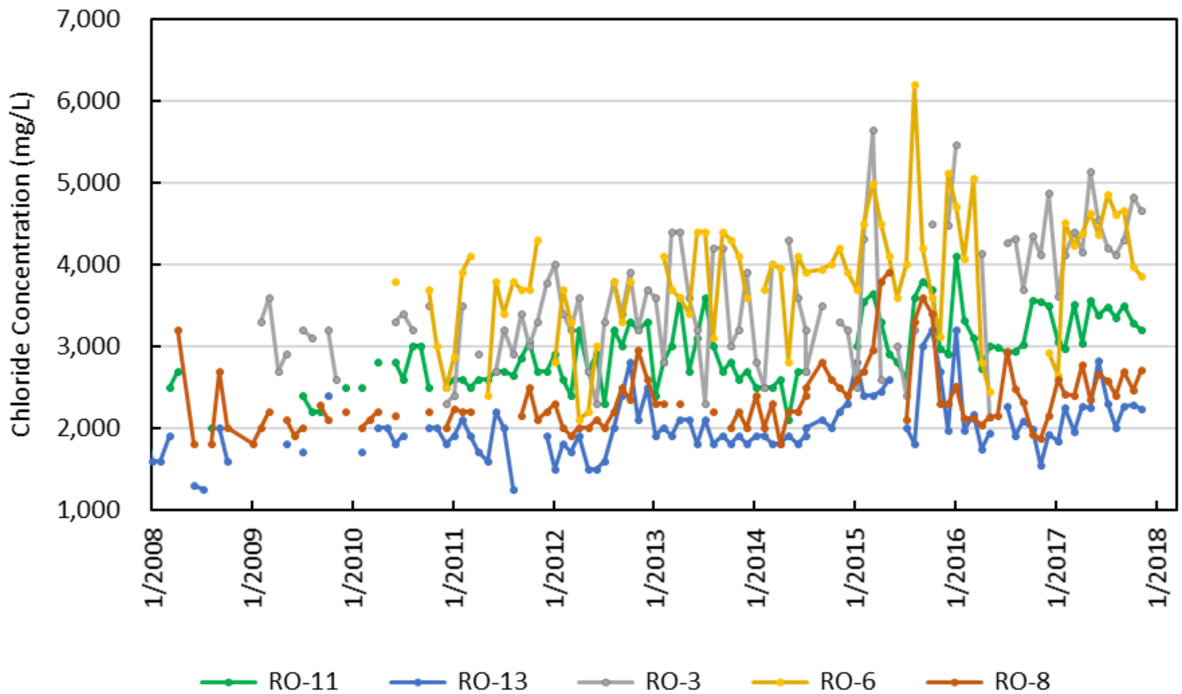

Figure D-43. Chloride concentrations in Town of Jupiter Floridan aquifer system wells RO-6 and RO-8 in the Avon Park Permeable Zone and wells RO-3, RO-11, and RO-13 in both the Upper Floridan aquifer and Avon Park Permeable Zone.

City of Lake Worth (50-00234-W)

The City of Lake Worth has used three FAS wells to supplement its water supply since 2011. The wells are completed in the APPZ to approximately 1,200 feet bls, with open holes to 1,500 feet bls. The wells are pumped at rates of approximately 1,500 gpm, and in 2016, the wells produced 3.08 mgd. Since the start of production, chloride concentrations in water from the three wells have remained between 2,000 and 2,400 mg/L (**Figure D-44**). Upon review of individual well withdrawals, changes in salinity appear related to pumping rates.

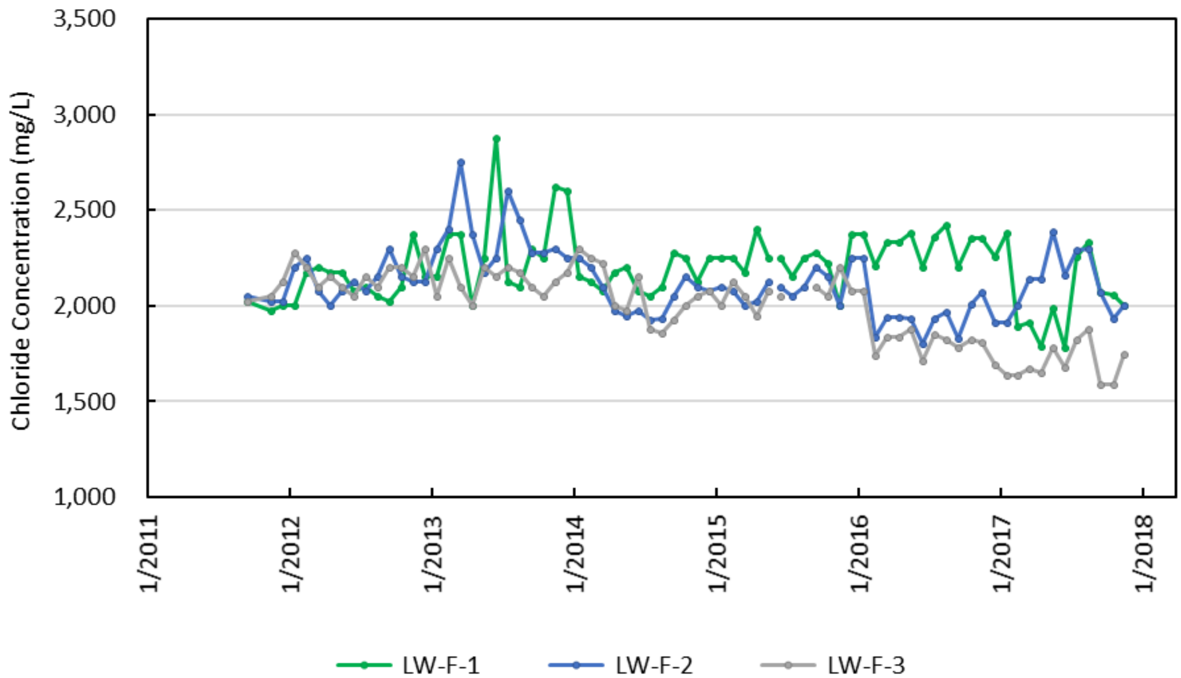

Figure D-44. Chloride concentrations in City of Lake Worth Floridan aquifer system (Avon Park Permeable Zone) wells LW-F-1, LW-F-2, and LW-F-3.

Town of Manalapan (50-00506-W)

The Town of Manalapan has used two FAS wells for water supply since 2012. One well is completed in the UFA to approximately 1,035 feet bls, with an open hole to 1,200 feet bls, and the other well is completed in the APPZ and open from 1,210 to 1,500 feet bls. The wells are pumped at rates of approximately 1,500 gpm, and in 2016, the wells produced 0.51 mgd. Since the start of production, the chloride concentration in water from one representative well has been between 2,000 and 3,000 mg/L (**Figure D-45**). Since 2015, chloride concentrations have stabilized between 2,000 and 2,500 mg/L.

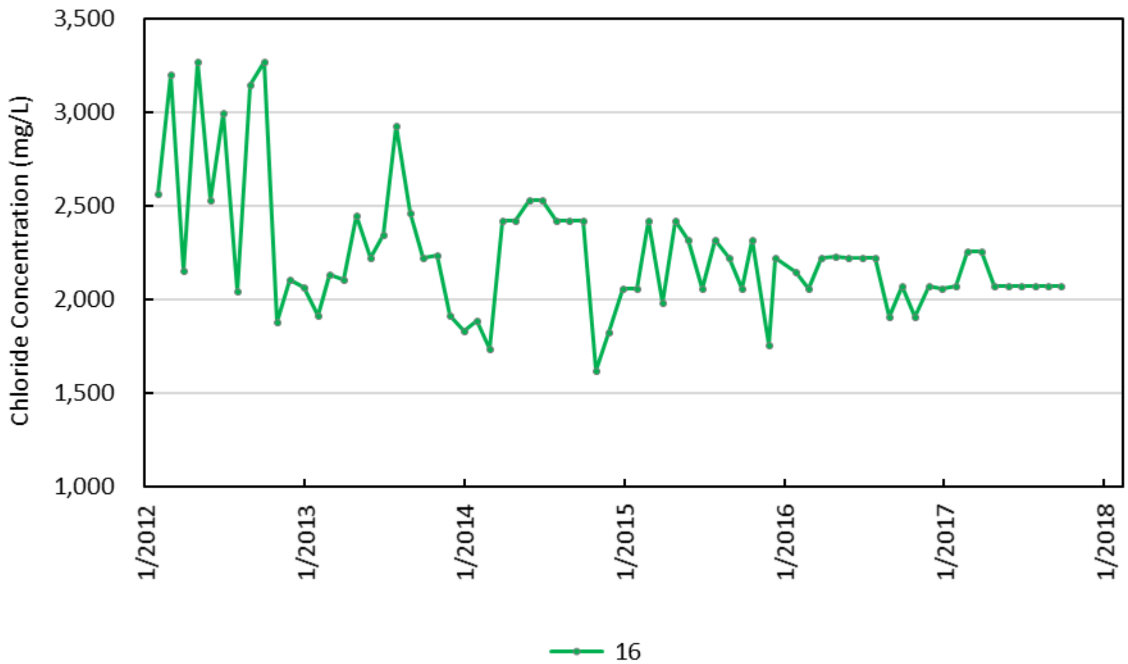

Figure D-45. Chloride concentrations in Town of Manalapan Floridan aquifer system (Avon Park Permeable Zone) well 6.

Glades Utility Authority, purchased by Palm Beach County Water Utilities Department in 2013, constructed a UFA wellfield in 2008. The wellfield originally consisted of seven wells completed to 1,150 feet bls, with open holes between 1,100 and 1,450 feet bls. The wells were pumped at rates of approximately 1,500 gpm per well, and in 2016, nine active wells produced a total of 6.67 mgd. During the first few years of wellfield operation, chloride concentrations increased dramatically from 1,600 to almost 5,000 mg/L in wells TP-1 and PW-6 (**Figure D-46**). Four additional wells were constructed between 2011 and 2015 to more efficiently manage the wellfield by lowering individual well pumpage rates, evenly distributing aquifer stress, and reducing the effects of interference between wells. Within 2 years, the chloride concentration in PW-6 decreased to 3,500 mg/L and has remained steady; however, the chloride concentration has continued to increase in TP-1, exceeding 6,000 mg/L. During construction of the remaining few wells, there were notable differences in the lithologies of the wells and highly variable vertical water quality stratification. Individual wells in this wellfield have shown a wide range of chloride concentrations, between 1,100 mg/L and 6,000 mg/L. Within this overall range, some wells have displayed increasing trends.

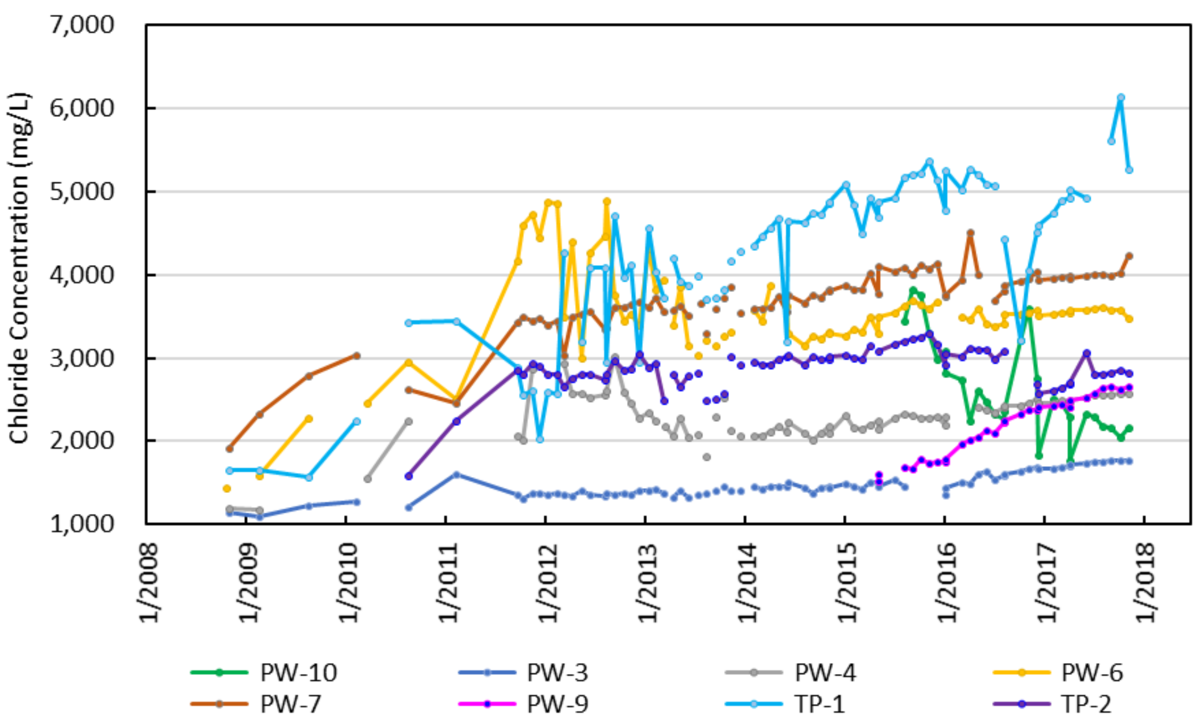

Figure D-46. Chloride concentrations in Palm Beach County Water Utilities Department – Western Region Floridan aquifer system (Upper Floridan aquifer) wells.

City of Sunrise (06-00120-W)

The City of Sunrise began using the FAS in 2011 with one UFA well (RO-1) at the Springtree wellfield. The well was completed to 1,110 feet bls, with an open hole to 1,270 feet bls. The well is pumped at a rate of approximately 1,400 gpm, and in 2016, it produced 1.16 mgd. The City has added three more FAS wells, two at the Sawgrass wellfield (SGF-1 and SGF-2) and one at the Melaleuca wellfield (MF-1). These wells were completed to 1,000 feet bls, with open holes between 1,000 and 1,200 feet bls. The three wells have not been put in operation but are sampled regularly for water quality. Water sampled from MF-1, withdrawing from the UFA, has the highest chloride concentration (5,000 mg/L; **Figure D-47**). The two Sawgrass wells, withdrawing 60 percent from the UFA and 40 percent from the APPZ, have exhibited chloride concentrations between 2,000 and 4,000 mg/L. Well RO-1 was an ASR well and the lower chloride concentrations from 2008 to 2015 reflect stored Biscayne aquifer water. Over time, that stored water has been removed and the water quality currently reflects typical FAS chloride concentrations.

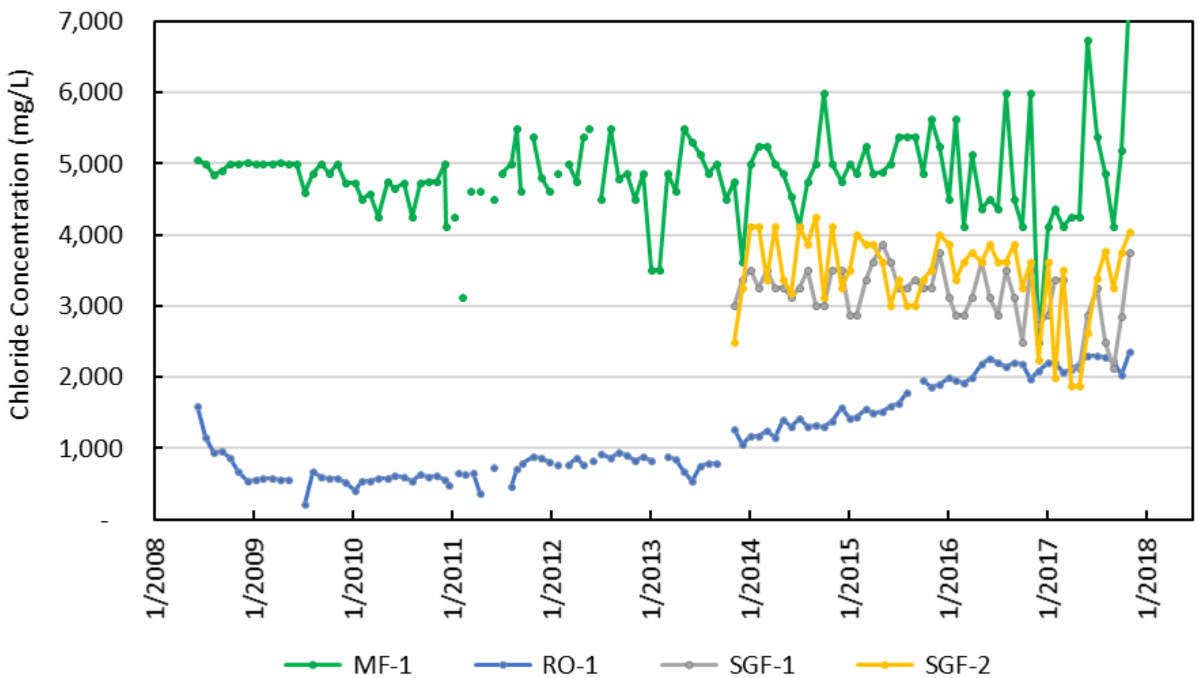

Figure D-47. Chloride concentrations in City of Sunrise Floridan aquifer system wells: MF-1 and RO-1 are completed in the Upper Floridan aquifer, while SGF-1 and SGF-2 are completed in the Upper Floridan aquifer/Avon Park Permeable Zone.

City of Hollywood (06-00038-W)

The City of Hollywood FAS wellfield has eight existing UFA wells completed to a depth of 926 feet bls with open holes to 1,300 feet bls. The first three wells came into production in 2007, and five wells were added between 2008 and 2010. The wells are pumped at rates of approximately 1,000 gpm, and in 2016, six active wells produced 3.85 mgd. The water quality produced by four representative wells over the past 10 years is shown in **Figure D-48**. Generally, water quality has remained between 1,800 and 2,500 mg/L. The current average chloride concentration of water produced from the wells is approximately 2,100 mg/L.

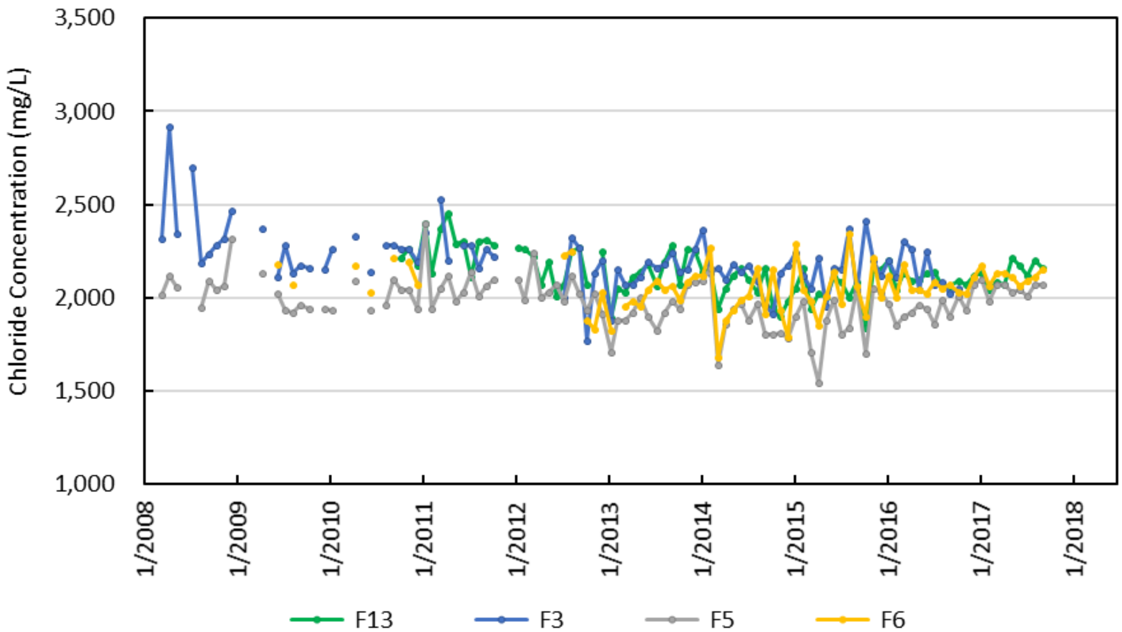

Figure D-48. Chloride concentrations in City of Hollywood Floridan aquifer system (Upper Floridan aquifer) wells 3, 5, 6, and 13.

Miami-Dade Water and Sewer Department (13-00017-W)

MDWASD began pumping from the Hialeah FAS wellfield in 2013. There are 10 existing UFA wells, completed to 1,100 feet bls with open holes to 1,490 feet bls. The wells are pumped at rates of approximately 1,400 gpm, and in 2016, six wells pumped a total of 9.07 mgd. The chloride concentration of water reported from the system has remained approximately 1,700 mg/L since pumping began, although it has varied between 1,300 to 1,900 mg/L (**Figure D-49**).

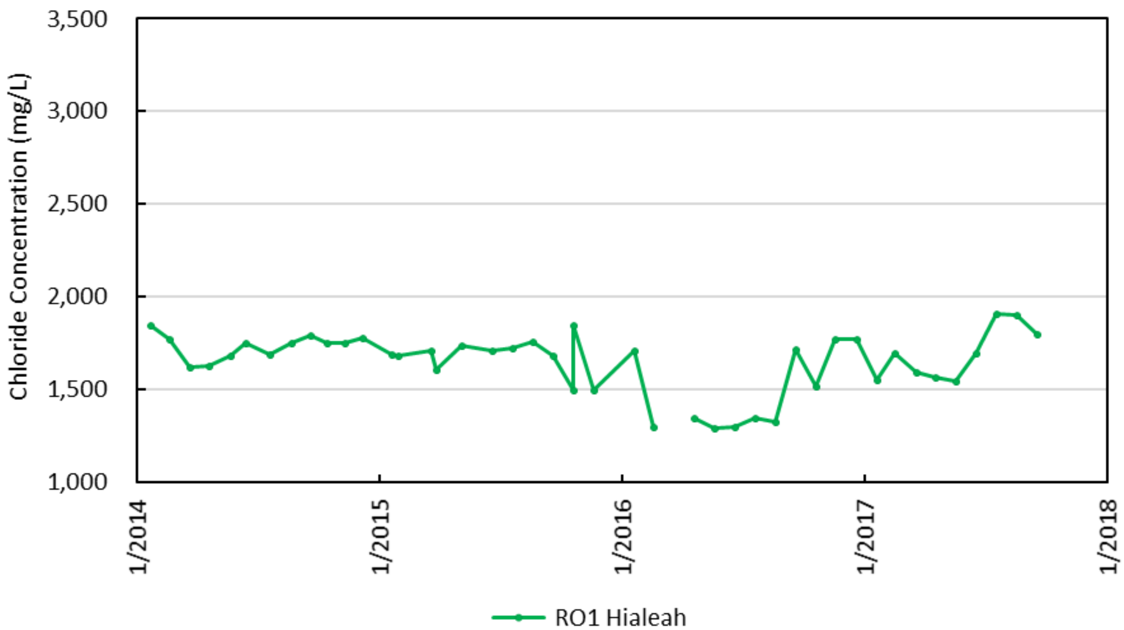

Figure D-49. Chloride concentrations in Miami-Dade Water and Sewer Department Floridan aquifer system (Upper Floridan aquifer) well RO1 Hialeah.

Florida Keys Aqueduct Authority (13-00005-W)

The Florida Keys Aqueduct Authority obtains FAS water from four wells constructed at the J. Robert Dean Water Treatment Plant in Florida City, which is treated with RO and blended with water from the Biscayne aquifer. The FAS wellfield has been producing water since 2011. The FAS wells are completed in the UFA between 880 and 1,350 feet bls. The wells have pump capacities of approximately 2,000 gpm, with actual pumpage of 0.53 mgd in 2016. The chloride concentrations have remained stable, between 2,200 and 2,800 mg/L, since 2016 (**Figure D-50**).

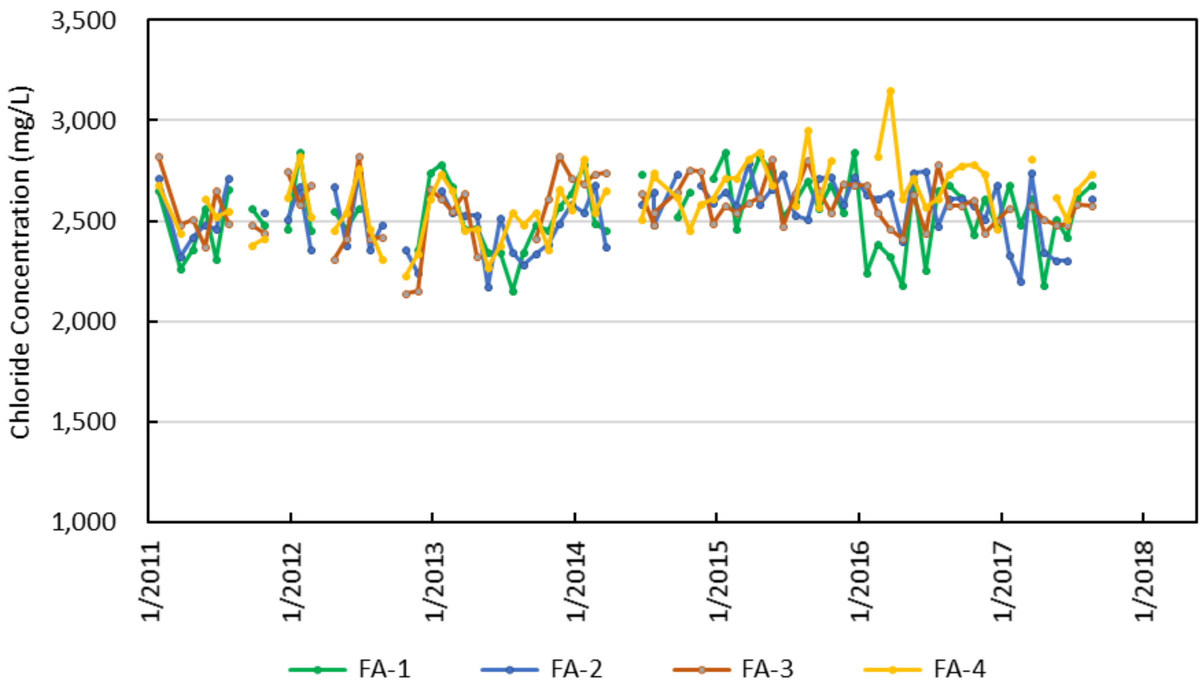

Figure D-50. Chloride concentrations in Florida Keys Aqueduct Authority Floridan aquifer system (Upper Floridan aquifer) wells FA-1 to FA-4.

SFWMD Groundwater Models

The SFWMD has developed two models for the LEC Planning Area: the Lower East Coast Subregional (LECsR) Model and the East Coast Floridan Model (ECFM; **Figure D-51**). The Lower East Coast Subregional Model has been used to analyze the Loxahatchee River Watershed Restoration Project and the C-51 Reservoir project (**Chapter 6**). The ECFM was used in the *2016 Upper East Coast Water Supply Plan Update* and in this 2018 LEC Plan Update; the LEC results are discussed here.

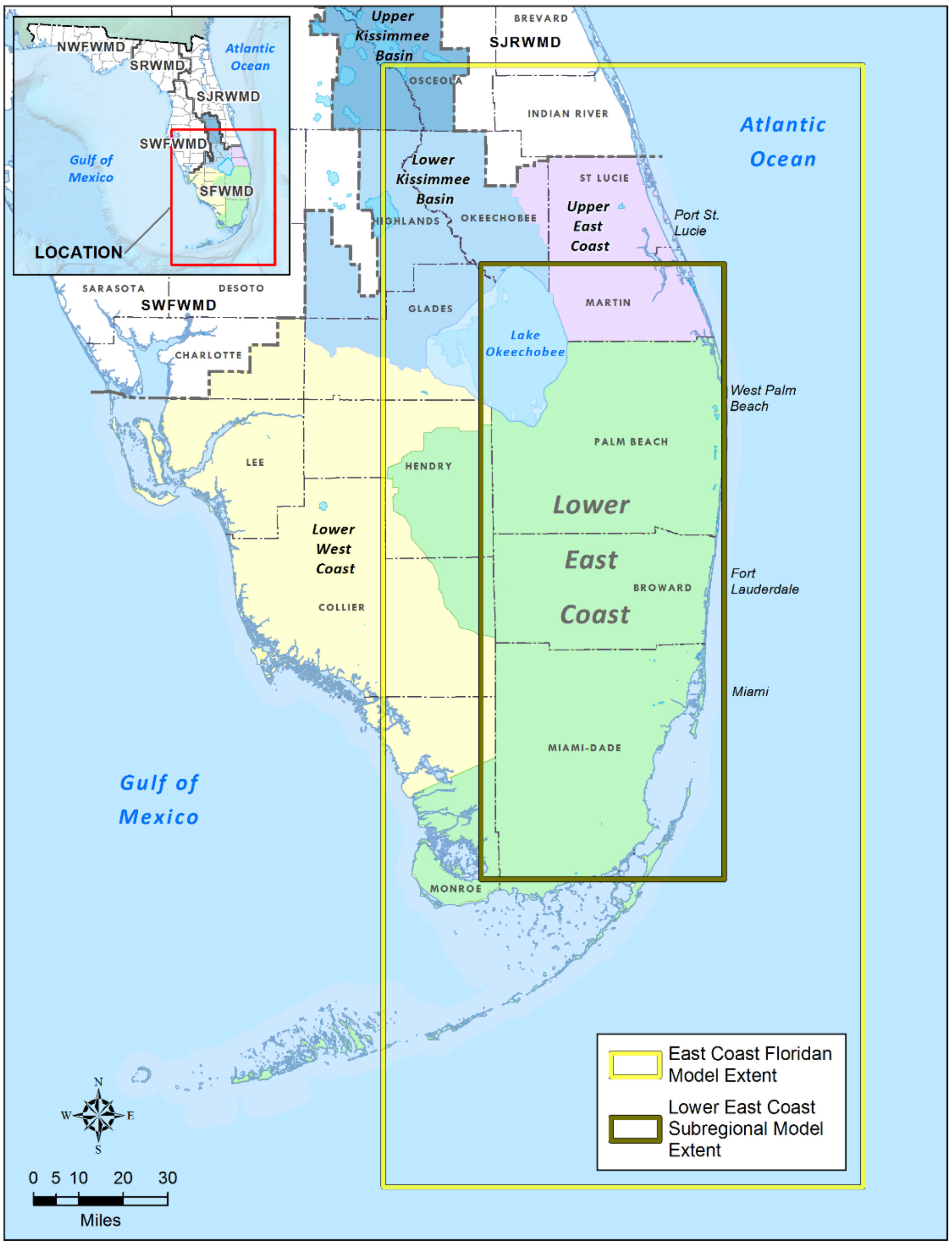

Figure D-51. Model boundaries for the Lower East Coast Subregional Model and the East Coast Floridan Model.

East Coast Floridan Model

The ECFM is a density-dependent groundwater flow and solute transport model of the FAS covering the Upper East Coast and LEC planning areas of the SFWMD. An independent peer review of the model was conducted in 2011, suggested changes were made, and the model was calibrated with data through early 2013. The ECFM simulates regional groundwater levels, flows, and quality changes (TDS) in the FAS in response to withdrawals. The model was designed with seven layers (**Figure D-52**), from the UFA (Layer 1) to the Boulder Zone (Layer 7), with model cells that are 2,400 feet by 2,400 feet in size. The UFA and APPZ are the two layers used as water supply sources in the LEC Planning Area. The ECFM does not simulate surface water or the SAS. A comprehensive description of the ECFM is available in Giddings et al. (2014).

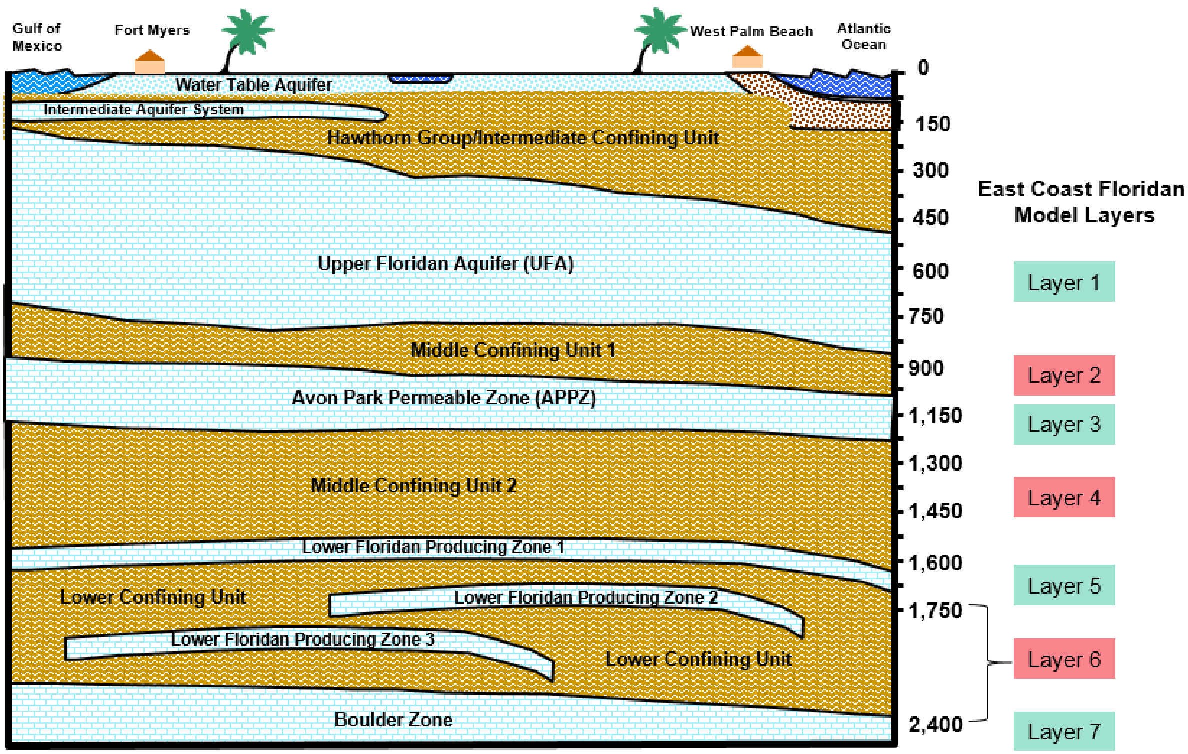

Figure D-52. East Coast Floridan Model layers.

Analysis

The ECFM was developed for regional water supply planning purposes and uses the best available data on aquifer characteristics and water quality. Water use data included the locations of existing wells and reported, estimated, or projected use. For future wells, location information came from permittees. The model utilizes TDS as the primary component for tracking changes in water quality; chlorides generally make up approximately 50 percent of TDS in water from the FAS.

Model Setup

For each permitted FAS user, pumping volumes and wellfield locations were inputs to the ECFM for 2016 and 2040 simulations. The model simulated 2016 withdrawals from actual reported pumpage data, and 2040 withdrawals were obtained from the estimated demands identified in this 2018 LEC Plan Update. General descriptions of the pumping volumes and locations used in the model are as follows:

- For PWS utilities, estimates of FAS withdrawals were based on actual withdrawal data from utilities, with consideration given to water use permits (e.g., available allocation, wellfield operations, proposed wellfields) and discussions with utility staff.
- Irrigation demands were derived from historical use records. For 2040, the irrigation demands for each user reflect average pumpage for the period of record, which ranged from 8 to 15 years.
- For power generation facilities in Palm Beach County, 3 to 4 years of pumpage data were used to estimate the 2040 demand.
- Permitted allocations were used for the FPL Turkey Point Plant remedial program and the aquaculture operation in Miami-Dade County in the 2040 simulation because they were not operating by 2016.
- Existing well locations were determined using information in water use permits. For proposed wells not yet permitted, information was provided by PWS utilities.
- Actual well withdrawals were used for the 2016 simulation. For the 2040 simulation, total demand for each user usually was distributed evenly among the user's existing and proposed wells. Historical use patterns were considered, along with wells removed from service or minimally used, when distributing demands.
- If distributing 2040 demands to all of a user's permitted wells resulted in less than 0.50 mgd per well, not all wells were used. Increased demands were distributed among existing wells if additional wells were not listed in the water use permit or provided by the PWS utility.
- Many PWS utilities have implemented specific wellfield operation strategies to manage water quality changes, including rotating wells, reducing withdrawals, and resting wells for longer periods of time. Because of the regional nature of the ECFM, the model's monthly time increments, and utility-specific operations, these strategies were not included.

Simulations

Two 24-year simulations were conducted using the ECFM. The first simulation analyzed the potential impacts of 24 years of pumping the 2016 FAS volumes; this is referred to as the "2016 Model Run" in the model results figures. A second simulation, using the future (2040) demands, evaluated the potential impacts of pumping the 2040 FAS volumes for 24 years. This is referred to as the "2040 Model Run." Both simulations started with the same water level (potentiometric surface elevations) and TDS data values. The starting data were extracted from the final month of the calibration period (December 2012) of the ECFM calibration run. Water levels and TDS concentrations in month 12 of the simulation were used to compare the initial condition to the ending condition. In addition, the ending water levels, TDS concentrations, and flow properties of the two model runs were compared to each other to identify changes in water levels, water quality, and flows. A summary of the water demands used in the two runs is provided in **Table D-6**.

Table D-6. LEC Planning Area East Coast Floridan Model run demands.

Water Use Category	Simulated Average Floridan Aquifer System Withdrawals (mgd)	
	2016	2040
Recreation/Landscaping Irrigation	2.09	2.72
Aquaculture	0.00	15.34
Power Generation	10.19	23.51
Public Water Supply	52.56	104.41
Total	**64.84**	**145.98**

mgd = million gallons per day.

Results

Initial water levels for the 2016 simulation (month 12), water level changes between 2016 and 2040, and water levels at the end of the model simulations are shown in **Figures D-53** to **D-55** for the UFA and in **Figures D-56** to **D-58** for the APPZ. **Table D-7** describes the range of values of the model results within the LEC Planning Area and identifies users in the areas where the lowest water levels or highest TDS concentrations occur.

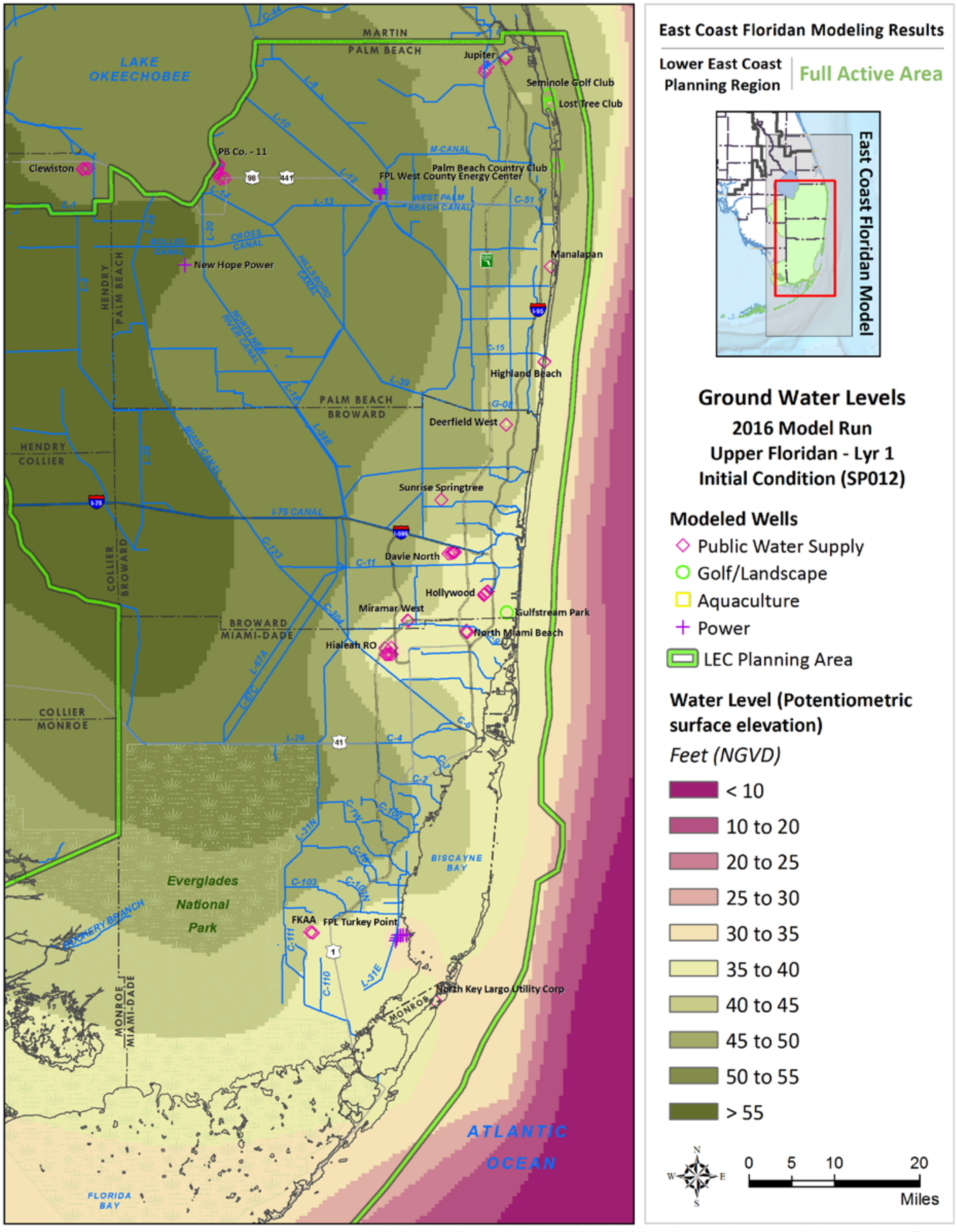

Figure D-53. Initial water levels in 2016 in the Upper Floridan aquifer (Layer 1).

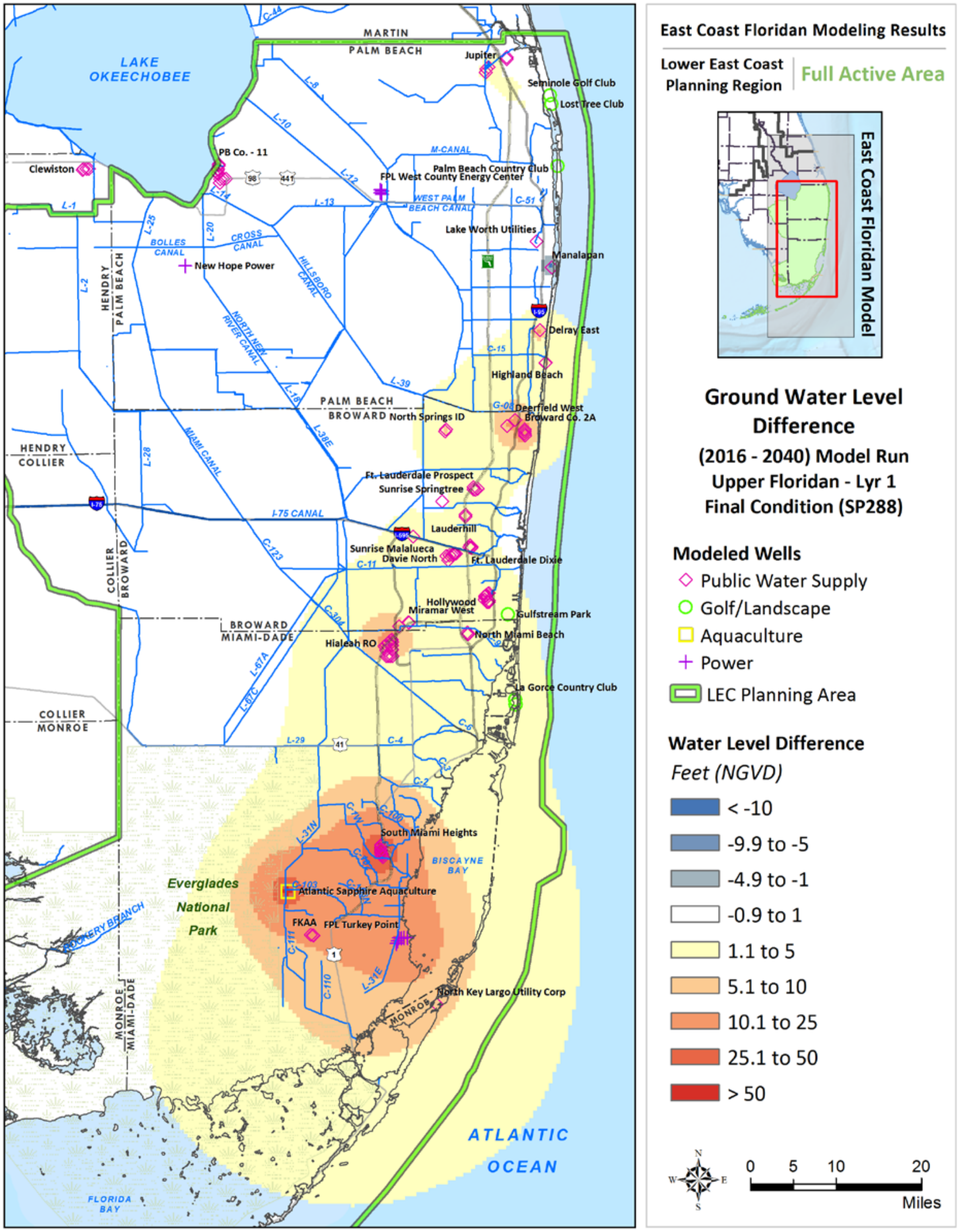

Figure D-54. Water level changes between the 2016 and 2040 runs at the end of the modeling period (month 288) in the Upper Floridan aquifer (Layer 1).

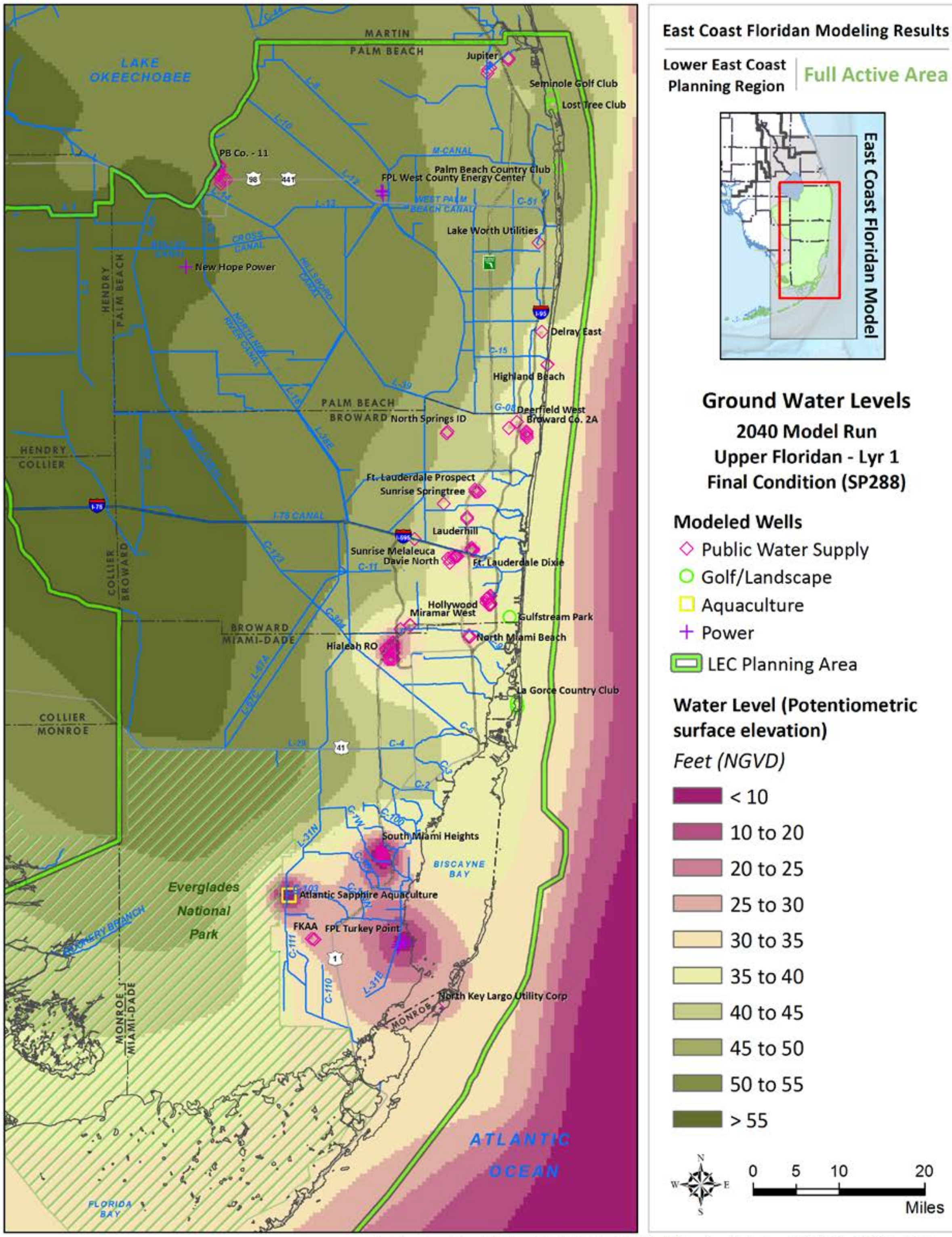

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Figure D-55. Final water levels in 2040 in the Upper Floridan aquifer (Layer 1).

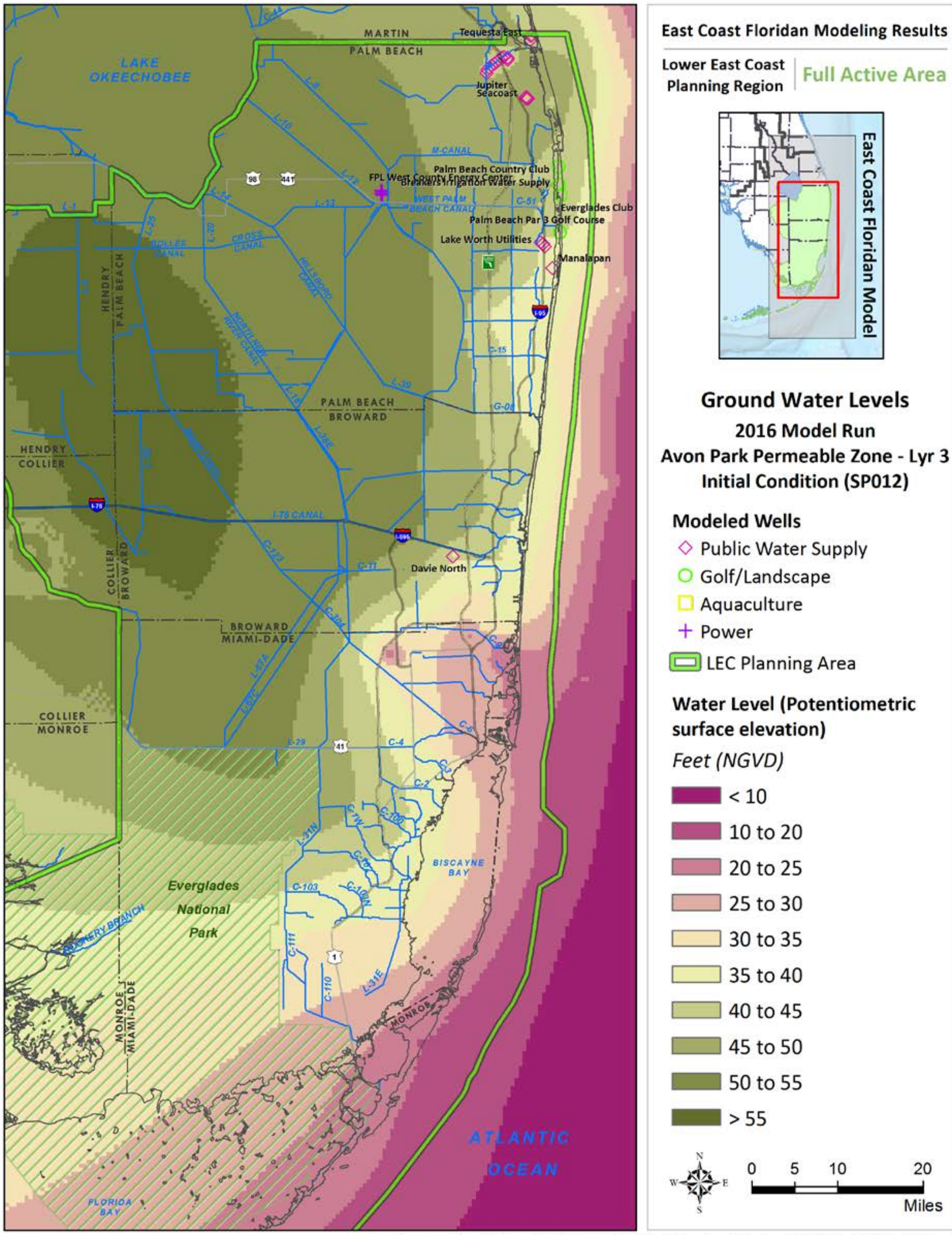

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Figure D-56. Initial water levels in 2016 in the Avon Park Permeable Zone (Layer 3).

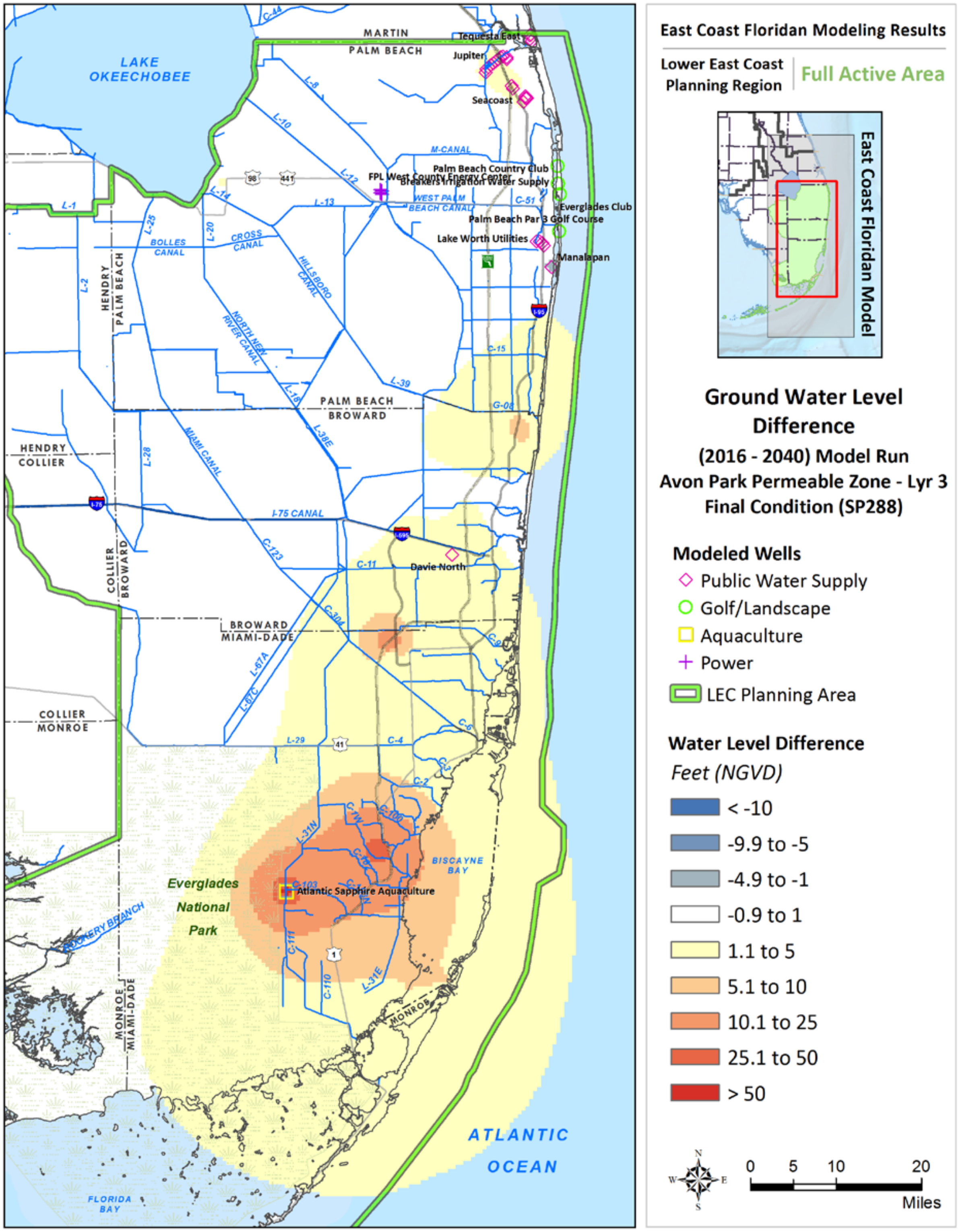

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Figure D-57. Water level changes between the 2016 and 2040 runs at end of the modeling period (month 288) in the Avon Park Permeable Zone (Layer 3).

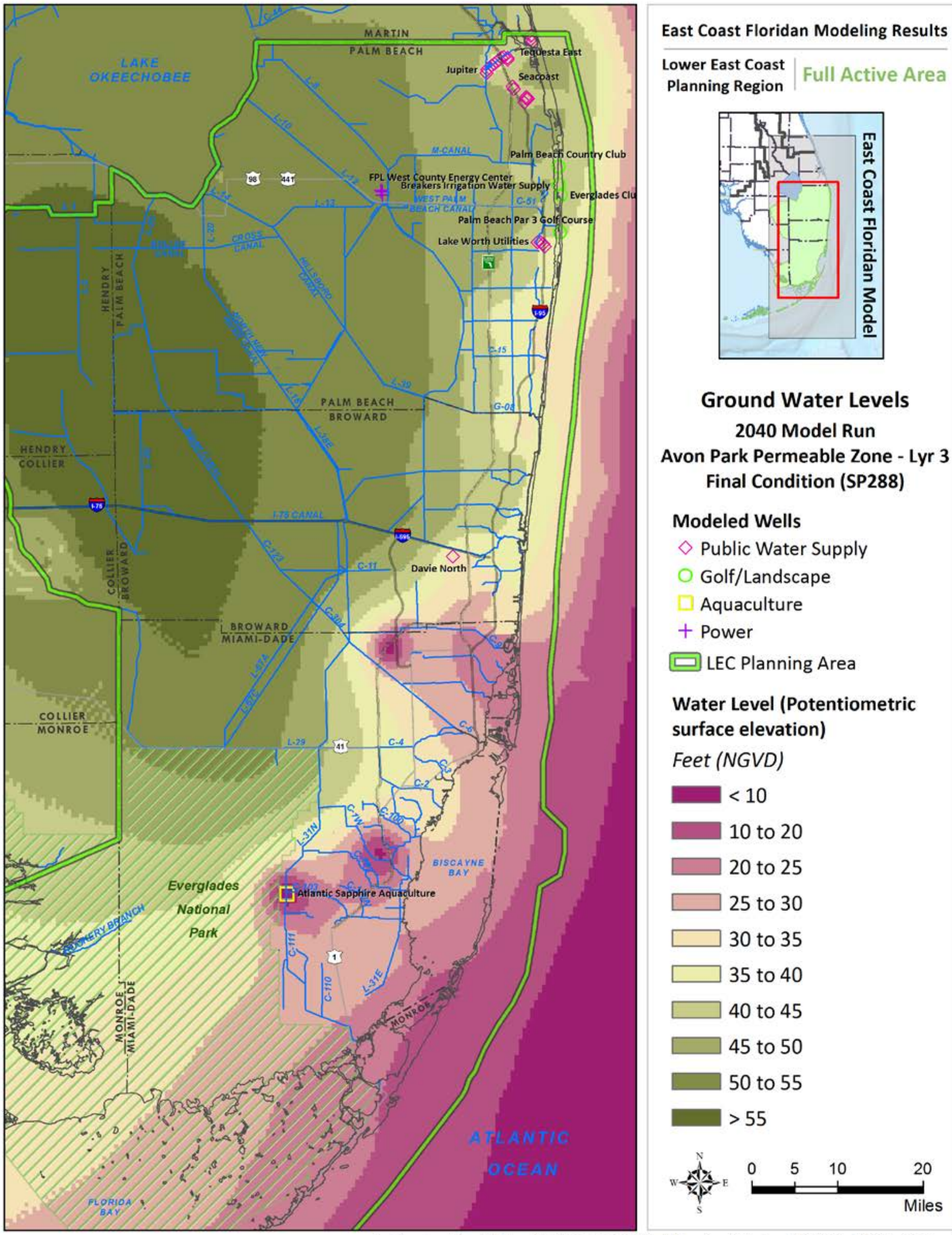

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Figure D-58. Final water levels in 2040 in the Avon Park Permeable Zone (Layer 3).

Table D-7. Model result summary for water levels and total dissolved solids.

Parameter	Upper Floridan Aquifer			Avon Park Permeable Zone		
	Range of Values[a]	Value	Affected Users	Range of Values[a]	Value	Affected Users
2016						
Water Level (feet NGVD29)	24 to 58	<30	Miramar FPL Turkey Point	25 to 58	<30	Miramar[b] Hialeah[b] North Miami Beach[b]
Total Dissolved Solids (mg/L)	1,700 to 8,300	>7,000	Highland Beach Sunrise Lauderhill Fort Lauderdale	1,500 to 18,500	>15,000	Miramar[b] North Miami Beach[b]
2040						
Water Level (feet NGVD29)	-36 to 58	<0	South Miami Heights Atlantic Sapphire FPL Turkey Point	-70 to 58	<0	Atlantic Sapphire
Total Dissolved Solids (mg/L)	1,700 to 8,300	>7,000	Highland Beach Sunrise Lauderhill Fort Lauderdale North Key Largo	1,500 to 20,000	>16,000	North Miami Beach[b] Atlantic Sapphire
2016 to 2040 Change						
Water Level Decline (feet)	-12[c] to 83	>60	Atlantic Sapphire South Miami Heights	-1.5[c] to 110	>60	Atlantic Sapphire
Total Dissolved Solids Increase (mg/L)	-750[c] to 2,900	>1,000	Hialeah South Miami Heights FPL Turkey Point	-500[c] to 8,900	>2,000	Tequesta Seacoast Deerfield[b] Atlantic Sapphire

FPL = Florida Power & Light; mg/L = milligrams per liter; NGVD29 = National Geodetic Vertical Datum of 1929.
[a] Values from selected cells in the vicinity of well withdrawals and model calibration points.
[b] Utilities not pumping from the Avon Park Permeable Zone.
[c] Indicates water level and TDS improvements at location where withdrawals ceased.

Model results of predicted water quality are shown in **Figures D-59** to **D-62** for the UFA and the APPZ. Water quality at the end of the 2040 simulation (month 288) is shown for the UFA in **Figure D-59**, and the change in water quality in the UFA between the initial condition and the end of the 2040 simulation is shown in **Figure D-60**. Water quality in the APPZ at the end of the 2040 simulation (month 288) is shown in **Figure D-61**, and the change in water quality in the APPZ between the initial condition and the end of the 2040 simulation is shown in **Figure D-62**.

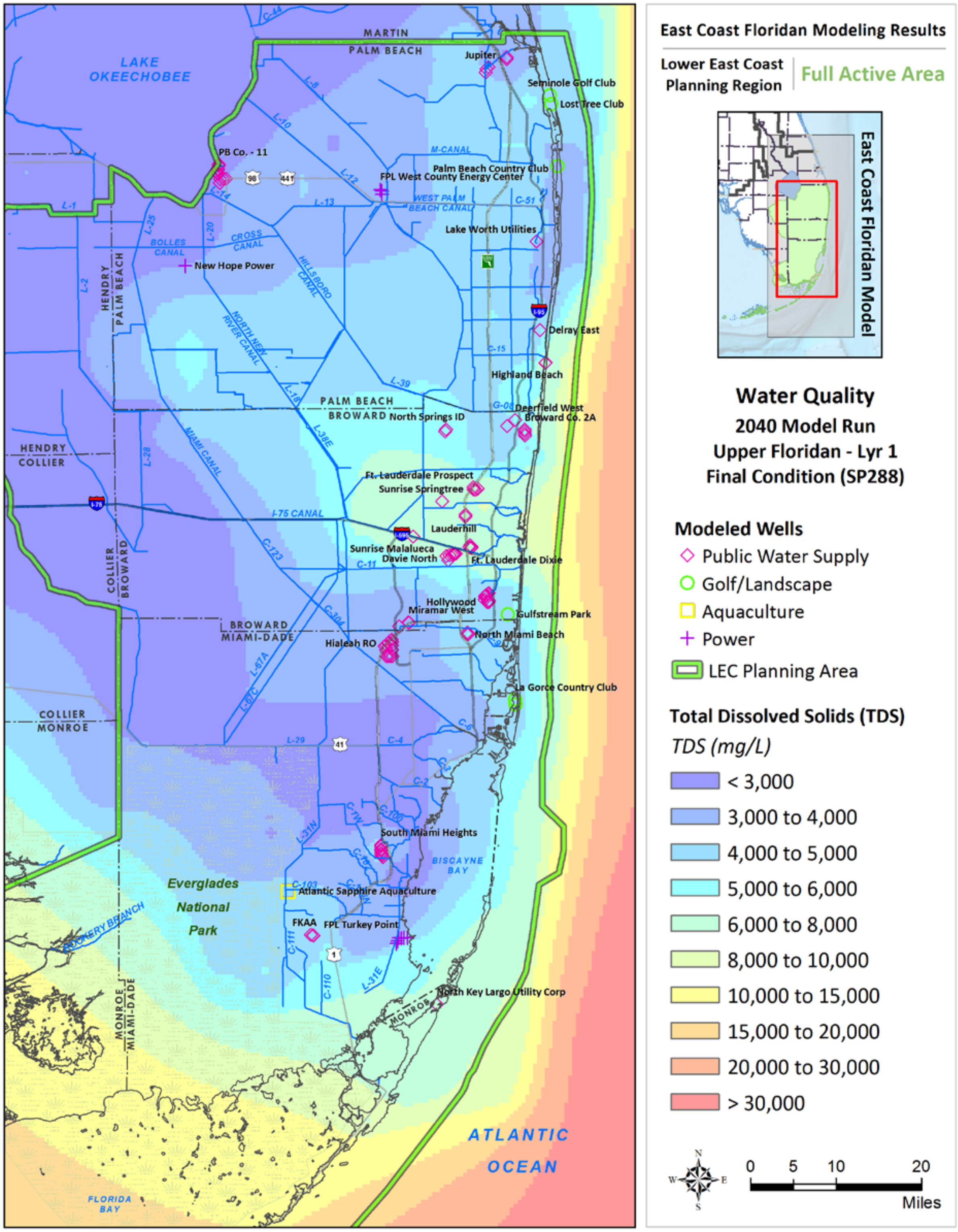

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Figure D-59. Water quality (total dissolved solids) at the end of the modeling period (month 288) using 2040 demand projections in the Upper Floridan aquifer (Layer 1).

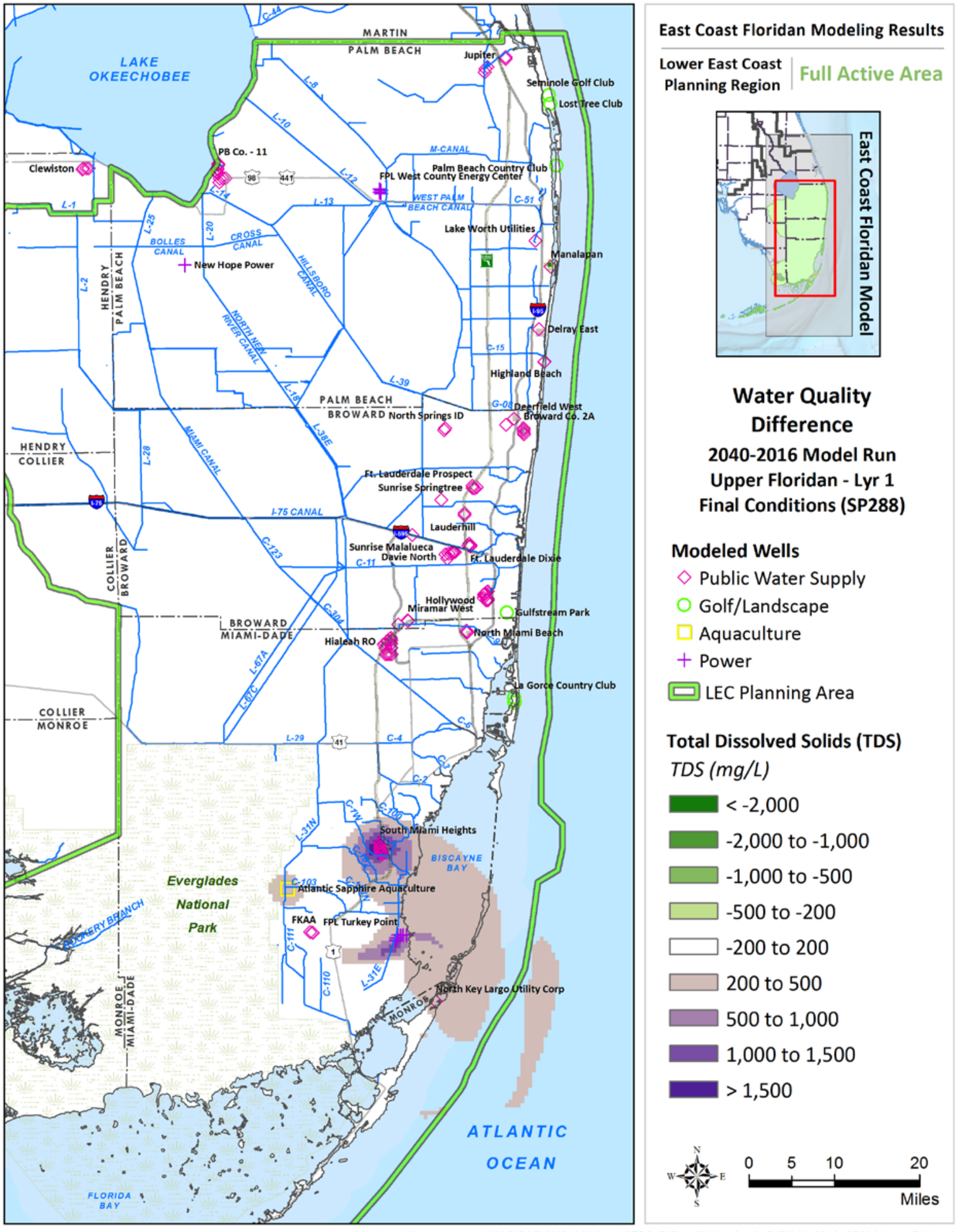

Figure D-60. Water quality (total dissolved solids) changes between the 2016 run and the 2040 run at the end of the modeling period (month 288) in the Upper Floridan aquifer (Layer 1).

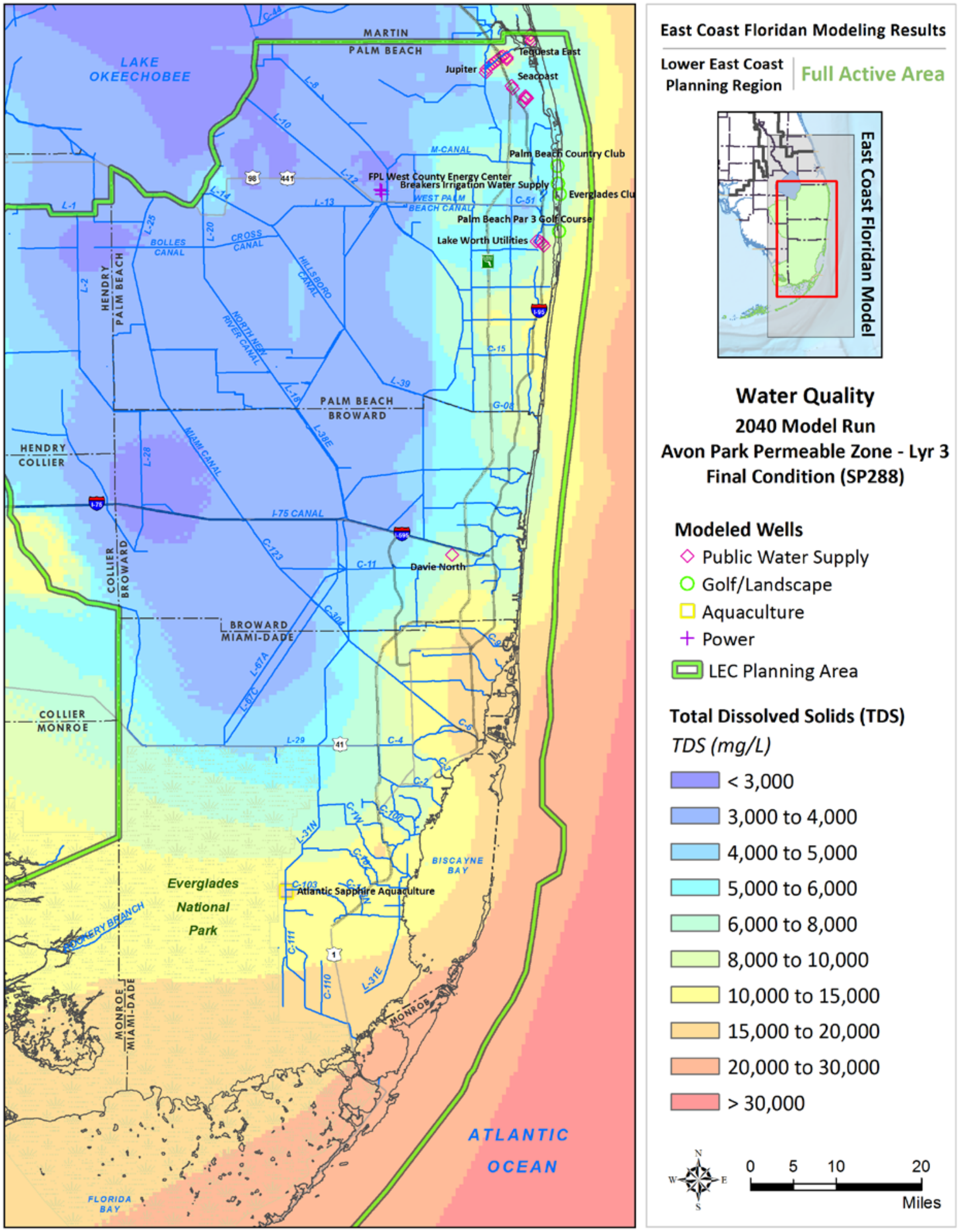

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Figure D-61. Water quality (total dissolved solids) at the end of the modeling period (month 288) using 2040 demand projections in the Avon Park Permeable Zone (Layer 3).

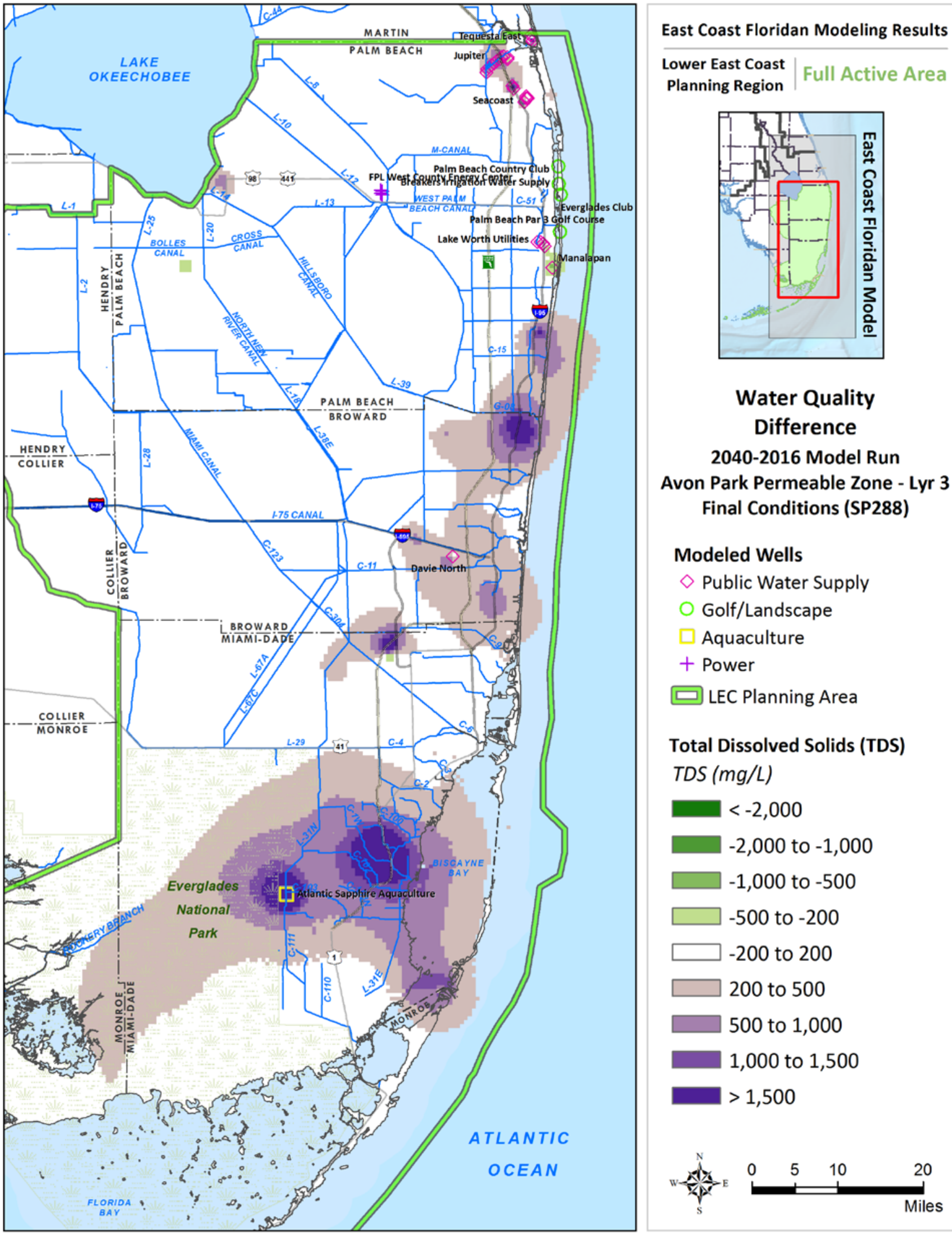

Figure D-62. Water quality (total dissolved solids) difference between the 2016 run and the 2040 run at the end of the modeling period (month 288) in the Avon Park Permeable Zone (Layer 3).

Modeling graphics and results, including individual well hydrographs and other regional results, can be found in Billah (2018). Horizontal and vertical flow data are used to determine where well withdrawals are originating in the aquifer. Horizontal flow vectors identify if water is coming in from offshore and determine the zone of influence. **Figure D-63** is a horizontal flow vector map for the Upper Floridan aquifer when pumping 2040 demands.

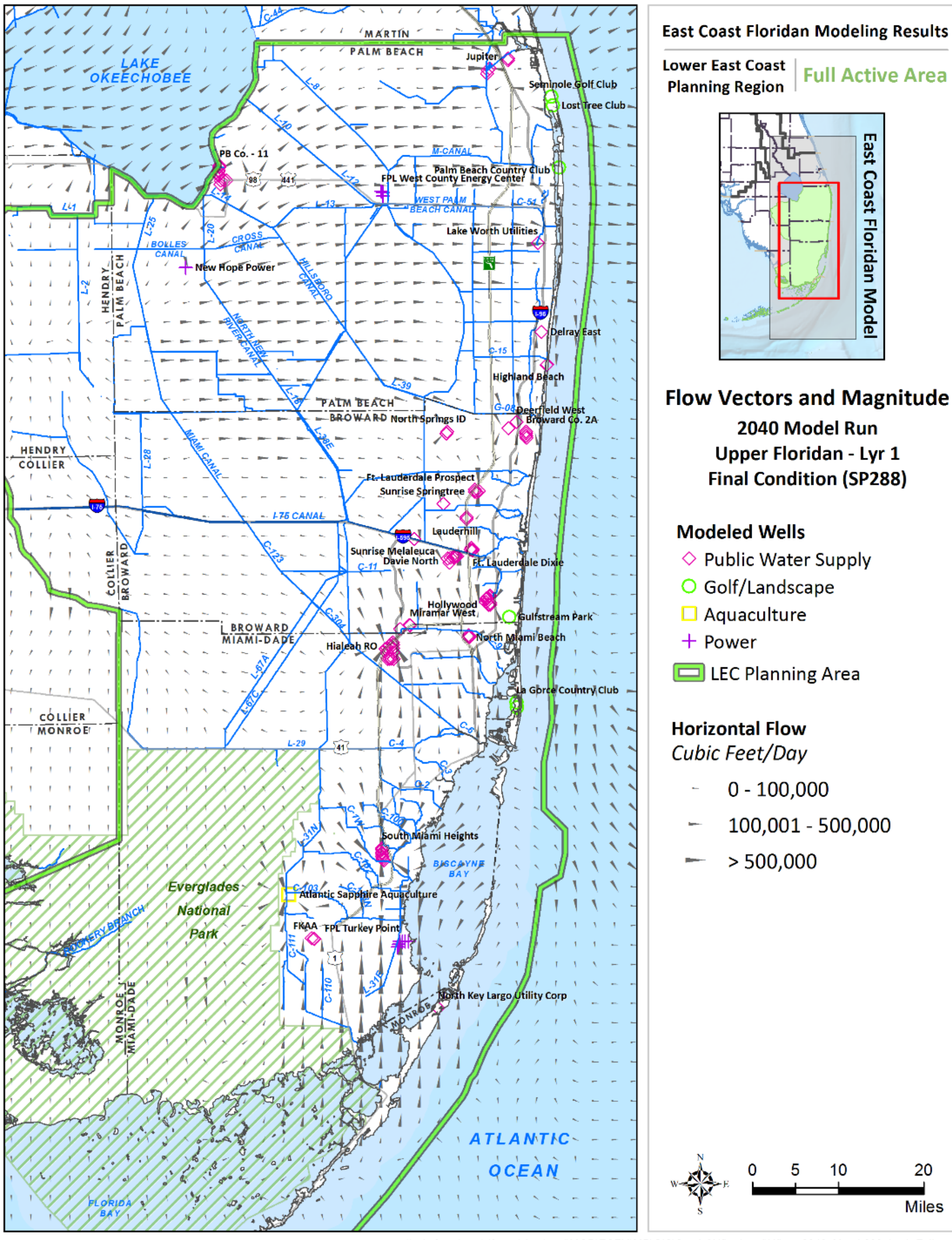

Figure D-63. Horizontal flow magnitude and direction at the end of the modeling period (month 288) using 2040 demand projections in the Upper Floridan aquifer (Layer 1).

Vertical flow volumes indicate the degree of upconing from deeper aquifers or contributions from overlying aquifers. **Figures D-64** and **D-65** illustrate vertical flow volumes entering the bottom of the UFA and APPZ respectively at the end of the 2040 simulation.

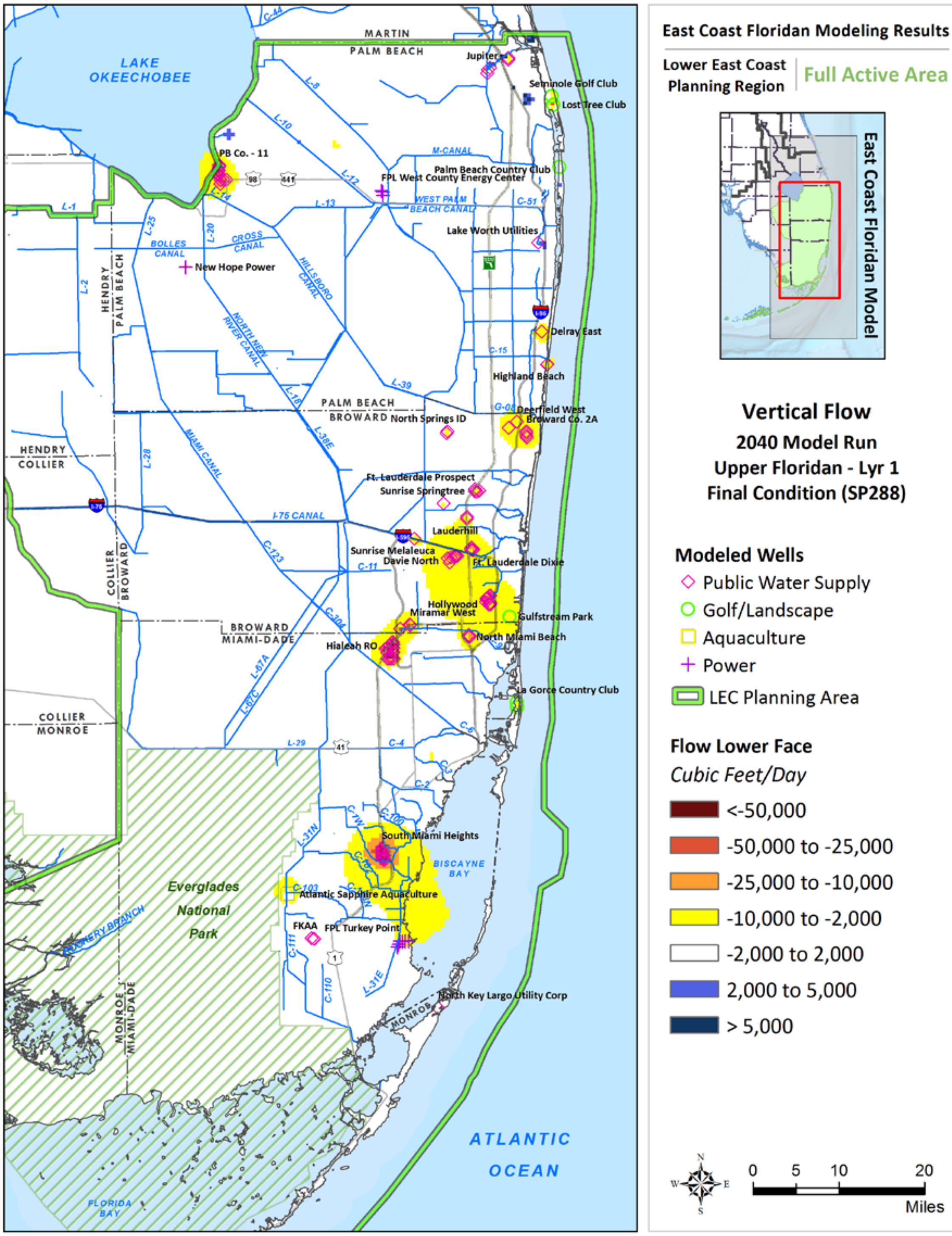

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Figure D-64. Vertical flow into the base of the Upper Floridan aquifer (Layer 1) at the end of the 2040 modeling period (month 288).

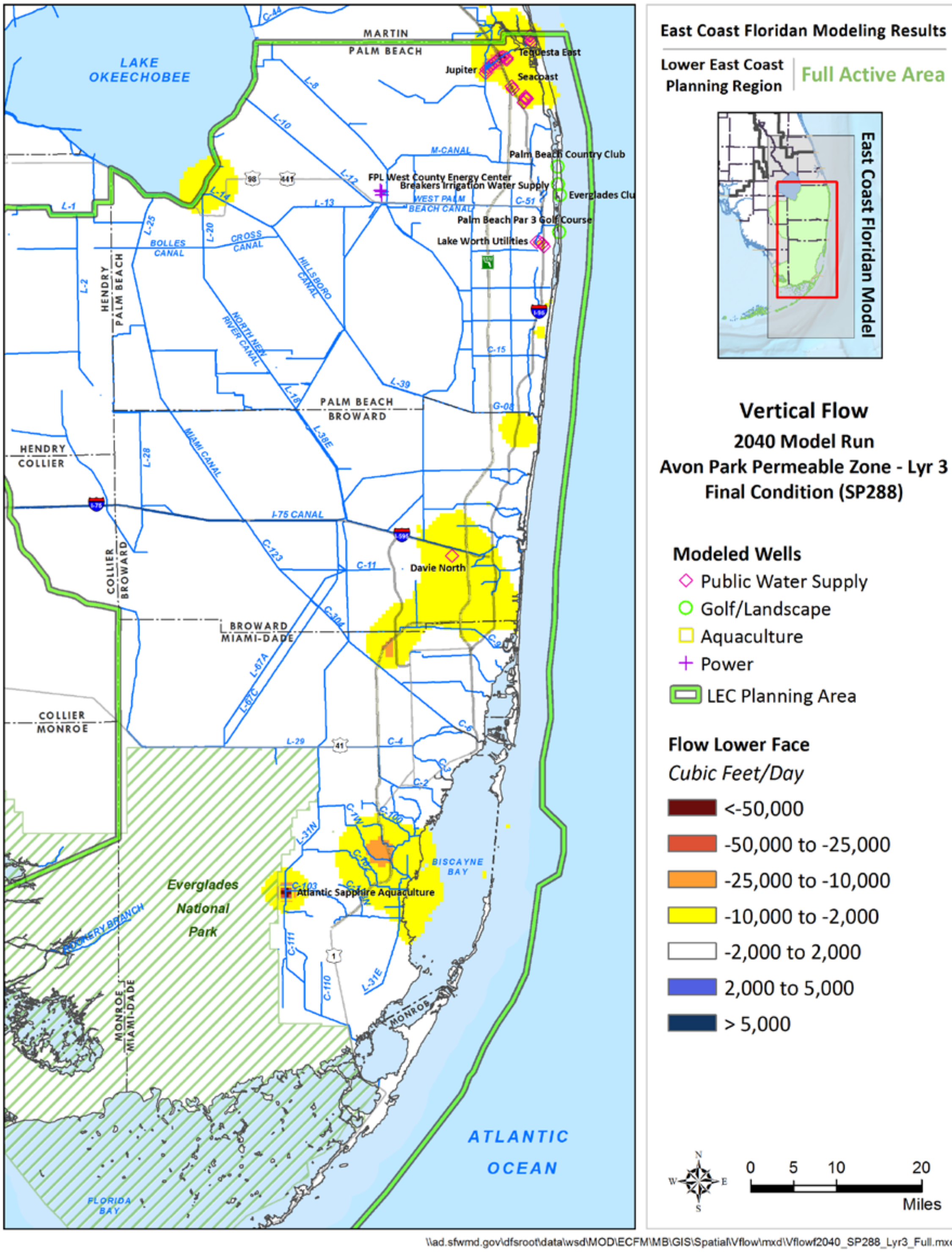

Figure D-65. Vertical flow into the base of the Avon Park Permeable Zone (Layer 3) at the end of the 2040 modeling period (month 288).

Additional flow maps and an evaluation of changes in horizontal and vertical flow direction and magnitude within a single aquifer layer or between aquifers through the confining units are discussed in the model analysis documentation (Billah 2018).

Analysis of Results

The ECFM results presented here must be considered in the proper context. First, these are planning-level evaluations. Second, the model is regional in nature, extending from central Florida to the Florida Keys, with a model cell size of 2,400 feet by 2,400 feet. There are several instances where multiple existing or proposed wells were in the same model cell, which may have resulted in larger drawdowns and TDS increases than actually would be experienced. Third, the model simulates the 2016 and 2040 demands for a 24-year period, but demands normally would increase gradually over time; therefore, the simulations herein are conservative in nature. Fourth, the regional nature of the model limits the ability to account for specific wellfield operations used by utilities to mitigate water quality degradation observed at individual wells. For these reasons, the model results should be used as indicators for where potential problems could be experienced if no wellfield design or operations plan is implemented to minimize movement of poor-quality water. Despite these limitations, the ECFM results indicate 2040 demands can be met using the FAS.

Analysis of the model results indicate the following:

- Increased withdrawals at projected future rates (2040) will result in drawdowns in the UFA and APPZ, with drawdowns in the APPZ being of greater concern. Changes in the APPZ are from direct withdrawals (approximately one-quarter of the total FAS withdrawals simulated) and withdrawals from the overlying UFA. Stages in the APPZ decline near some UFA withdrawals, suggesting upward movement of poor-quality water. The degree of confinement between the UFA and APPZ is relatively low, and the model results reflect this through the observed drawdowns and water quality changes.
- The largest differences in water level between the 2016 and 2040 simulations in the UFA are observed in Miami-Dade County at three locations: an aquaculture site, the MDWASD South Miami Heights wellfield, and the FPL Turkey Point Plant (**Figure D-54**). Water levels (potentiometric surface elevations) are predicted to be below land surface at the end of the 2040 simulation at these locations, with pumpage of 15, 23, and 22 mgd, respectively.
- In the UFA, using 2016 demands, the highest simulated TDS concentrations are approximately 8,000 mg/L and occur in central Broward County. Simulating the 2040 demands resulted in minimal further water quality degradation. The only areas with notable increases in TDS in the UFA were at the MDWASD Hialeah (1,200 mg/L) and South Miami Heights (2,900 mg/L) wellfields (**Figure D-59**).
- There is minimal change in water quality or water levels in the UFA for most of the model domain through 2040. Some water quality degradation occurs, but much of the change is less than 1,500 mg/L over 24 years. Water quality changes in the UFA between the 2016 and 2040 demands are shown in **Figure D-60**.
- In the APPZ, TDS concentrations are predicted to be highest in southern Miami-Dade County (10,000 to 15,000 mg/L). Also, the aquaculture operation APPZ withdrawal (10 mgd) increased TDS to almost 20,000 mg/L by 2040; however, the higher values are within the range needed for the facility's operations. Some water quality degradation is predicted to continue for PWS utilities withdrawing from the APPZ in northern Palm Beach County. Water quality changes in the APPZ between the 2016 and 2040 simulations are shown in **Figure D-62**.

- In the APPZ, water levels generally declined less than 6 feet in the 2040 simulation. However, the MDWASD Hialeah and South Miami Heights wellfields showed water level drops between 11 and 16 feet. The largest decline, exceeding 100 feet, was at the aquaculture operation. Water level changes in the APPZ between the 2016 and 2040 simulations are shown in **Figure D-57**.
- The areas with the largest water quality changes in the UFA and APPZ (**Figures D-60** and **D-62**) also are the areas with the largest withdrawals and water level declines, which results in upconing of poor-quality water from underlying aquifer layers.

Conclusions

Review of historical chloride data and the ECFM results concluded that properly designed and managed FAS wellfields appear able to meet projected demands through 2040 in the LEC Planning Area. The planning-level ECFM simulations and analyses conducted to support this plan update are considered conservative and provide insight to potential water level and water quality changes that may occur in the FAS over time if no wellfield design and operations plan is implemented to minimize movement of poor-quality water. The model results identified potential issues that may require further evaluation. The FAS will continue to provide a substantial and increasing portion of the water needed to meet projected 2040 demands. Water quality should remain adequate for all users with RO treatment, as needed.

Several FAS wellfields in the LEC Planning Area have experienced some water quality degradation, but current operations have shown this can be managed by PWS utilities through appropriate wellfield design and operating protocols, including the following activities:

- Increasing well spacing (more than 1,000 feet) to minimize interference effects and to reduce stress on the FAS.
- Rotating the operation of individual wells, thereby reducing overall pumping stress on the well's production zone.
- Plugging and abandoning individual wells experiencing increases in chloride concentration and replacing them with new wells elsewhere within the wellfield area.
- Reducing pumping rates at individual wells to minimize water level declines, which increase the potential for poor-quality water to enter the well's production zone from below.
- Installing monitor wells to provide early warning of the need for changes to wellfield operations to minimize upconing or lateral movement of poor-quality water.

Next Steps

Potential issues that require further evaluation, as well as some of the assumptions used in the ECFM, should continue to be assessed through a coordinated effort with PWS utilities, power generation utilities, and other stakeholders.

The following suggestions are provided to guide future efforts to ensure long-term sustainability of the FAS:

- Coordinate with PWS utilities to facilitate long-term management of the FAS.
- Increase the sustainability of the FAS through appropriate wellfield design and operations (e.g., additional wells with greater spacing between them, reduced pumping from each well to minimize upconing of poor-quality water).
- Reduce the capacity of APPZ wells to minimize upconing of poor-quality water.
- Continue to refine wellfield operational plans and communicate these refinements to the SFWMD for incorporation into future ECFM efforts.
- Incorporate additional well construction, aquifer test, lithologic, and other data from FAS monitor wells, FAS water supply wells, and deep injection wells into the ECFM. Users are encouraged to coordinate FAS drilling and testing programs with SFWMD staff prior to drilling to maximize collection of mutually beneficial data. Packer testing results from confining layers would enhance the ECFM's representations of confining layers.
- Coordinate with FAS users and SFWMD staff regarding evaluation of the effects of water quality degradation on the viability of the FAS for existing legal users, including water quality thresholds for membrane treatment processes, treatment costs, clarification of impact criteria, monitoring guidelines, the potential for conflicts with other regulatory programs, and if warranted, regulatory strategies to maintain the viability of the FAS as a water supply source.

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E

Public Water Supply Utility Summaries

This appendix provides summaries of the Public Water Supply (PWS) utilities that provide 0.10 million or greater gallons per day (mgd) of net (finished) potable water for the Lower East Coast (LEC) Planning Area (**Table E-1**). For this *2018 Lower East Coast Water Supply Plan Update* (2018 LEC Plan Update), South Florida Water Management District (SFWMD) staff updated the utility summaries from the 2013 LEC Plan Update with data from the Florida Department of Environmental Protection (FDEP 2017) and the SFWMD's water use regulatory database. In addition, the proposed water supply projects were updated based on utility reports provided to the SFWMD in November 2017 and through direct communication with utilities between 2016 and 2018. To help explain the information in the utility summaries, a sample profile with descriptions is provided. The utility summaries are ordered alphabetically by county for easy navigation. **Figures E-1** to **E-3** show the locations of the PWS wellfields for Palm Beach, Broward, and Miami-Dade counties, respectively, and precede each county's utility summaries. Potential future water conservation savings are addressed in **Chapter 3** and not included in the utility summaries herein.

INFO ⓘ

Acronyms

ASR – aquifer storage and recovery

BCWWS – Broward County Water and Wastewater Services

BCWWS-SRW – Broward County Water and Wastewater Services South Regional Wellfield

FAS – Floridan aquifer system

FKAA – Florida Keys Aqueduct Authority

FPL – Florida Power & Light

MDWASD – Miami-Dade Water and Sewer Department

PBCWUD – Palm Beach County Water Utilities Department

RO – reverse osmosis

SAS – surficial aquifer system

WTP – water treatment plant

Table E-1. Summary of the public water supply utilities with a capacity of 0.10 mgd or greater in the LEC Planning Area.

Supply Entity/Facility	SFWMD Permit Number	Gross (Raw) Water (mgd)			FDEP PWS ID	Rated Net (Finished) Capacity (mgd)
		Annual Allocation	SAS	FAS		
Palm Beach County						
Boca Raton, City of	50-00367-W	51.54	51.54	0.00	4500130	70.00
Boynton Beach, City of	50-00499-W	20.86	16.58	6.42	4500145	29.64
Delray Beach Water and Sewer Department, City of	50-00177-W	19.10	19.10	1.50	4500351	26.00
Golf, Village of	50-00612-W	0.69	0.69	0.00	4501528	0.86
Highland Beach, Town of	50-00346-W	3.15	0.00	3.15	4500609	3.00
Jupiter, Town of	50-00010-W	24.41	18.80	11.71	4501491	30.00
Lake Worth Utilities, City of	50-00234-W	11.25	5.25	6.00	4500773	17.40
Lantana, Town of	50-00575-W	2.48	2.48	0.00	4500784	3.84
Manalapan, Town of	50-00506-W	1.92	0.58	1.34	4500840	2.35
Mangonia Park, Town of	50-00030-W	0.58	0.58	0.00	4500841	1.08
Maralago Cay	50-01283-W	0.27	0.27	0.00	4500062	0.42
Palm Beach County Water Utilities Department	50-00135-W	86.99	79.99	7.00	4504393	103.28
Palm Beach County Water Utilities Department Western Region	50-06857-W	9.43	0.00	9.43	4505005	10.00
Palm Springs, Village of	50-00036-W	4.62	4.62	0.00	4501058	10.00
Riviera Beach, City of	50-00460-W	9.08	9.08	0.00	4501229	17.50
Seacoast Utility Authority	50-00365-W	26.92	22.30	8.90	4501124	30.50
Tequesta, Village of	50-00046-W	4.37	1.10	3.43	4501438	6.33
Wellington Public Utilities Department	50-00464-W	8.02	8.02	0.00	4500014	12.80
West Palm Beach Public Utilities, City of [a]	50-00615-W	41.20[a]	41.20	0.00	4501559	47.00
Palm Beach County Total		**326.88**	**282.18**	**58.88**		**422.00**
Broward County						
Broward County WWS District 1	06-00146-W	13.90	10.04	3.86	4060167	16.00
Broward County WWS District 2A/North Regional Wellfield	06-01634-W	22.06	17.50	4.60	4060163	40.00
Broward County WWS South Regional Wellfield[b]	06-01474-W	15.64	15.64	0.00	N/A[b]	N/A[b]
Cooper City Utility Department, City of	06-00365-W	4.55	4.55	0.00	4060282	7.00
Coral Springs, City of	06-00102-W	9.44	9.44	0.00	4060290	16.00
Coral Springs Improvement District	06-00100-W	5.42	5.42	0.00	4060291	7.40
Dania Beach, City of	06-00187-W	1.10	1.10	0.00	4060253	5.02
Davie, Town of	06-00134-W	19.85	5.02	14.83	4060344	10.00
Deerfield Beach, City of	06-00082-W	14.74	11.91	4.00	4060254	23.60
Fort Lauderdale, City of	06-00123-W	61.19	52.55	8.64	4060486	90.00
Hallandale Beach, City of	06-00138-W	4.03	4.03	0.00	4060573	16.00
Hillsboro Beach, Town of	06-00101-W	0.88	0.88	0.00	4060615	2.25
Hollywood, City of	06-00038-W	39.38	24.80	8.68	4060642	59.50
Lauderhill, City of	06-00129-W	8.72	7.70	1.02	4060787	16.00
Margate, City of	06-00121-W	9.30	9.30	0.00	4060845	13.50
Miramar, City of	06-00054-W	18.87	15.15	3.15	4060925	17.75
North Lauderdale, City of	06-00004-W	3.65	3.65	0.00	4060976	7.50
North Springs Improvement District	06-00274-W	5.18	5.18	0.00	4064390	6.80
Parkland Utilities, Inc.	06-00242-W	0.35	0.35	0.00	4061957	0.58

Supply Entity/Facility	SFWMD Permit Number	Gross (Raw) Water (mgd)			FDEP PWS ID	Rated Net (Finished) Capacity (mgd)
		Annual Allocation	SAS	FAS		
Pembroke Pines, City of	06-00135-W	15.60	15.60	0.00	4061083	18.00
Plantation, City of	06-00103-W	17.24	17.24	0.00	4061121	24.00
Pompano Beach, City of	06-00070-W	17.75	17.75	0.00	4061129	50.00
Royal Utility Corporation	06-00003-W	0.48	0.48	0.00	4061517	1.00
Seminole Tribe of Florida – Hollywood[c]	N/A[c]	0.53	0.53	0.00	N/A[c]	N/A[c]
Sunrise, City of	06-00120-W	40.07	29.09	10.98	4061408[d]	51.50
Tamarac, City of	06-00071-W	7.58	7.58	0.00	4061429	16.00
Tindall Hammock Irrigation and Soil Conservation District	06-00170-W	0.74	0.74	0.00	4060419	1.00
Broward County Total		**358.24**	**293.22**	**60.60**		**516.40**
Miami-Dade County						
Americana Village	13-02004-W	0.26	0.26	0.00	4131403	0.50
Florida City Water and Sewer Department	13-00029-W	2.08	2.08	0.00	4130255	4.00
Homestead, City of	13-00046-W	10.55	10.55	0.00	4130645	19.20
Miami-Dade Water and Sewer Department	13-00017-W	386.07	349.50	36.60	4130871[e]	461.43
North Miami, City of	13-00059-W	17.27	9.30	7.97	4130977	9.30
North Miami Beach, City of	13-00060-W	38.38	26.31	12.07	4131618	32.00
Miami-Dade County Total		**454.61**	**398.00**	**56.64**		**526.43**
Monroe County						
Florida Keys Aqueduct Authority[f]	13-00005-W	23.97	17.79	9.70	4134357	29.80
Monroe County Total		**23.97**	**17.79**	**9.70**		**29.80**
Hendry County						
Seminole Tribe of Florida – Big Cypress[c]	N/A[c]	2.00	2.00	0.00	N/A[c]	N/A[c]
Hendry County Total		**2.00**	**2.00**	**0.00**		
LEC Planning Area Total		**1,165.70**	**993.19**	**185.82**		**1,494.63**

FAS = Floridan aquifer system; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; N/A = not applicable; PWS ID = Public Water Supply identification number; SAS = surficial aquifer system; SFWMD = South Florida Water Management District; WWS = Water and Wastewater Services.

[a] Withdrawal source is surface water from Clear Lake.

[b] Does not treat water, provides raw water to City of Hollywood for treatment before delivery to Broward County District 3, which serves a population but does not have a wellfield or water treatment plant and thus does not have a permit or FDEP water treatment ID.

[c] Allocation was established in the Water Rights Compact not through an SFWMD water use permit, and there is no FDEP water treatment ID for the Seminole Tribe of Florida.

[d] This system has two FDEP PWS IDs: 4061408 and 4061410.

[e] This system has two permit numbers: 4130871 and 4131202.

[f] Withdrawals located in Miami-Dade County.

SAMPLE UTILITY COMPANY

Service Area: Sample city and portions of unincorporated county

Description: This description includes water sources, type of WTPs, and other issues of concern to the utility.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	100,000	110,000	120,000	130,000
Average 2012-2016 Per Capita (gallons per day finished water)	100			
Potable Water Demands (daily average annual finished water in mgd)	**10.00**	**11.00**	**12.00**	**13.00**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 12-34567-W (expires 2040)			
SAS	14.00			
FAS	2.00			
Total Allocation	**16.00**			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID# 1234567)				
Permitted Capacity by Source	Existing	Projected		
	2016	2020	2030	2040
SAS	18.00	18.00	18.00	18.00
FAS	0.00	2.00	3.00	3.00
Total Potable Capacity	**18.00**	**20.00**	**21.00**	**21.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	1.00	1.00	4.00	4.00
ASR	2.00	2.00	3.00	3.00
Total Nonpotable Capacity	3.00	3.00	7.00	7.00

Projects Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
2.00-mgd expansion of FAS RO treatment plant	FAS	2019	$14.00	2.00	2.00	2.00
FAS wells and expansion of RO treatment plant	FAS	2029	$4.00	0.00	1.00	1.00
Total Potable Water			**$18.00**	**2.00**	**3.00**	**3.00**
Nonpotable Water						
3.00-mgd reclaimed water facility	Reclaimed Water	2021	$5.00	0.00	3.00	3.00
ASR and irrigation supply	ASR	2022	$2.00	0.00	1.00	1.00
Total Nonpotable Water			**$7.00**	**0.00**	**4.00**	**4.00**
Total New Water			**$25.00**	**2.00**	**7.00**	**7.00**

1 **Population** – The 2016 populations were determined by assigning 2010 United States Census block data and permanent resident population data published in 2017 by the Bureau of Economic and Business Research to 2016 PWS utility service areas. The 2020 and 2030 population projections were linear interpolations from the 2016 data. To project 2040 populations, the relative growth rates for PWS utility service areas were developed using county population projections (see **Appendix B** for more information).

2 **Average 2012-2016 Per Capita** (gallons per day finished water) – A PWS utility's per capita was calculated by dividing total net (finished) water produced each year (from monthly operating reports submitted by utilities to FDEP) by the utility's permanent population for that year. Each utility's per capita was calculated for 2012 to 2016, then averaged for the 5 years.

3 **Potable Water Demands** (daily average annual finished water in mgd) **–** The current (2016) and projected (2020 to 2040) demands were calculated by multiplying the PWS utility's average 2012-2016 per capita by the estimated service area populations for the respective years.

4 **Allocation from the Water Use Permit** – The gross (raw) surface water and groundwater (from the SAS and FAS) allocations as described in the permit. The 2016 allocation is assumed to continue through 2040 unless noted otherwise. If a utility sells bulk net (finished) water to another utility, the amount of raw water needed to provide the finished water is listed in parenthesis but does not count toward the allocation; it is for reference only.

5 **Total Allocation** – The total gross (raw) water allocation in the water use permit. For utilities withdrawing from multiple sources, the total allocation may be less than the sum of the individual source allocations due to limits on the sources; this is indicated in the appropriate profiles.

6 **FDEP Permitted Capacity** – The existing net (finished) water capacity of the WTPs owned/operated by the utility, as provided by the FDEP (2016), split into the capacity available to process water from the SAS and the FAS. The projected net (finished) water capacity includes the capacity created by future planned projects (Item 9). Project capacity to be completed by 2020 is shown in the 2020 column, capacity to be completed between 2021 and 2030 is in the 2030 column, and capacity to be completed between 2031 and 2040 is in the 2040 column.

7 **Nonpotable Alternative Water Source Capacity** – The capacity of the nonpotable alternative water sources, including reclaimed water, ASR, and surface water/stormwater. Reclaimed water is the wastewater treatment facility capacity to produce reclaimed water as provided by the FDEP (2017). ASR and surface water/stormwater capacity is the storage capacity of the project as listed in the water use permit or provided by the PWS utility. Additional capacity is from projects planned by the utility (Item 10). Project capacity to be completed by 2020 is shown in the 2020 column, capacity to be completed between 2021 and 2030 is in the 2030 column, and capacity to be completed between 2031 and 2040 is in the 2040 column.

8 **Projects Summary** – The potable and nonpotable water supply projects the utility is proposing to construct. All proposed projects have been screened by SFWMD water supply planning and water use permitting staff to determine if a project could be permitted.

9 **Potable Projects Summary** – A description of the potable water supply projects the utility is proposing to construct, including the project water source, completion date, total capital cost, and design capacity. Only projects that produce additional potable water (e.g., wells, WTPs) are included; maintenance or replacement projects are not included. Projects to be completed by 2020 have the projected design capacity shown in the 2020 column, projects to be completed between 2021 and 2030 have the projected design capacity in the 2030 column, and projects to be completed between 2031 and 2040 have the projected design capacity in the 2040 column. The projected capacity totals are added to the appropriate columns in Item 6.

10 **Nonpotable Projects Summary** – A description of the nonpotable water supply projects the utility is proposing to construct, including the project water source, completion date, total capital cost, and design capacity. Only projects that produce additional nonpotable water or water storage are included; maintenance or replacement projects are not included. Projects to be completed by 2020 have the projected design capacity shown in the 2020 column, projects to be completed between 2021 and 2030 have the projected design capacity in the 2030 column, and projects to be completed between 2031 and 2040 have the projected design capacity in the 2040 column. The projected capacity totals are added to the appropriate columns in Item 7.

11 **Total Projected Cumulative Design Capacity for New Water 2020, 2030, or 2040** – The total projected cost and capacity of potable and nonpotable water supply projects the utility is proposing to construct between 2016 and 2040.

PALM BEACH COUNTY

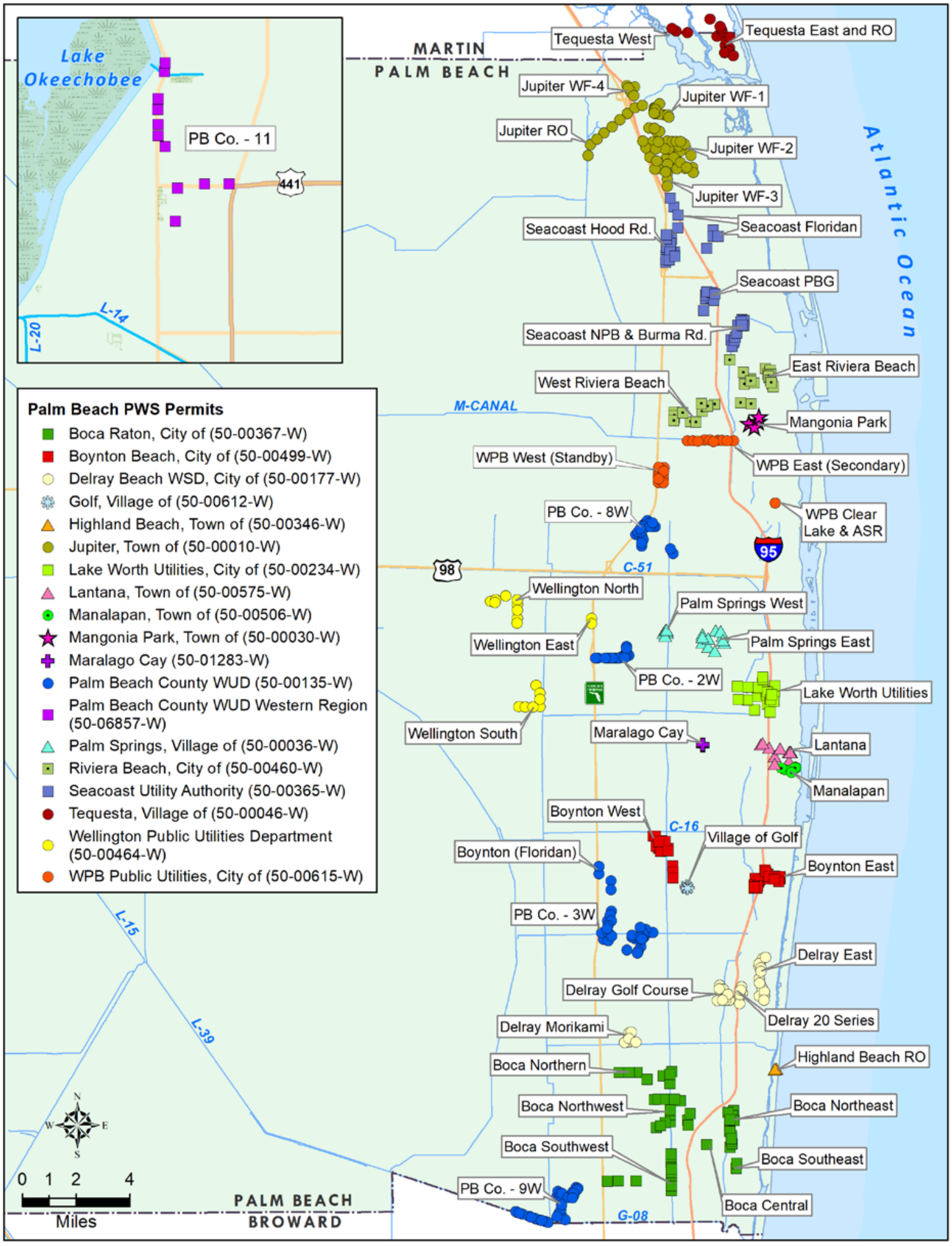

Figure E-1. Existing Public Water Supply wellfields in Palm Beach County.

CITY OF BOCA RATON

Service Area: City of Boca Raton and unincorporated areas of Palm Beach County

Description: Potable water supplies are obtained from six SAS wellfields, and water is treated at two WTPs using lime softening and nanofiltration at the same location. In 2016, the City was designated a 100 percent reuse (capacity) facility by FDEP and was deemed to have met the reuse requirements of the Ocean Outfall Law. The City maintains interconnections with the City of Deerfield Beach, City of Delray Beach Water and Sewer Department, Town of Highland Beach, and PBCWUD.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	113,040	117,109	124,630	129,336
Average 2012-2016 Per Capita (gallons per day finished water)	299			
Potable Water Demands (daily average annual finished water in mgd)	**33.80**	**35.02**	**37.26**	**38.67**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00367-W (expires 2028)			
SAS	51.54			
FAS	0.00			
Total Allocation	**51.54**			
FDEP Potable Water Treatment Capacity (PWS ID # 4500130)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	70.00	70.00	70.00	70.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**70.00**	**70.00**	**70.00**	**70.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	17.50	17.50	17.50	17.50
Total Nonpotable Capacity	**17.50**	**17.50**	**17.50**	**17.50**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

PALM BEACH

CITY OF BOYNTON BEACH

Service Area: City of Boynton Beach; towns of Briny Breezes, Hypoluxo, and Ocean Ridge; and unincorporated areas of Palm Beach County

Description: Potable water supplies are obtained from two SAS wellfields, and water is treated at two WTPs that use lime softening and nanofiltration. The water supply system is augmented by two ASR wells that provide water and reduce pumping of the eastern wellfield during the dry season. The city maintains interconnections with the City of Delray Beach, Town of Lantana, Village of Golf, and PBCWUD.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	107,646	113,090[a]	126,509	134,809
Average 2012-2016 Per Capita (gallons per day finished water)	119			
Potable Water Demands (daily average annual finished water in mgd)	**12.81**	**13.46**	**15.05**	**16.04**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00499-W (expires 2029)			
SAS	16.58[b]			
FAS	6.42[c]			
Total Allocation	**20.86[d]**			
FDEP Potable Water Treatment Capacity (PWS ID # 4500145)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	29.64	29.64	29.64	29.64
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**29.64**	**29.64**	**29.64**	**29.64**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	8.00	8.00	11.00[e]	11.00[e]
ASR	4.00	4.00	4.00	4.00
Total Nonpotable Capacity	**12.00**	**12.00**	**15.00**	**15.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	0.00	0.00	0.00
Total New Water			**$0.00**	0.00	0.00	0.00

[a] In October 2018, the City Commission approved an agreement with the Town of Hypoluxo to provide the Town with finished water beginning in 2020. The additional population and demand are included in the City's data starting in 2020.

[b] The City's baseline SAS allocation is 16.58 mgd. The current water use permit states the City may apply for an increased SAS allocation of up to 4.23 mgd if the City can document increased demand and completes a reuse implementation plan that includes the termination of existing permits by future reuse customers.

[c] Includes 1.42 mgd for proposed FAS withdrawals. The remaining 5.00 mgd are from ASR during the dry season. The ASR volumes are equal to reductions in the eastern wellfield pumpage such that the City does not exceed its annual allocation.

[d] The water use permit limits the total annual withdrawals from all sources to 7,615 million gallons, an average of 20.86 mgd.

[e] Projection to meet Ocean Outfall Law requirements. To meet this capacity, the City has suggested several potential end users; see **Appendix F** for more information.

CITY OF DELRAY BEACH WATER AND SEWER DEPARTMENT

Service Area: City of Delray Beach, Town of Gulf Stream, and unincorporated areas of Palm Beach County

Description: Potable water supplies are obtained from four SAS and FAS wellfields, and water is treated at one lime softening WTP near the Eastern wellfield. The water use permit contains limits on the Eastern, Morikami, 20-Series, and Golf Course wellfields. The City has converted an ASR well to an FAS well for backup supply of brackish water for blending with fresh groundwater, but withdrawals may not exceed 1.50 mgd. The City is committed to replacing permitted SAS irrigation withdrawals with reclaimed water. The city maintains interconnections with the Town of Highland Beach.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	67,272	70,520	77,079	81,874
Average 2012-2016 Per Capita (gallons per day finished water)	229			
Potable Water Demands (daily average annual finished water in mgd)	**15.41**	**16.15**	**17.65**	**18.75**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00177-W (expires 2030)			
SAS	19.10			
FAS	1.50[a]			
Total Allocation	**19.10**			
FDEP Potable Water Treatment Capacity (PWS ID # 4500351)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	26.00	26.00	26.00	26.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**26.00**	**26.00**	**26.00**	**26.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	5.00	5.00	8.00[b]	8.00[b]
Total Nonpotable Capacity	**5.00**	**5.00**	**8.00**	**8.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

[a] The City's FAS well is a backup source for blending limited to 1.50 mgd.
[b] Projection to meet Ocean Outfall Law requirements. To meet this capacity, the City has suggested several potential end users; see **Appendix F** for more information.

PALM BEACH

VILLAGE OF GOLF

Service Area: Village of Golf and unincorporated areas of Palm Beach County

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening and ultrafiltration. The Village maintains an interconnection with the City of Boynton Beach.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	2,904	2,967	3,056	3,077
Average 2012-2016 Per Capita (gallons per day finished water)	151			
Potable Water Demands (daily average annual finished water in mgd)	**0.44**	**0.45**	**0.46**	**0.46**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00612-W (expires 2033)			
SAS	0.69			
FAS	0.00			
Total Allocation	**0.69**			
FDEP Potable Water Treatment Capacity (PWS ID # 4501528)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	0.86	0.86	0.86	0.86
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.86**	**0.86**	**0.86**	**0.86**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

TOWN OF HIGHLAND BEACH

Service Area: Town of Highland Beach

Description: Potable water supplies are obtained from one FAS wellfield, and water is treated at one WTP using RO. The Town maintains interconnections with the City of Delray Beach.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	3,828	3,911	4,030	4,058
Average 2012-2016 Per Capita (gallons per day finished water)	334			
Potable Water Demands (daily average annual finished water in mgd)	**1.28**	**1.31**	**1.35**	**1.36**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00346-W (expires 2026)			
SAS	0.00			
FAS	3.15			
Total Allocation	**3.15**			
FDEP Potable Water Treatment Capacity (PWS ID # 4500609)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	0.00	0.00	0.00	0.00
FAS	3.00	3.00	3.00	3.00
Total Potable Capacity	**3.00**	**3.00**	**3.00**	**3.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	0.00	0.00	0.00	0.00

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

P A L M B E A C H

TOWN OF JUPITER

Service Area: Towns of Jupiter and Juno Beach, and unincorporated areas of Martin and Palm Beach counties

Description: Potable water supplies are obtained from four SAS and FAS wellfields. FAS water is treated at an RO WTP and SAS water is treated at a nanofiltration WTP at the same location. The water use permit includes an overlap in allocations from SAS and FAS sources to provide operational flexibility on a seasonal basis, but the permit has a maximum annual allocation from the two sources combined along with specific wellfield withdrawal limitations. The Town maintains interconnections with the Seacoast Utility Authority and Village of Tequesta.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	72,984	75,871	81,381	85,047
Average 2012-2016 Per Capita (gallons per day finished water)	215			
Potable Water Demands (daily average annual finished water in mgd)	**15.69**	**16.31**	**17.50**	**18.29**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00010-W (expires 2030)			
SAS	18.80			
FAS	11.71			
Total Allocation	**24.41**			
FDEP Potable Water Treatment Capacity (PWS ID # 4501491)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	16.30	16.30	16.30	16.30
FAS	13.70	13.70	13.70	13.70
Total Potable Capacity	**30.00**	**30.00**	**30.00**	**30.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Stormwater	0.00	16.16	16.16	16.16
Total Nonpotable Capacity	**0.00**	**16.16**	**16.16**	**16.16**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
Surface water recharge system	Stormwater	2019	$1.76	16.16	16.16	16.16
Total Nonpotable Water			**$1.76**	**16.16**	**16.16**	**16.16**
Total New Water			**$1.76**	**16.16**	**16.16**	**16.16**

CITY OF LAKE WORTH UTILITIES

Service Area: City of Lake Worth, portion of the Town of Lake Clarke Shores, and unincorporated areas of Palm Beach County

Description: Potable water supplies are obtained from two SAS and FAS wellfields. FAS water is treated at an RO WTP and SAS water is treated at a lime softening WTP at the same location. In 2011, the FAS wellfield was put into production to reduce the vulnerability of the Eastern wellfield to saltwater intrusion. The City maintains interconnections with the Town of Lantana, PBCWUD, and City of West Palm Beach Public Utilities.

Population and Finished Water Demand							
				Existing	Projected		
				2016	2020	2030	2040
Population				47,397	49,608	54,033	57,225
Average 2014-2016 Per Capita (gallons per day finished water)				107[a]			
Potable Water Demands (daily average annual finished water in mgd)				**5.07**	**5.31**	**5.78**	**6.12**
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 50-00234-W (expires 2032)			
SAS				5.25			
FAS				6.00			
Total Allocation				**11.25**			
FDEP Potable Water Treatment Capacity (PWS ID # 4500773)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2016	2020	2030	2040
SAS				12.90	12.90	12.90	12.90
FAS				4.50	4.50	4.50	4.50
Total Potable Capacity				**17.40**	**17.40**	**17.40**	**17.40**
Nonpotable Alternative Water Source Capacity (mgd)							
Total Nonpotable Capacity				**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

[a] The average per capita was calculated using 2014-2016 finished water data because of significant SAS restrictions in earlier years due to saltwater intrusion issues.

TOWN OF LANTANA

Service Area: Town of Lantana

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using nanofiltration. The water supply is vulnerable to saltwater intrusion; therefore, the Town constructed two additional wells farther from the coast to provide additional wellfield operational flexibility. The Town maintains interconnections with the City of Boynton Beach, City of Lake Worth, and Town of Manalapan.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	10,943	11,215	11,634	11,795
Average 2012-2016 Per Capita (gallons per day finished water)	175			
Potable Water Demands (daily average annual finished water in mgd)	**1.92**	**1.96**	**2.04**	**2.06**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00575-W (expires 2028)			
SAS	2.48			
FAS	0.00			
Total Allocation	**2.48**			
FDEP Potable Water Treatment Capacity (PWS ID # 4500784)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	3.84	3.84	3.84	3.84
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**3.84**	**3.84**	**3.84**	**3.84**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	0.00	0.00	0.00	0.00

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

TOWN OF MANALAPAN

Service Area: Towns of Manalapan and Hypoluxo

Description: Potable water supplies are obtained from one SAS and FAS wellfield, and water is treated at one WTP using RO. The Town maintains multiple interconnections with the Town of Lantana.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	2,552	2,626[a]	446	478
Average 2012-2016 Per Capita (gallons per day finished water)	442			
Potable Water Demands (daily average annual finished water in mgd)	**1.13**	**1.16**	**0.91**	**0.98**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00506-W (expires 2023)			
SAS	0.58			
FAS	1.34			
Total Allocation	**1.92**			
FDEP Potable Water Treatment Capacity (PWS ID # 4500840)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	0.65	0.65	0.65	0.65
FAS	1.70	1.70	1.70	1.70
Total Potable Capacity	**2.35**	**2.35**	**2.35**	**2.35**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

[a] The Town of Hypoluxo has terminated its current water services agreement with the Town of Manalapan, effective 2020. The Hypoluxo population and demands are not included in Manalapan's data starting in 2021.

P A L M B E A C H

TOWN OF MANGONIA PARK

Service Area: Town of Mangonia Park

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	1,990	2,156	2,527	2,837
Average 2012-2016 Per Capita (gallons per day finished water)	176			
Potable Water Demands (daily average annual finished water in mgd)	**0.35**	**0.38**	**0.44**	**0.50**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00030-W (expires 2027)			
SAS	0.58			
FAS	0.00			
Total Allocation	**0.58**			
FDEP Potable Water Treatment Capacity (PWS ID # 4500841)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	1.08	1.08	1.08	1.08
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**1.08**	**1.08**	**1.08**	**1.08**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

MARALAGO CAY

Service Area: Unincorporated area of Palm Beach County

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	1,063	1,093	1,142	1,167
Average 2012-2016 Per Capita (gallons per day finished water)	225			
Potable Water Demands (daily average annual finished water in mgd)	**0.24**	**0.25**	**0.26**	**0.26**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-01283-W (expires 2035)			
SAS	0.27			
FAS	0.00			
Total Allocation	**0.27**			
FDEP Potable Water Treatment Capacity (PWS ID # 4500062)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	0.42	0.42	0.42	0.42
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.42**	**0.42**	**0.42**	**0.42**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

PALM BEACH COUNTY WATER UTILITIES DEPARTMENT

Service Area: Cities of Atlantis, Boynton Beach, Greenacres, Lake Worth, Parkland, West Lake, and West Palm Beach; towns of Cloud Lake, Glen Ridge, Haverhill, Lake Clarke Shores, and Loxahatchee Groves; villages of Palm Springs, Royal Palm Beach, and Wellington; and unincorporated areas of Palm Beach County

Description: Potable water supplies are obtained from four SAS wellfields, and water is treated at two lime softening and two nanofiltration WTPs in the Eastern Region. The wellfields are interconnected with 42-inch water mains, allowing PBCWUD to operate a unified distribution system. The PBCWUD's bulk sales in 2016 were 2.36 mgd, which were distributed to the cities of Boca Raton, Boynton Beach, Atlantis, and Lake Worth, West Palm Beach; Seminole Improvement District, Seacoast Utility Authority; and Town of Lake Clark Shores.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	498,848	534,857	613,513	677,834
Average 2012-2016 Per Capita (gallons per day finished water)	111			
Potable Water Demands (daily average annual finished water in mgd)	**55.37**	**59.37**	**68.10**	**75.24**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00135-W (expires 2023)			
SAS	79.99			
FAS (ASR wells for blending with SAS)	7.00			
Bulk Raw Water (finished water sale to multiple municipalities in 2016)	(2.61)[a]			
Total Allocation	**86.99**			
FDEP Potable Water Treatment Capacity (PWS ID # 4504393)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	103.28	103.28	103.28	103.28
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**103.28**	**103.28**	**103.28**	**103.28**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	25.00[b]	25.00[b]	35.50[b]	35.50[b]
Total Nonpotable Capacity	**25.00**	**25.00**	**35.50**	**35.50**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
South County Reclaimed Phase I[c]	Reclaimed Water	2021	$22.00	0.00	10.50	10.50
Total Nonpotable Water			**$22.00**	**0.00**	**10.50**	**10.50**
Total New Water			**$22.00**	**0.00**	**10.50**	**10.50**

[a] The amount of raw water needed to produce 2.36 mgd of finished water, which is the amount of bulk water the PBCWUD provided to municipalities in 2016.

[b] The PBCWUD is contracted to provide FPL with up to 22.00 mgd of reclaimed water for cooling purposes at the West County Energy Center. FPL currently uses approximately 14.00 mgd of that amount. This is in addition to the reclaimed capacity listed (25.00 mgd).

[c] The PBCWUD is contracted to receive up to 10.50 mgd of reclaimed water from BCWWS.

PALM BEACH COUNTY WATER UTILITIES DEPARTMENT WESTERN REGION

Service Area: Cities of Belle Glade, Pahokee, and South Bay

Description: Potable water supplies are obtained from one FAS wellfield, and water is treated at one WTP using RO. PBCWUD Western Region, formerly known as the Glades Utility Authority, became part of PBCWUD in April 2013.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	34,886	36,137	38,446	39,888
Average 2012-2016 Per Capita (gallons per day finished water)	157			
Potable Water Demands (daily average annual finished water in mgd)	**5.48**	**5.67**	**6.04**	**6.26**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-06857-W (expires 2025)			
SAS	0.00			
FAS	9.43			
Total Allocation	**9.43**			
FDEP Potable Water Treatment Capacity (PWS ID # 4505005)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	0.00	0.00	0.00	0.00
FAS	10.00	10.00	10.00	10.00
Total Potable Capacity	**10.00**	**10.00**	**10.00**	**10.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

VILLAGE OF PALM SPRINGS

Service Area: Village of Palm Springs, Town of Lake Clarke Shores, and unincorporated areas of Palm Beach County

Description: Potable water supplies are obtained from two SAS wellfields, and water is treated at two interconnected WTPs utilizing ion exchange, followed by lime softening. The Town of Lake Clarke Shores purchases and distributes finished water from the Village of Palm Springs; in 2016, the Town purchased 0.16 mgd.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	47,899	50,206	54,860	58,260
Average 2012-2016 Per Capita (gallons per day finished water)	81			
Potable Water Demands (daily average annual finished water in mgd)	**3.88**	**4.07**	**4.44**	**4.72**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00036-W (expires 2029)			
SAS	4.62			
FAS	0.00			
Total Allocation	**4.62**			
FDEP Potable Water Treatment Capacity (PWS ID # 4501058)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	10.00	10.00	10.00	10.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**10.00**	**10.00**	**10.00**	**10.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	0.00	0.00	0.00	0.00

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
R.L. Pratt Washwater Recovery Basin	SAS	2020	$1.75	0.00	0.20	0.20
Purchase bulk water from PBCWUD[a]	SAS	2030	NA	0.00	0.30[a]	0.30[a]
Total Potable Water			**$1.75**	**0.00**	**0.50[a]**	**0.50[a]**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$1.75**	**0.00**	**0.50[a]**	**0.50[a]**

[a] This project is suggested by the SFWMD in order for the Village of Palm Springs to have adequate water supply to meet 2030 to 2040 demands. The Village of Palm Springs can choose to implement this project or determine an alternative source to meet the 2030 to 2040 demands.

CITY OF RIVIERA BEACH

Service Area: City of Riviera Beach and Town of Palm Beach Shores

Description: Potable water supplies are obtained from the SAS in an eastern and western wellfield, and water is treated at one WTP using lime softening. The City maintains interconnections with the Town of Mangonia Park, Seacoast Utility Authority, and City of West Palm Beach Public Utilities Department. The City is developing strategies to reduce water loss, by upgrading water meters, and the amount of system flushing to lower the per capita use rate and decrease future demands. The City maintains interconnections with the Seacoast Utility Authority and City of West Palm Beach.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	39,805	42,467	48,212	52,835
Average 2012-2016 Per Capita (gallons per day finished water)	184			
Potable Water Demands (daily average annual finished water in mgd)	**7.32**	**7.81**	**8.87**	**9.72**

SFWMD Water Use Permitted Allocation (mgd)	
Potable Water Source	Permit Number 50-00460-W (expires 2032)
SAS	9.08
FAS	0.00
Total Allocation	**9.08**

FDEP Potable Water Treatment Capacity (PWS ID # 4501229)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	17.50	17.50	17.50	17.50
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**17.50**	**17.50**	**17.50**	**17.50**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	0.00	0.00	0.00	0.00

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
Purchase bulk water from PBCWUD or City of West Palm Beach[a]	SAS	2030	N/A	0.00	1.00[a]	1.00[a]
Total Potable Water			**$0.00**	**0.00**	**1.00[a]**	**1.00[a]**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**1.00[a]**	**1.00[a]**

[a] This project is suggested by the SFWMD in order for the City of Riviera Beach to have adequate water supply to meet 2030 to 2040 demands. The City of Riviera Beach can choose to implement this project or determine an alternative source to meet the 2030 to 2040 demands.

P A L M B E A C H

SEACOAST UTILITY AUTHORITY

Service Area: Towns of Juno Beach and Lake Park, Village of North Palm Beach, City of Palm Beach Gardens, and unincorporated areas of Palm Beach County

Description: Potable water supplies are obtained from four SAS wellfields and one FAS wellfield, and water is treated at an RO WTP that began operating in 2013 and at a nanofiltration WTP that replaced the lime softening WTP in 2013. The water use permit includes an overlap in allocations from SAS and FAS sources to provide operational flexibility on a seasonal basis, but the permit has a maximum annual allocation from the two sources combined along with specific wellfield withdrawal limitations. The utility maintains interconnections with the Town of Jupiter and City of Riviera Beach.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	90,703	94,330	101,276	105,926
Average 2012-2016 Per Capita (gallons per day finished water)	191			
Potable Water Demands (daily average annual finished water in mgd)	**17.32**	**18.02**	**19.34**	**20.23**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00365-W (expires 2032)			
SAS	22.30			
FAS	8.90			
Total Allocation	**26.92**			
FDEP Potable Water Treatment Capacity (PWS ID # 4501124)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	27.50	27.50	27.50	27.50
FAS	3.00	3.00	3.00	3.00
Total Potable Capacity	**30.50**	**30.50**	**30.50**	**30.50**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	15.00	15.00	15.00	15.00
Total Nonpotable Capacity	**15.00**	**15.00**	**15.00**	**15.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
FAS well F-6	FAS	2018	$4.00	2.00	2.00	2.00
FAS well F-9	FAS	2020	$4.00	0.00	2.00	2.00
Total Potable Water			**$8.00**	**2.00**	**4.00**	**4.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$8.00**	**2.00**	**4.00**	**4.00**

VILLAGE OF TEQUESTA

Service Area: Village of Tequesta, towns of Jupiter Inlet Colony and Jupiter Island, and unincorporated Palm Beach and Martin counties

Description: Potable water supplies are obtained from three SAS and FAS wellfields, and SAS water is treated at one WTP using sand filtration, and FAS water is treated at an RO WTP. The water use permit includes an overlap in allocations from SAS and FAS sources to provide operational flexibility; however, the permit has a maximum total annual allocation from the two sources. In 1996, the Village began to reduce its dependence on the SAS and use the FAS as its primary supply source. The Village maintains an interconnection with the Town of Jupiter.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	8,668	8,866	9,155	9,241
Average 2012-2016 Per Capita (gallons per day finished water)	309			
Potable Water Demands (daily average annual finished water in mgd)	**2.68**	**2.74**	**2.83**	**2.86**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00046-W (expires 2031)			
SAS	1.10			
FAS	3.43			
Total Allocation	**4.37**			
FDEP Potable Water Treatment Capacity (PWS ID # 4501438)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	2.73	2.73	2.73	2.73
FAS	3.60	3.60	3.60	3.60
Total Potable Capacity	**6.33**	**6.33**	**6.33**	**6.33**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	0.00	0.00	0.00	0.00

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

P A L M   B E A C H

WELLINGTON PUBLIC UTILITIES DEPARTMENT

Service Area: Villages of Wellington and Royal Palm Beach, and unincorporated areas of Palm Beach County

Description: Potable water supplies are obtained from three SAS wellfields. Water from the northern wellfield is slightly brackish and treated at a membrane filtration WTP. Water from the southern and eastern wellfields is fresher and treated at a lime softening WTP at the same location. The utility maintains an interconnection with the PBCWUD.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	55,587	57,640	61,468	63,908
Average 2012-2016 Per Capita (gallons per day finished water)	107			
Potable Water Demands (daily average annual finished water in mgd)	**5.95**	**6.17**	**6.58**	**6.84**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00464-W (expires 2031)			
SAS	8.02			
FAS	0.00			
Total Allocation	**8.02**			
FDEP Potable Water Treatment Capacity (PWS ID # 4500014)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	12.80	12.80	12.80	12.80
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**12.80**	**12.80**	**12.80**	**12.80**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	1.00	2.30	3.90	7.50
Total Nonpotable Capacity	**1.00**	**2.30**	**3.90**	**7.50**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
Phased reclaimed system expansions	Reclaimed Water	2016-2040	$4.00	1.30	2.90	6.50
Total Nonpotable Water			**$4.00**	**1.30**	**2.90**	**6.50**
Total New Water			**$4.00**	**1.30**	**2.90**	**6.50**

CITY OF WEST PALM BEACH PUBLIC UTILITIES

Service Area: City of West Palm Beach, and towns of Palm Beach, South Palm Beach, and unincorporated areas of Palm Beach County

Description: Potable water supplies are obtained from surface water and the SAS, and water is treated at one WTP using lime softening. Surface water is stored in Grassy Waters Preserve, Lake Mangonia, and Clear Lake. When used, the SAS wells discharge to the M Canal, typically during very dry conditions. The City is authorized to capture water from the C-17 and C-51 canals when they are discharging to tide. The City provides 0.50 mgd of finished bulk water to the Solid Waste Authority of Palm Beach County (SWAPBC) (0.15 mgd) and PBCWUD (0.35 mgd).

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	115,088	121,366	134,399	144,341
Average 2012-2016 Per Capita (gallons per day finished water)	243			
Potable Water Demands (daily average annual finished water in mgd)	**27.97**	**29.49**	**32.66**	**35.07**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 50-00615-W (expires 2033)			
SAS	6.39[a]			
FAS	0.00			
Surface Water (Clear Lake)	41.20[b]			
Surface Water (SFWMD L-8 Canal, M Canal, and Grassy Waters Preserve)	66.98[c]			
Bulk Raw Water (finished water sale to SWAPBC and PBCWUD)	(0.50)			
Total Allocation	**41.20**			
FDEP Potable Water Treatment Capacity (PWS ID # 4501559)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	47.00	47.00	47.00	47.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**47.00**	**47.00**	**47.00**	**47.00**
Nonpotable Alternative Water Source Capacity (mgd)				
ASR	8.00	14.00	14.00	14.00
Reclaimed Water	0.70	0.70	0.70	0.70
Stormwater	0.00	13.00	13.00	13.00
Total Nonpotable Capacity	8.70	27.70	27.70	27.70

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
C-17 Pump Station	Stormwater	2017	$1.50	10.00	10.00	10.00
ASR Well Expansion Program	ASR	ND	$9.00	6.00	6.00	6.00
Grassy Waters Preserve Water Quality, Diversion, and Storage Improvements	Stormwater	ND	$6.00	3.00	3.00	3.00
Total Nonpotable Water			**$16.50**	**19.00**	**19.00**	**19.00**
Total New Water			**$16.50**	**19.00**	**19.00**	**19.00**

[a] Withdrawals from the Eastern and Western (SAS) wellfields are limited to 60 days per year on a rolling 12-month basis.
[b] Public Water Supply portion of permit; surface water is withdrawn from Clear Lake.
[c] Diversion and Impoundment portion of permit; surface water from L-8 Canal is conveyed via M-Canal into Grassy Waters and/or Clear Lake.

BROWARD COUNTY

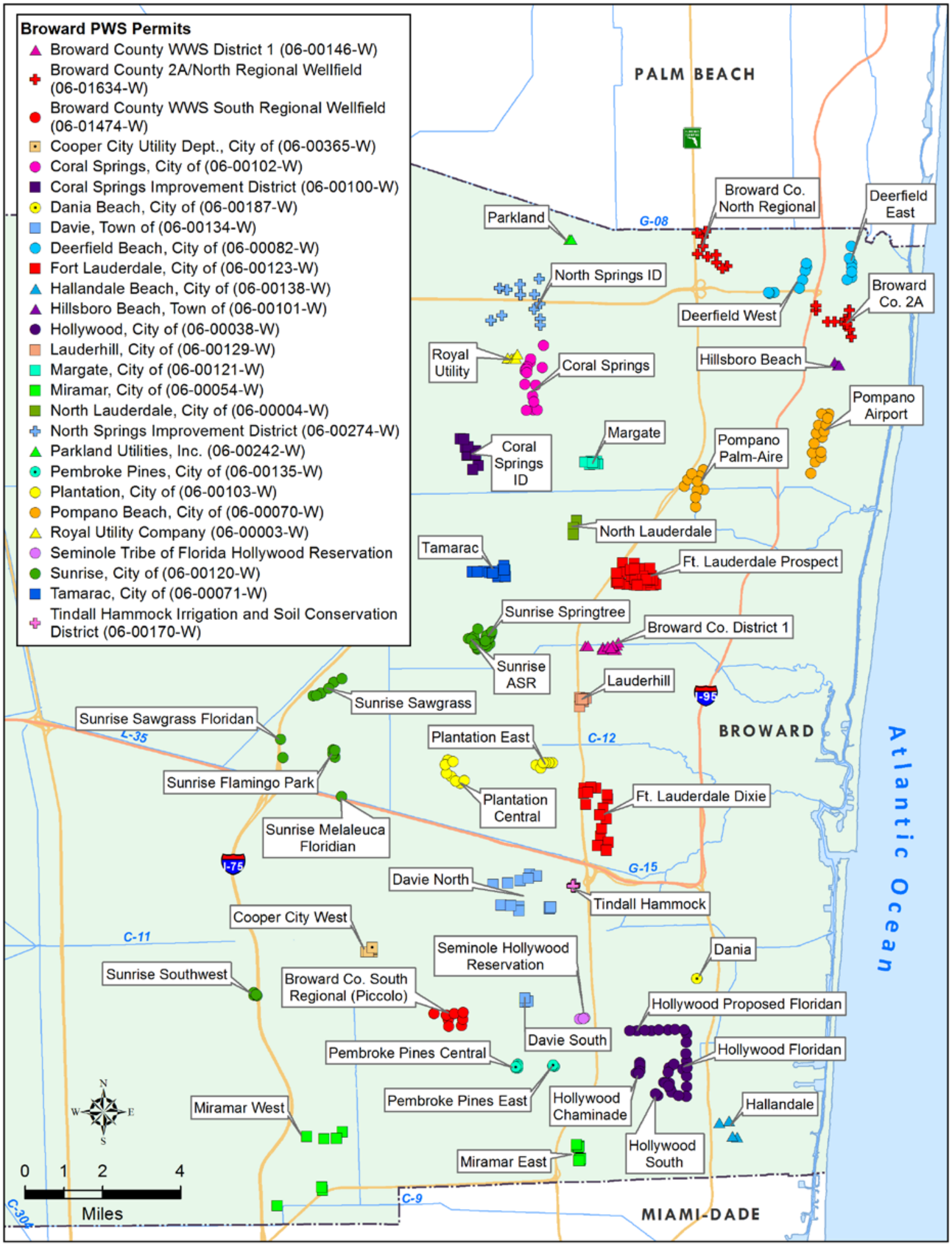

Figure E-2. Existing Public Water Supply wellfields in Broward County.

BROWARD COUNTY WATER AND WASTEWATER SERVICES DISTRICT 1

Service Area: All or portions of the cities of Fort Lauderdale, Lauderdale Lakes, Lauderhill, North Lauderdale, Oakland Park, Plantation, Pompano Beach, and Tamarac, and unincorporated areas of Broward County

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. Two FAS wells were constructed but not active. The utility may expand the WTP by developing an FAS water source and constructing an RO treatment facility to serve future demands. The utility maintains interconnections with the cities of Fort Lauderdale, Lauderhill, and Tamarac.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	81,380	85,750	94,977	101,686
Average 2012-2016 Per Capita (gallons per day finished water)	92			
Potable Water Demands (daily average annual finished water in mgd)	**7.49**	**7.89**	**8.74**	**9.36**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00146-W (expires 2028)			
SAS	10.04			
FAS	4.70			
Total Allocation	**13.90**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060167)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	16.00	16.00	16.00	16.00
FAS	0.00	0.00	3.00	3.00
Total Potable Capacity	**16.00**	**16.00**	**19.00**	**19.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
District 1 water supply improvement alternatives	FAS	2025	$5.60	0.00	3.00	3.00
Total Potable Water			**$5.60**	**0.00**	**3.00**	**3.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$5.60**	**0.00**	**3.00**	**3.00**

BROWARD COUNTY WATER AND WASTEWATER SERVICES DISTRICT 2A/NORTH REGIONAL WELLFIELD

Service Area: All or portions of the cities of Coconut Creek, Deerfield Beach, Lighthouse Point, Parkland, and Pompano Beach, and unincorporated areas of Broward County

Description: Potable water supplies are obtained from two SAS wellfields (2A and North Regional). The utility may develop an FAS wellfield and RO WTP at the 2A wellfield or make use of the C-51 Reservoir. Water is treated at the 2A WTP using lime softening, and the North Regional wellfield provides approximately 6.20 mgd of additional raw water to the 2A WTP. The utility provides up to 0.60 mgd of raw water to the City of Deerfield Beach. The utility maintains interconnections with the City of Deerfield Beach, Town of Hillsboro Beach, PBCWUD, and City of Pompano Beach.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	118,161	121,697	128,006	130,991
Average 2012-2016 Per Capita (gallons per day finished water)	106			
Potable Water Demands (daily average annual finished water in mgd)	**12.53**	**12.90**	**13.57**	**13.89**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-01634-W (expires 2028)			
SAS	17.50			
FAS	4.60			
Bulk Raw Water Sale (City of Deerfield Beach)	(0.60)			
Total Allocation	**22.06**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060163)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	40.00	40.00	40.00	40.00
FAS	0.00	0.00	6.00	6.00
Total Potable Capacity	**40.00**	**40.00**	**46.00**	**46.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	10.00	10.00	26.00[a]	26.00[a]
Total Nonpotable Capacity	**10.00**	**10.00**	**26.00[a]**	**26.00[a]**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
District 2A WTP expansion	FAS	2026	$33.34	0.00	6.00	6.00
Total Potable Water			**$33.34**	**0.00**	**6.00**	**6.00**
Nonpotable Water						
C-51 Reservoir Storage Phase 1	Surface Water	2026	$13.80	0.00	3.00	3.00
Total Nonpotable Water			**$13.80**	**0.00**	**3.00**	**3.00**
Total New Water			**$47.14**	**0.00**	**9.00**	**9.00**

[a] Projection to meet Ocean Outfall Law requirements. To meet this capacity, the utility plans to increase water reuse throughout the county and provide reclaimed water to PBCWUD, NSID, Pompano Beach Highlands, and the City of Coconut Creek. See **Appendix F** for more information.

BROWARD COUNTY WATER AND WASTEWATER SERVICES SOUTH REGIONAL WELLFIELD

Service Area: The BCWWS-SRW supplies bulk raw water to the cities of Dania Beach, Hallandale Beach, and Hollywood to supplement existing raw water supplies. A portion of the raw water provided to the City of Hollywood is treated and sold back to BCWWS to serve the District 3 service area demand. The District 3 service area includes cities of Miramar, West Park, the towns of Davie and Pembroke Park, and unincorporated areas of Broward County. The BCWWS-SRW also provides bulk water to the FPL Dania Beach Energy Center for industrial use.

Description: Potable water is obtained from an SAS wellfield. The Water Use Permit was issued in March 2018 for a base condition water use of 11.62 mgd. BCWWS purchased 3.00 mgd of C-51 Reservoir storage to offset additional raw water withdrawals in order to meet increased demands from BCWWS District 3. Increased demands for the cities of Dania Beach and Hallandale Beach will be met through 2022, after which the cities must identify an alternate source.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	0[a]	0[a]	0[a]	0[a]
Average 2012-2016 Per Capita (gallons per day finished water)	0			
Potable Water Demands (daily average annual finished water in mgd)	**0.00**	**0.00**	**0.00**	**0.00**

SFWMD Water Use Permitted Allocation (mgd)			
Potable Water Source	Permit Number 06-01474-W (expires 2065)		
	2018-2022 (Temporary Borrowing Allocation)	2023-2038 (Base Allocation)	2038-2065 (C-51 Offset Allocation)
SAS	15.64	11.62	5.23
FAS	0.00	0.00	0.00
Bulk Raw Water Withdrawals (to City of Dania Beach)	(3.02)[b]	(1.58)[b]	(2.23)
Bulk Raw Water Withdrawals (to City of Hallandale Beach)	(3.61)[c]	(3.26)[c]	(0.10)
Bulk Raw Water Withdrawals (to City of Hollywood for use and for BCWWS District 3)	(7.27)[d]	(5.78)[d]	2.87
Bulk Raw Water Withdrawals (to FPL)	(1.74)[e]	(1.00)[e]	0.03
Total Allocation	**15.64[f]**	**11.62[f]**	**5.23[f]**

FDEP Potable Water Treatment Capacity (PWS ID # N/A)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	0.00	0.00	0.00	0.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Surface Water	**0.00**	**0.00**	**3.00**	**3.00**
Total Nonpotable Capacity	**0.00**	**0.00**	**3.00**	**3.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
C-51 Reservoir Storage Phase 1[g]	Surface Water	2020	ND	0.00	3.00	3.00
Total Nonpotable Water			**$13.80**	**0.00**	**3.00**	**3.00**
Total New Water			**$13.80**	**0.00**	**3.00**	**3.00**

[a] The BCWWS-SRW supplies raw water and is not associated with dedicated treatment or storage facilities.

[b] The BCWWS-SRW will provide all of the City of Dania Beach's raw water demand until 2023, estimated to be 3.02 mgd. From 2023 to 2038, Dania Beach's demand supplied by BCWWS-SRW will decrease to 1.58 mgd. Dania Beach will be responsible for obtaining an alternative water supply (C-51 Reservoir offset water or other source) to meet additional demand above the 1.58 mgd base conditions allocated from BCWWS-SRW.

[c] Between 2018 and 2023, the BCWWS-SRW can withdraw up to 3.61 mgd of raw water for the City of Hallandale Beach. From 2023 to 2038, the allocation will be reduced, by agreement, to 3.26 mgd. Hallandale Beach will be responsible for obtaining an alternative water supply (C-51 Reservoir offset water or other source) to meet additional demand above the 3.26 mgd base conditions allocated from BCWWS-SRW.

[d] Between 2018 and 2023, the BCWWS-SRW can withdraw up to 7.27 mgd of raw water for the City of Hollywood to meet BCWWS District 3 and Hollywood demands. From 2023 to 2038, the raw water allocation will be reduced, by agreement, to 5.78 mgd, for which the BCWWS-SRW has purchased 3.00 mgd of C-51 Reservoir Storage Capacity to offset additional raw water withdrawals above the base condition. Once the required volume of offset water is delivered, the BCWWS-SRW can withdraw up to 8.65 mgd (5.78 mgd of base condition and 2.87 mgd of offset water) for the City of Hollywood.

[e] In 2016, FPL received 1.28 mgd of raw water. From 2018 to 2023, the BCWWS-SRW can withdraw up to 1.74 mgd of raw water to serve FPL's industrial use. Between 2023 and 2065, the allocation will be reduced, by agreement, to 1.00 mgd of raw water due to more efficient processes.

[f] The base condition raw water allocation for the BCWWS-SRW is 11.62 mgd. From 2018 to 2023, a temporary borrowing allocation of 15.64 mgd will support bulk raw water users during development of alternative water supply source(s). The raw water allocation for 2023 to 2038 will be reduced to an 11.62-mgd base condition allocation, which must be renewed every 20 years. The completion of the C-51 Reservoir Storage Phase 1 project can provide an SAS offset allocation of 3.00 mgd for BCWWS District 3 and transmission losses. If the base condition is renewed in 2038 and the C-51 Reservoir Project is operational then the total allocation for BCWWS-SRW will be 16.85 mgd. If the City of Dania Beach or City of Hallandale Beach provide additional withdrawal offset water from the C-51 Reservoir, additional allocation for the BCWWS-SRW may be permittable.

[g] If the C-51 Reservoir Storage Phase 1 project is delayed or deviates from the milestone schedule listed in the permit, the BCWWS-SRW will need to identify a plan to recover from any delays to ensure an offset or an alternative water supply project is in place and operational by March 1, 2023.

CITY OF COOPER CITY UTILITY DEPARTMENT

Service Area: City of Cooper City and the Town of Southwest Ranches

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using nanofiltration. The City maintains interconnections with the Town of Davie, City of Pembroke Pines, and City of Sunrise.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	30,449	31,401	33,131	34,000
Average 2012-2016 Per Capita (gallons per day finished water)	104			
Potable Water Demands (daily average annual finished water in mgd)	**3.17**	**3.27**	**3.45**	**3.54**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00365-W (expires 2030)			
SAS	4.55			
FAS	0.00			
Total Allocation	**4.55**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060282)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	7.00	7.00	7.00	7.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**7.00**	**7.00**	**7.00**	**7.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	0.00	1.00	1.00	1.00
Total Nonpotable Capacity	0.00	1.00	1.00	1.00

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
Cooper City – Miramar Wastewater Reuse Agreement	Reclaimed Water	2017-2025	$3.50	1.00	1.00	1.00
Total Nonpotable Water			**$3.50**	**1.00**	**1.00**	**1.00**
Total New Water			**$3.50**	**1.00**	**1.00**	**1.00**

CITY OF CORAL SPRINGS

Service Area: A portion of the City of Coral Springs

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. The City maintains interconnections with the Coral Springs Improvement District, North Springs Improvement District, and Royal Utility Corporation.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	61,565	64,733	71,365	76,109
Average 2012-2016 Per Capita (gallons per day finished water)	101			
Potable Water Demands (daily average annual finished water in mgd)	**6.22**	**6.54**	**7.21**	**7.69**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00102-W (expires 2031)			
SAS	9.44			
FAS	0.00			
Total Allocation	**9.44**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060290)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	16.00	16.00	16.00	16.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**16.00**	**16.00**	**16.00**	**16.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	0.00	0.00	0.00	0.00

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

CORAL SPRINGS IMPROVEMENT DISTRICT

Service Area: A portion of the City of Coral Springs

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using RO. The utility maintains interconnections with the cities of Coral Springs and Tamarac.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	39,222	40,008	41,125	41,183
Average 2012-2016 Per Capita (gallons per day finished water)	109			
Potable Water Demands (daily average annual finished water in mgd)	**4.28**	**4.36**	**4.48**	**4.49**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00100-W (expires 2030)			
SAS	5.42			
FAS	0.00			
Total Allocation	**5.42**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060291)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	7.40	7.40	7.40	7.40
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**7.40**	**7.40**	**7.40**	**7.40**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	0.00	0.00	0.00	0.00

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

CITY OF DANIA BEACH

Service Area: A portion of the City of Dania Beach

Description: The SAS wellfield is no longer in service due to water quality issues resulting from saltwater intrusion. Purchased raw water is treated at one WTP using lime softening and nanofiltration. As of 2017, the BCWWS-SRW will provide all of the City of Dania Beach's raw water demand until 2023, and the City has an agreement for 1.00 mgd of C-51 Reservoir storage to offset additional raw water withdrawals. The City will need to develop an alternative water source by 2023 to meet future demands. The City maintains an interconnection with the City of Hollywood.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	16,520	18,316	22,484	26,033
Average 2012-2016 Per Capita (gallons per day finished water)	119			
Potable Water Demands (daily average annual finished water in mgd)	**1.97**	**2.18**	**2.68**	**3.10**

SFWMD Water Use Permitted Allocation (mgd)	
Potable Water Source	Permit Number 06-00187-W (expires 2033)
SAS	1.10
FAS	0.00
Bulk Raw Water Purchase (from BCWWS-SRW)	(2.93)[a]
Total Allocation (not including bulk water purchase)	**1.10**

FDEP Potable Water Treatment Capacity (PWS ID # 4060253)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	5.02	5.02	5.02	5.02
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**5.02**	**5.02**	**5.02**	**5.02**
Nonpotable Alternative Water Source Capacity (mgd)				
Surface Water	0.00	0.00	1.00[b]	1.00[b]
Total Nonpotable Capacity	**0.00**	**0.00**	**1.00[b]**	**1.00[b]**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
Purchase bulk water from City Of Hollywood[b]	SAS/FAS	2023	N/A	0.00	1.00[b]	1.00[b]
Total Potable Water			**$0.00**	**0.00**	**1.00[b]**	**1.00[b]**
Nonpotable Water						
C-51 Reservoir Storage Phase 1[b]	Surface Water	2023	$4.60	0.00	1.00[b]	1.00[b]
Total Nonpotable Water			**$4.60**	**0.00**	**1.00[b]**	**1.00[b]**
Total New Water			**$4.60**	**0.00**	**2.00[b]**	**2.00[b]**

[a] As of 2018, the BCWWS-SRW will provide all of the City of Dania Beach's raw water demand until 2023, estimated to be 3.02 mgd. In order to achieve this, 0.31 mgd of the City's SAS allocation was transferred to the BCWWS-SRW. After 2023, the amount of bulk raw water provided by the BCWWS-SRW will be reduced to 1.58 mgd.

[b] The City of Dania Beach must implement project(s) or determine an alternative source(s) to meet 2023 to 2040 demands.

TOWN OF DAVIE

Service Area: A portion of the Town of Davie and the Seminole Tribe of Florida Hollywood Reservation

Description: Potable water supplies are obtained from two SAS wellfields and one FAS wellfield. SAS water is treated at two WTPs using lime softening. FAS water is treated at an RO WTP that became operational in 2013. The Town purchases bulk finished water from the City of Fort Lauderdale and sells bulk finished water to Tindall Hammock Irrigation and Soil Conservation District. The town maintains interconnections with the cities of Cooper City, Fort Lauderdale, Hollywood, and Sunrise and with the Seminole Tribe of Florida Hollywood Reservation.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	29,819	33,012	40,414	46,704
Bulk Population	14	192	641	1,068
Average 2012-2016 Per Capita (gallons per day finished water)	143[a]			
Potable Water Demands (daily average annual finished water in mgd)	**4.26**	**4.72**	**5.78**	**6.68**
Bulk Potable Water Demands (daily average annual finished water in mgd from City of Fort Lauderdale)	0.002	0.03	0.09	0.15
Total Potable Water Demands (daily average annual finished water in mgd)	**4.26**	**4.75**	**5.87**	**6.83**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00134-W (expires 2030)			
SAS	5.02			
FAS	14.83			
Bulk Raw Water (Finished Water Sale to Tindall Hammock Irrigation and Soil Conservation District)	(0.004-0.20)			
Total Allocation	**19.85**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060344)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	4.00	4.00	4.00	4.00
FAS	6.00	6.00	6.00	6.00
Total Potable Capacity	**10.00**	**10.00**	**10.00**	**10.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	3.50	3.50	3.50	3.50
Total Nonpotable Capacity	**3.50**	**3.50**	**3.50**	**3.50**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

[a] Per capita average does not include 2012 FDEP Monthly Operating Report data because the FAS WTP was not online in 2012.

CITY OF DEERFIELD BEACH

B R O W A R D

Service Area: City of Deerfield Beach

Description: Potable water supplies are obtained from two wellfields: the East wellfield withdraws from the SAS, and the West wellfield withdraws from the SAS and FAS. Water is treated at the West WTP using lime softening, nanofiltration, and RO (for brackish FAS water) treatment systems. The East WTP was decommissioned in 2012. The City purchases 0.59 mgd of raw water from the BCWWS District 2A/North Regional Wellfield. The City maintains interconnections with the City of Boca Raton,Town of Hillsboro Beach, and BCWWS.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	53,069	56,340	63,422	68,811
Average 2012-2016 Per Capita (gallons per day finished water)	185			
Potable Water Demands (daily average annual finished water in mgd)	**9.82**	**10.42**	**11.73**	**12.73**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00082-W (expires 2029)			
SAS	11.91			
FAS	4.00			
Bulk Water Purchase (from BCWWS District 2A/North Regional Wellfield)	(0.59)			
Total Allocation	**14.74**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060254)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	20.60	20.60	20.60	20.60
FAS	3.00	3.00	3.00	3.00
Total Potable Capacity	**23.60**	**23.60**	**23.60**	**23.60**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

CITY OF FORT LAUDERDALE

Service Area: Cities of Fort Lauderdale, Lauderdale Lakes, City of North Lauderdale, Oakland Park, and Wilton Manors; portions of the City of Dania Beach, City of Hollywood, City of Tamarac, City of Lauderhill; Port Everglades; towns of Lauderdale-By-The-Sea and Davie; and villages of Lazy Lake and Sea Ranch Lakes

Description: Potable water supplies are obtained from two SAS wellfields, and water is treated at two WTPs: Fiveash WTP uses lime softening and Peele-Dixie WTP uses nanofiltration. The City plans to expand the Peele-Dixie WTP and install FAS wells by 2030. The City sells finished bulk water to the Town of Davie and City of Tamarac. The City maintains interconnections with the BCWWS, Town of Dania Beach, Town of Davie, City of Plantation, and City of Pompano Beach.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	223,112	240,549	279,628	311,157
Average 2012-2016 Per Capita (gallons per day finished water)	170			
Potable Water Demands (daily average annual finished water in mgd)	**37.93**	**40.89**	**47.54**	**52.90**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00123-W (expires 2028)			
SAS	52.55			
FAS	8.64			
Bulk Raw Water (Finished Water Sale to Town of Davie)	(0.002-0.16)			
Bulk Raw Water (Finished Water Sale to City of Tamarac)	(0.17-0.24)			
Total Allocation	**61.19**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060486)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	90.00	90.00	90.00	90.00
FAS	0.00	0.00	6.00	6.00
Total Potable Capacity	**90.00**	**90.00**	**96.00**	**96.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
Dixie Floridan Water Supply/WTP	FAS	2030	$22.90	0.00	6.00	6.00
Total Potable Water			**$22.90**	**0.00**	**6.00**	**6.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$22.90**	**0.00**	**6.00**	**6.00**

B R O W A R D

CITY OF HALLANDALE BEACH

Service Area: City of Hallandale Beach

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening and nanofiltration. The two existing wells' allocation is capped at 3.50 mgd due to the risk of saltwater intrusion. The City purchases up to 3.50 mgd of raw water from the BCWWS-SRW, has an agreement for 1.00 mgd of C-51 Reservoir storage to offset additional raw water withdrawals, and is proposing one new SAS well. The City maintains interconnections with the cities of Hollywood and North Miami Beach.

<table>
<tr><th colspan="8">Population and Finished Water Demand</th></tr>
<tr><td colspan="4" rowspan="2"></td><td>Existing</td><td colspan="3">Projected</td></tr>
<tr><td>2016</td><td>2020</td><td>2030</td><td>2040</td></tr>
<tr><td colspan="4">Population</td><td>39,375</td><td>41,021</td><td>44,304</td><td>46,424</td></tr>
<tr><td colspan="4">Average 2012-2016 Per Capita (gallons per day finished water)</td><td colspan="4">148</td></tr>
<tr><td colspan="4">Potable Water Demands (daily average annual finished water in mgd)</td><td>5.83</td><td>6.07</td><td>6.56</td><td>6.87</td></tr>
<tr><th colspan="8">SFWMD Water Use Permitted Allocation (mgd)</th></tr>
<tr><td colspan="4">Potable Water Source</td><td colspan="4">Permit Number 06-00138-W (expires 2033)</td></tr>
<tr><td colspan="4">SAS</td><td colspan="4">4.03</td></tr>
<tr><td colspan="4">FAS</td><td colspan="4">0.00</td></tr>
<tr><td colspan="4">Bulk Raw Water Purchase (from BCWWS-SRW)</td><td colspan="4">(3.50)[a]</td></tr>
<tr><td colspan="4">Total Allocation (not including bulk water purchase)</td><td colspan="4">4.03</td></tr>
<tr><th colspan="8">FDEP Potable Water Treatment Capacity (PWS ID # 4060573)</th></tr>
<tr><td colspan="4" rowspan="3">Permitted Capacity by Source</td><td colspan="4">Cumulative Facility & Project Capacity (mgd)</td></tr>
<tr><td>Existing</td><td colspan="3">Projected</td></tr>
<tr><td>2016</td><td>2020</td><td>2030</td><td>2040</td></tr>
<tr><td colspan="4">SAS</td><td>16.00</td><td>16.00</td><td>16.00</td><td>16.00</td></tr>
<tr><td colspan="4">FAS</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr>
<tr><td colspan="4">Total Potable Capacity</td><td>16.00</td><td>16.00</td><td>16.00</td><td>16.00</td></tr>
<tr><th colspan="8">Nonpotable Alternative Water Source Capacity (mgd)</th></tr>
<tr><td colspan="4">Surface Water</td><td>0.00</td><td>0.00</td><td>1.00[c]</td><td>1.00[c]</td></tr>
<tr><td colspan="4">Total Nonpotable Capacity</td><td>0.00</td><td>0.00</td><td>1.00[c]</td><td>1.00[c]</td></tr>
<tr><th colspan="8">Project Summary</th></tr>
<tr><td rowspan="2">Water Supply Projects</td><td rowspan="2">Source</td><td rowspan="2">Completion Date</td><td rowspan="2">Total Capital Cost ($ million)</td><td colspan="4">Projected Cumulative Design Capacity (mgd)</td></tr>
<tr><td>2020</td><td colspan="2">2030</td><td>2040</td></tr>
<tr><th colspan="8">Potable Water</th></tr>
<tr><td>Well #9</td><td>SAS</td><td>2020</td><td>$1.80</td><td>3.03[b]</td><td colspan="2">3.03[b]</td><td>3.03[b]</td></tr>
<tr><td colspan="3">Total Potable Water</td><td>$1.80</td><td>3.03[b]</td><td colspan="2">3.03[b,c]</td><td>3.03[b,c]</td></tr>
<tr><th colspan="8">Nonpotable Water</th></tr>
<tr><td>C-51 Reservoir Storage Phase 1[c]</td><td>Surface Water</td><td>2023</td><td>$4.60</td><td>0.00</td><td colspan="2">1.00[c]</td><td>1.00[c]</td></tr>
<tr><td colspan="3">Total Nonpotable Water</td><td>$4.60</td><td>0.00</td><td colspan="2">1.00[c]</td><td>1.00[c]</td></tr>
<tr><td colspan="3">Total New Water</td><td>$6.40</td><td>3.03[b]</td><td colspan="2">4.03[b,c]</td><td>4.03[b,c]</td></tr>
</table>

[a] Between 2016 and 2023, the BCWWS-SRW will provide 3.50 mgd of raw water to the City of Hallandale Beach. From 2023 to 2040, the allocation will be reduced to 3.26 mgd.

[b] The City of Hallandale is working with SFWMD staff to permit Well #9 and modify a permit to increase its SAS allocation up to its base condition of 4.03 mgd. Well #9 will not increase potable water treatment capacity.

[c] The City of Hallandale Beach will implement its approved capacity allocation agreement for Phase 1 of the C-51 Reservoir.

TOWN OF HILLSBORO BEACH

Service Area: Town of Hillsboro Beach

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. The Town is replacing the water main to improve water distribution throughout the service area. The Town maintains interconnections with the BCWWS and City of Deerfield Beach.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	1,989	2,054	2,175	2,239
Average 2012-2016 Per Capita (gallons per day finished water)	327			
Potable Water Demands (daily average annual finished water in mgd)	**0.65**	**0.67**	**0.71**	**0.73**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00101-W (expires 2030)			
SAS	0.88			
FAS	0.00			
Total Allocation	**0.88**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060615)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	2.25	2.25	2.25	2.25
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**2.25**	**2.25**	**2.25**	**2.25**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

CITY OF HOLLYWOOD

Service Area: Cities of Hollywood and West Park, portions of the City of Dania Beach, Town of Davie, City of Fort Lauderdale, and Seminole Tribe of Florida Hollywood Reservation. The City of Hollywood provides treated water to Broward County Water and Wastewater Services to serve portions of unincorporated Broward County and bulk sales.

Description: Most potable water supplies are obtained from the SAS, and water is treated at three WTPs using lime softening, membrane filtration, and RO treatment processes. The City purchases bulk raw water from the BCWWS-SRW and provides treated (finished) water to to BCWWS District 3, which includes the cities of Pembroke Park and West Park, and the western portions of Dania Beach. The City also sells bulk finished water to the Seminole Tribe of Florida Hollywood Reservation. The City maintains interconnections with the cities of Dania Beach, Hallandale Beach, and Pembroke Pines.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population (City of Hollywood service area)	146,455	153,521	168,115	178,271
Bulk Population (BCWWS District 3 service area)	51,390	53,801	58,749	62,149
Total Population (City of Hollywood and bulk)	**197,845**	**207,322**	**226,864**	**240,420**
Average 2012-2016 Per Capita (gallons per day finished water)	112			
Potable Water Demands (daily average annual finished water in mgd)	**16.40**	**17.19**	**18.83**	**19.97**
Bulk Potable Water Demands (daily average annual finished water in mgd for BCWWS District 3)	5.76	6.03	6.58	6.96
Total Potable Water Demands (daily average annual finished water in mgd)	**22.16**	**23.22**	**25.41**	**26.93**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00038-W (expires 2028)			
SAS	24.80			
FAS	8.68			
Bulk Raw Water Purchase (from BCWWS-SRW)	5.90			
Bulk Raw Water (Finished Water Sale to Seminole Tribe of Florida)	(0.08-0.11)			
Total Allocation (including bulk water purchase)	**39.38**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060642)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	55.50	55.50	55.50	55.50
FAS	4.00	4.00	4.00	6.00
Total Potable Capacity	**59.50**	**59.50**	**59.50**	**61.50**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	3.00	3.00	7.80[a]	7.80[a]
Total Nonpotable Capacity	**3.00**	**3.00**	**7.80**	**7.80**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
RO Train E	FAS	2034	$2.00	0.00	0.00	2.00
FAS wells F14 and F15	FAS	2034	$3.00	0.00	0.00	4.00
Total Potable Water			**$5.00**	**0.00**	**0.00**	**6.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$5.00**	**0.00**	**0.00**	**6.00**

[a] Projection to meet Ocean Outfall Law requirements. To meet this capacity, the City has suggested several potential end users; see **Appendix F** for more information.

CITY OF LAUDERHILL

Service Area: City of Lauderhill

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. The City anticipates construction of FAS wells and an RO WTP to meet future demands. The City maintains interconnections with the BCWWS and the cities of Plantation, Sunrise, and Tamarac.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	61,857	63,931	67,797	69,896
Average 2012-2016 Per Capita (gallons per day finished water)	98			
Potable Water Demands (daily average annual finished water in mgd)	**6.06**	**6.27**	**6.64**	**6.85**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00129-W (expires 2030)			
SAS	7.70			
FAS	1.02			
Total Allocation	**8.72**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060787)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	16.00	16.00	16.00	16.00
FAS	0.00	0.00	3.00	3.00
Total Potable Capacity	**16.00**	**16.00**	**19.00**	**19.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	0.00	0.00	0.00	0.00

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
Well #9	SAS	2019	$1.00	5.50[a]	5.50[a]	5.50[a]
FAS well drilling equipping and testing (Phase 1)	FAS	2021	$2.50	0.00	3.00	3.00
Construction of RO facility (Phase 1)	FAS	2021	$20.00	0.00	1.00	1.00
FAS well drilling equipping and testing (Phase 2)	FAS	2024	$2.50	0.00	2.00	2.00
Construction of RO facility (Phase 2)	FAS	2025	$30.00	0.00	2.00	2.00
Total Potable Water			**$56.00**	**5.50[a]**	**13.50[a]**	**13.50[a]**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$56.00**	**5.50[a]**	**13.50[a]**	**13.50[a]**

[a] Well #9 will not increase potable water treatment capacity; it will replace an old well.

BROWARD

BROWARD

CITY OF MARGATE

Service Area: City of Margate and a portion of the City of Coconut Creek

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. The City maintains interconnections with the cities of North Lauderdale and Pompano Beach.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	61,868	64,790	70,796	74,936
Average 2012-2016 Per Capita (gallons per day finished water)	110			
Potable Water Demands (daily average annual finished water in mgd)	**6.81**	**7.13**	**7.79**	**8.24**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00121-W (expires 2025)			
SAS	9.30			
FAS	0.00			
Total Allocation	**9.30**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060845)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	13.50	13.50	13.50	13.50
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**13.50**	**13.50**	**13.50**	**13.50**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	0.00	0.00	0.00	0.00

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

CITY OF MIRAMAR

Service Area: City of Miramar

Description: Potable water supplies are obtained from an eastern SAS wellfield and a western SAS and FAS wellfield, each with its own WTP. The eastern WTP will be converting to nanofiltration (from lime softening) by 2019. The western WTP treats FAS water via RO and SAS water via nanofiltration. The City maintains interconnections with the BCWWS, City of Pembroke Pines, and MDWASD.

Population and Finished Water Demand							
				Existing	Projected		
				2016	2020	2030	2040
Population				122,845	128,105	138,662	145,576
Average 2012-2016 Per Capita (gallons per day finished water)				104			
Potable Water Demands (daily average annual finished water in mgd)				**12.78**	**13.32**	**14.42**	**15.14**
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 06-00054-W (expires 2036)			
SAS				15.15			
FAS				3.15			
Total Allocation				**18.30**[a]			
FDEP Potable Water Treatment Capacity (PWS ID # 4060925)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2016	2020	2030	2040
SAS				15.25	15.25	15.25	15.25
FAS				2.50	2.50	2.50	2.50
Total Potable Capacity				**17.75**	**17.75**	**17.75**	**17.75**
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				4.00	6.00	6.00	8.00[b]
Total Nonpotable Capacity				**4.00**	**6.00**	**6.00**	**8.00**[b]
Project Summary							
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)			
				2020	2030	2040	
Potable Water							
No Projects							
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**	
Nonpotable Water							
Reclaimed Water Treatment Expansion – Phase 2	Reclaimed Water	2020	$5.30	2.00	2.00	2.00	
Total Nonpotable Water			**$5.30**	**2.00**	**2.00**	**2.00**	
Total New Water			**$5.30**	**2.00**	**2.00**	**2.00**	

[a] The annual allocation may be increased to 18.87 mgd if the City of Miramar provides documentation that the minimum citywide average use of reclaimed water is 4.00 mgd.

[b] The City intends to continue expanding its water reuse system by adding customers, and plans to be reusing 6.00 to 8.00 mgd by 2040. This could lead to a decrease in the per capita and demand by 2040. The City is anticipating that the increased use of reclaimed water around the western wellfield will decrease the stress on traditional water sources and may yield substitution credits (or terminated base condition water use).

CITY OF NORTH LAUDERDALE

Service Area: City of North Lauderdale

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. The City maintains interconnections with the BCWWS and the cities of Margate and Tamarac.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	35,460	36,688	39,003	40,301
Average 2012-2016 Per Capita (gallons per day finished water)	80			
Potable Water Demands (daily average annual finished water in mgd)	**2.84**	**2.94**	**3.12**	**3.22**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00004-W (expires 2025)			
SAS	3.65			
FAS	0.00			
Total Allocation	**3.65**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060976)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	7.50	7.50	7.50	7.50
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**7.50**	**7.50**	**7.50**	**7.50**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

NORTH SPRINGS IMPROVEMENT DISTRICT

Service Area: A portion of the City of Coral Springs and the City of Parkland

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. The utility is proposing an FAS wellfield and RO WTP to meet future demand. The utility maintains an interconnection with the City of Coral Springs.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	36,879	38,817	42,891	45,829
Average 2012-2016 Per Capita (gallons per day finished water)	113			
Potable Water Demands (daily average annual finished water in mgd)	**4.17**	**4.39**	**4.85**	**5.18**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00274-W (expires 2030)			
SAS	5.18			
FAS	0.00[a]			
Total Allocation	**5.18**			
FDEP Potable Water Treatment Capacity (PWS ID # 4064390)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	6.80	6.80	6.80	6.80
FAS	0.00	0.00	0.00	2.50
Total Potable Capacity	**6.80**	**6.80**	**6.80**	**9.30**
Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water	0.00	4.00	4.00	4.00
Total Nonpotable Capacity	**0.00**	**4.00**	**4.00**	**4.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
FAS wells and RO WTP	FAS	2031	$4.00	0.00	0.00	2.50
Total Potable Water			**$4.00**	**0.00**	**0.00**	**2.50**
Nonpotable Water						
Water Reuse Plant	Reclaimed Water	2017	$25.00	4.00	4.00	4.00
Total Nonpotable Water			**$25.00**	**4.00**	**4.00**	**4.00**
Total New Water			**$29.00**	**4.00**	**4.00**	**6.50**

[a] North Springs Improvement District is working with SFWMD staff to modify their permit and obtain an FAS allocation.

PARKLAND UTILITIES, INC.

Service Area: City of Parkland

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. The utility maintains an interconnection with the PBCWUD.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	2,277	2,526	3,104	3,597
Average 2012-2016 Per Capita (gallons per day finished water)	103			
Potable Water Demands (daily average annual finished water in mgd)	**0.23**	**0.26**	**0.32**	**0.37**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00242-W (expires 2025)			
SAS	0.35			
FAS	0.00			
Total Allocation	**0.35**[a]			
FDEP Potable Water Treatment Capacity (PWS ID # 4061957)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	0.58	0.58	0.58	0.58
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.58**	**0.58**	**0.58**	**0.58**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

[a] Parkland Utilities is working with SFWMD regulatory staff to modify its permit and increase the SAS allocation to meet future needs. If an increased allocation is not permittable, the SFWMD suggests purchasing bulk water from the PBCWUD to meet 2040 demands.

CITY OF PEMBROKE PINES

Service Area: City of Pembroke Pines and a portion of the Town of Southwest Ranches

Description: Potable water supplies are obtained from two SAS wellfields, and water is treated at one WTP using lime softening. The utility maintains interconnections with the cities of Cooper City, Miramar, and Sunrise.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	161,337	164,152	167,682	166,913
Average 2012-2016 Per Capita (gallons per day finished water)	79			
Potable Water Demands (daily average annual finished water in mgd)	**12.75**	**12.97**	**13.25**	**13.19**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00135-W (expires 2030)			
SAS	15.60			
FAS	0.00			
Total Allocation	**15.60**			
FDEP Potable Water Treatment Capacity (PWS ID # 4061083)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	18.00	18.00	18.00	18.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**18.00**	**18.00**	**18.00**	**18.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

CITY OF PLANTATION

Service Area: City of Plantation

Description: Potable water supplies are obtained from two SAS wellfields, and water is treated at two WTPs using membrane filtration. The City maintains interconnections with the cities of Fort Lauderdale, Lauderhill, and Sunrise.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	89,674	93,283	100,408	104,900
Average 2012-2016 Per Capita (gallons per day finished water)	114			
Potable Water Demands (daily average annual finished water in mgd)	**10.22**	**10.63**	**11.45**	**11.96**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00103-W (expires 2024)			
SAS	17.24			
FAS	0.00			
Total Allocation	**17.24**			
FDEP Potable Water Treatment Capacity (PWS ID # 4061121)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	24.00	24.00	24.00	24.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**24.00**	**24.00**	**24.00**	**24.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	0.77	0.77	0.77	0.77
Total Nonpotable Capacity	**0.77**	**0.77**	**0.77**	**0.77**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

CITY OF POMPANO BEACH

Service Area: Cities of Pompano Beach and Lighthouse Point, and the Town of Lauderdale-By-The-Sea

Description: Potable water supplies are obtained from two SAS wellfields. The eastern wellfield has seasonal pumpage limits due to water quality issues caused by saltwater intrusion. Water is treated at one WTP using lime softening and nanofiltration. The City maintains interconnections with the BCWWS and City of Fort Lauderdale.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	84,524	91,552	107,422	120,381
Average 2012-2016 Per Capita (gallons per day finished water)	159			
Potable Water Demands (daily average annual finished water in mgd)	**13.44**	**14.56**	**17.08**	**19.14**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00070-W (expires 2025)			
SAS	17.75			
FAS	0.00			
Total Allocation	**17.75**			
FDEP Potable Water Treatment Capacity (PWS ID # 4061129)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	50.00	50.00	50.00	50.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**50.00**	**50.00**	**50.00**	**50.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	7.50	7.50	7.50	12.00[a]
Total Nonpotable Capacity	7.50	7.50	7.50	12.00[a]

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
Concentrate Treatment Study and Implementation	SAS	2021	$0.10	0.00	0.60	0.60
Total Potable Water			**$0.10**	**0.00**	**0.60**	**0.60**
Nonpotable Water						
Reuse Distribution Expansion Program through Fiscal Year 2025	Reclaimed Water	2025	$5.70	1.40[b]	2.20[b]	2.20[b]
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$5.80**	**0.00**	**0.60**	**0.60**

[a] The City intends to expand its water reuse system and add customers, with the goal of being 100 percent reuse by 2040. This should lead to a decrease in the per capita and demand. The permit is up for renewal in 2025, and the City will request an increase in their water use permit allocation, if needed.

[b] This project adds to the reclaimed water distribution system but does not increase the actual water reclamation facility's treatment capacity. However, the project will reduce potable water used for irrigation.

ROYAL UTILITY CORPORATION

Service Area: A portion of the City of Coral Springs

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. The utility maintains an interconnection with the City of Coral Springs.

B R O W A R D

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	3,431	3,520	3,669	3,722
Average 2012-2016 Per Capita (gallons per day finished water)	106			
Potable Water Demands (daily average annual finished water in mgd)	**0.36**	**0.37**	**0.39**	**0.39**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00003-W (expires 2026)			
SAS	0.48			
FAS	0.00			
Total Allocation	**0.48**			
FDEP Potable Water Treatment Capacity (PWS ID # 4061517)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	1.00	1.00	1.00	1.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**1.00**	**1.00**	**1.00**	**1.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

SEMINOLE TRIBE OF FLORIDA – HOLLYWOOD

Service Area: Seminole Tribe of Florida Hollywood Reservation

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using membrane filtration. The SFWMD does not issue a water use permit to the Seminole Tribe of Florida Hollywood Reservation. Rather, the Water Rights Compact Among the Seminole Tribe of Florida, the State of Florida and the South Florida Water Management District provides similar criteria authorized through an annual work plan. The Seminole Tribe of Florida also purchases bulk water from the City of Hollywood.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	1,258	1,635	2,559	3,407
Bulk Population (served by City of Hollywood)	469	501	572	627
Average 2012-2016 Per Capita (gallons per day finished water)	174			
Potable Water Demands (daily average annual finished water in mgd)	**0.22**	**0.28**	**0.45**	**0.59**
Bulk Potable Water Demands (daily average annual finished water in mgd from City of Hollywood)	(0.08)	(0.09)	(0.10)	(0.11)
Total Potable Water Demands (daily average annual finished water in mgd)	**0.22**	**0.28**	**0.45**	**0.59**

SFWMD Water Use Rights (mgd)	
Potable Water Source	7th Amendment to the 28th Annual Work Plan
SAS	0.53
FAS	0.00
Total Allocation	**0.53**

FDEP Potable Water Treatment Capacity				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	2.00	2.00	2.00	2.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**2.00**	**2.00**	**2.00**	**2.00**

Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	0.00	0.00	0.00	0.00

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
		Total Potable Water	**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
		Total Nonpotable Water	**$0.00**	**0.00**	**0.00**	**0.00**
		Total New Water	**$0.00**	**0.00**	**0.00**	**0.00**

CITY OF SUNRISE

Service Area: Cities of Sunrise and Weston, Town of Southwest Ranches, a portion of the Town of Davie, and unincorporated Broward County

Description: Potable water supplies are obtained from four SAS and FAS wellfields, and water is treated at three WTPs using lime softening and membrane filtration. In 2013, the City added an RO treatment system at the Springtree WTP. In 2019, the City plans to convert an FAS well to an ASR well to store potable SAS water. The City maintains interconnections with the cities of Cooper City, Lauderhill, Plantation, and Pembroke Pines as well as the Town of Davie.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	224,042	231,288	244,619	251,584
Average 2012-2016 Per Capita (gallons per day finished water)	98			
Potable Water Demands (daily average annual finished water in mgd)	**21.96**	**22.67**	**23.97**	**24.66**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00120-W (expires 2028)			
SAS	29.09			
FAS	10.98			
Total Allocation	**40.07**			
FDEP Potable Water Treatment Capacity (PWS ID # 4061410/4061408)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	50.00	50.00	50.00	50.00
FAS	1.50	1.50	1.50	1.50
Total Potable Capacity	**51.50**	**51.50**	**51.50**	**51.50**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	0.80	4.80	4.80	4.80
Surface Water	0.00	0.00	5.00	5.00
Total Nonpotable Capacity	**0.80**	**4.80**	**9.80**	**9.80**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
SGF-1 ASR Conversion	SAS	2019	$7.62	3.00	3.00	3.00
Total Potable Water			**$7.62**	**3.00**	**3.00**	**3.00**
Nonpotable Water						
Sawgrass WWTF high-level disinfection and reuse improvements (Phase I)	Reclaimed Water	2017	$17.94	4.00	4.00	4.00
Reuse distribution system for Sawgrass WWTF (Phases II and III)	Reclaimed Water	2018-2022	$21.14	0.00[a]	0.00[a]	0.00[a]
C-51 Reservoir Storage Phase 1	Surface Water	2020	$23.00	0.00	5.00	5.00
Total Nonpotable Water			**$62.08**	**4.00**	**9.00**	**9.00**
Total New Water			**$69.70**	**7.00**	**12.00**	**12.00**

[a] This project adds capacity to the reclaimed water distribution system but does not increase the actual treatment capacity. See **Appendix F** for more information.

CITY OF TAMARAC

Service Area: City of Tamarac and portions of the City of North Lauderdale

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. The City maintains interconnections with the BCWWS and the cities of Coral Springs, Fort Lauderdale, and North Lauderdale.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	61,083	63,099	66,837	68,835
Bulk Population	2,296	2,216	1,963	1,663
Average 2012-2016 Per Capita (gallons per day finished water)	98			
Potable Water Demands (daily average annual finished water in mgd)	**5.99**	**6.18**	**6.55**	**6.75**
Bulk Potable Water Demands (daily average annual finished water in mgd from City of Fort Lauderdale)	0.23	0.22	0.19	0.16
Total Potable Water Demands (daily average annual finished water in mgd)	**6.22**	**6.40**	**6.74**	**6.91**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00071-W (expires 2034)			
SAS	7.58			
FAS	0.00			
Total Allocation	**7.58**			
FDEP Potable Water Treatment Capacity (PWS ID # 4061429)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	16.00	16.00	16.00	16.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**16.00**	**16.00**	**16.00**	**16.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

TINDALL HAMMOCK IRRIGATION AND SOIL CONSERVATION DISTRICT

Service Area: Town of Davie

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. The utility purchases bulk water from the Town of Davie.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	2,798	2,949	3,269	3,502
Bulk Population	25	111	326	530
Average 2012-2016 Per Capita (gallons per day finished water)	129			
Potable Water Demands (daily average annual finished water in mgd)	**0.36**	**0.38**	**0.42**	**0.45**
Bulk Potable Water Demands (daily average annual finished water in mgd from Town of Davie)	0.003	0.01	0.04	0.07
Total Potable Water Demands (daily average annual finished water in mgd)	**0.363**	**0.39**	**0.46**	**0.52**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 06-00170-W (expires 2026)			
SAS	0.74			
FAS	0.00			
Total Allocation	**0.74**			
FDEP Potable Water Treatment Capacity (PWS ID # 4060419)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	1.00	1.00	1.00	1.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**1.00**	**1.00**	**1.00**	**1.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	0.60	0.60	0.60	0.60
Total Nonpotable Capacity	**0.60**	**0.60**	**0.60**	**0.60**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

MIAMI-DADE COUNTY

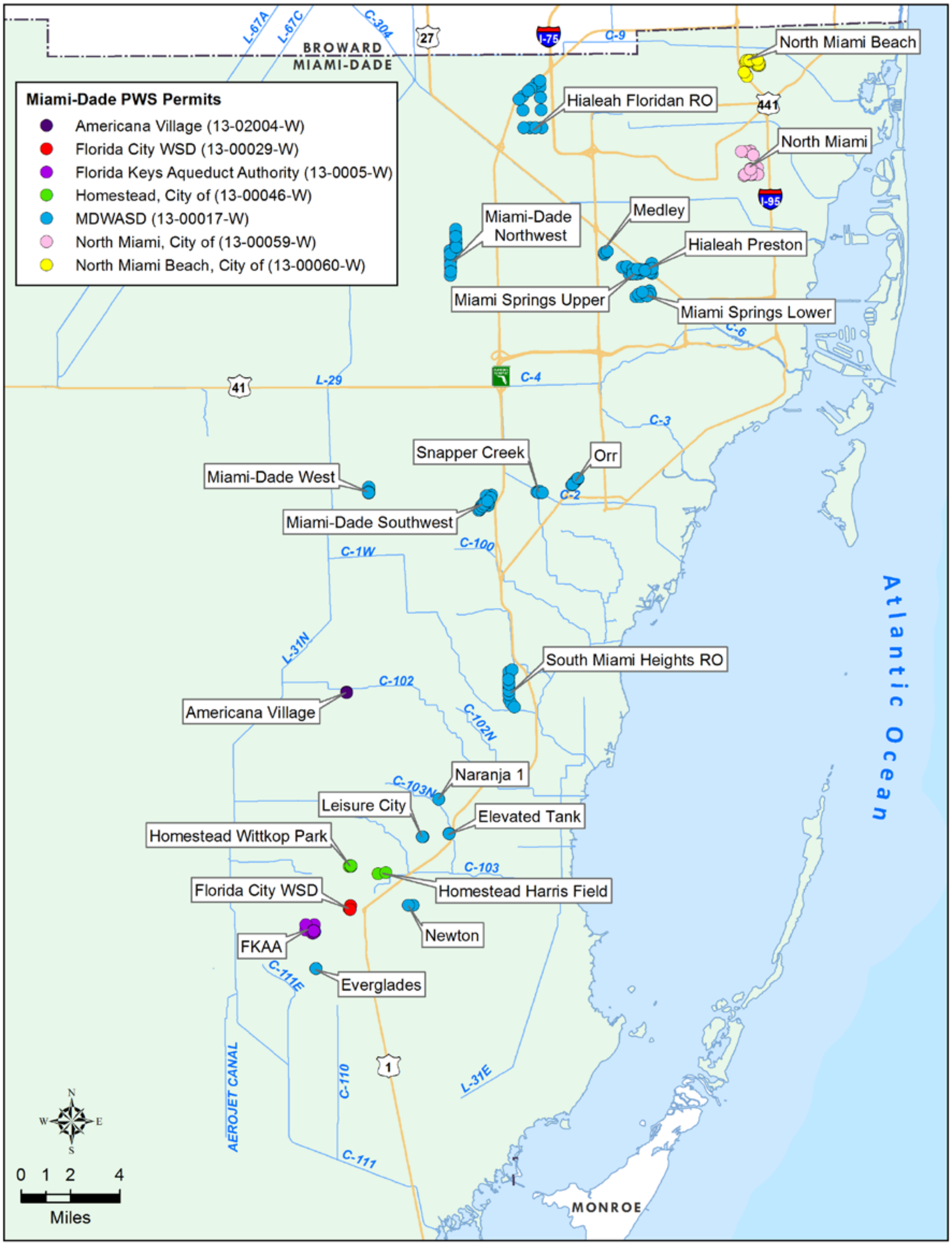

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Figure E-3. Existing Public Water Supply wellfields in Miami-Dade County. (Note: Monroe County is served solely by the Florida Keys Aqueduct Authority, whose wellfield is located in Miami-Dade County.)

AMERICANA VILLAGE

Service Area: Mobile home community in unincorporated area of Miami-Dade County

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	1,583	1,583	1,583	1,583
Average 2012-2016 Per Capita (gallons per day finished water)	142			
Potable Water Demands (daily average annual finished water in mgd)	**0.22**	**0.22**	**0.22**	**0.22**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 13-02004-W (expires 2029)			
SAS	0.26			
FAS	0.00			
Total Allocation	**0.26**			
FDEP Potable Water Treatment Capacity (PWS ID # 4131403)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	0.50	0.50	0.50	0.50
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**0.50**	**0.50**	**0.50**	**0.50**
SFWMD Water Use Permitted Allocation (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

FLORIDA CITY WATER AND SEWER DEPARTMENT

Service Area: City of Florida City

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using chlorination. The City plans to reduce the high rate of water loss and per capita use rates to 143 by 2020 through leak detection and repair projects as well as improvements in auditing and other conservation measurements. The City has begun discussions with the City of Homestead and Florida Keys Aqueduct Authority to develop emergency interconnections.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	12,172	14,492	20,127	25,340
Average 2012-2016 Per Capita (gallons per day finished water)	167			
Potable Water Demands (daily average annual finished water in mgd)	**2.03**	**2.42**	**3.36**	**4.23**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 13-00029-W (expires 2034)			
SAS	2.08			
FAS	0.00			
Total Allocation	**2.08[a]**			
FDEP Potable Water Treatment Capacity (PWS ID # 4130255)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	4.00	4.00	4.00	4.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**4.00**	**4.00**	**4.00**	**4.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
Construct interconnection with FKAA or City of Homestead and purchase bulk water[b]	SAS	2020	NA	1.00[b]	1.50[b]	2.50[b]
Total Potable Water			**$0.00**	**1.00[b]**	**1.50[b]**	**2.50[b]**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**1.00[b]**	**1.50[b]**	**2.50[b]**

[a] Allocation is 2.08 mgd through June 30, 2020, then it decreases to 2.00 mgd from July 1, 2020 through permit expiration.

[b] This project is suggested by the SFWMD in order for the Florida City Water and Sewer Department to have adequate water supply to meet 2020 to 2040 demands. The Florida City Water and Sewer Department can choose to implement this project or determine an alternative source to meet 2020 to 2040 demands.

CITY OF HOMESTEAD

Service Area: Cities of Homestead and Florida City, and unincorporated areas of Miami-Dade County

Description: Potable water supplies are obtained from two SAS wellfields, each with its own lime softening WTP. Up to 3.00 mgd of bulk finished water is purchased from the MDWASD. The City's allocation depends on maintaining an aquifer recharge system using reclaimed water. The City plans to increase reclaimed water use, which may lead to a decrease in future per capita use rates. The City maintains an interconnection with the MDWASD.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	**68,939**	**75,072**	**89,345**	**101,838**
Average 2012-2016 Per Capita (gallons per day finished water)	156			
Potable Water Demands (daily average annual finished water in mgd)	**10.75**	**11.71**	**13.94**	**15.89**
Bulk Potable Water Demands (daily average annual finished water in mgd from MDWASD)	(3.00)	(3.00)	(3.00)	(3.00)
Total Potable Water Demands (daily average annual finished water in mgd)	**10.75**	**11.71**	**13.94**	**15.89**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 13-00046-W (expires 2026)			
SAS	10.55			
FAS	0.00			
Total Allocation	**10.55**			
FDEP Potable Water Treatment Capacity (PWS ID # 4130645)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	19.20	19.20	19.20	19.20
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**19.20**	**19.20**	**19.20**	**19.20**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	4.50	4.50	8.00	10.00[a]
Total Nonpotable Capacity	**4.50**	**4.50**	**8.00**	**10.00[a]**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
Purchase additional bulk water from MDWASD[b]	SAS	2030	ND	0.00	1.00	2.50
Total Potable Water			**$0.00**	**0.00**	**1.00**	**2.50**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**100**	**2.50**

[a] Projected reclaimed capacity is 10.00 mgd by 2040. The City of Homestead is developing projects to reach that capacity.

[b] This project is suggested by the SFWMD in order for the City of Homestead to have adequate water supply to meet 2030 to 2040 demands. The City can choose to implement this project or determine an alternative source to meet 2030 to 2040 demands.

MIAMI-DADE WATER AND SEWER DEPARTMENT

Service Area: Cities of Aventura, Coral Gables, Doral, Florida City, Hialeah*, Hialeah Gardens*, Homestead*, Miami, Miami Beach*, Miami Gardens, Miami Springs, North Bay Village*, North Miami*, North Miami Beach, Opa-Locka*, South Miami, Sweetwater, and West Miami*; towns of Bay Harbor Islands*, Cutler Bay, Medley*, Miami Lakes, and Surfside*; villages of Bal Harbour*, El Portal, Indian Creek*, Key Biscayne, Miami Shores, Palmetto Bay, Pinecrest, and Virginia Gardens*; and unincorporated areas of Miami-Dade County

**Wholesale customers of MDWASD. Municipalities without an asterisk are considered retail customers, and MDWASD handles the distribution and billing.*

Description: The MDWASD is the largest water and sewer utility in Florida. Potable water supplies are obtained from 15 SAS and FAS wellfields. The North system includes six wellfields and two WTPs (Hialeah and John E. Preston), which treat SAS water using lime softening and FAS using RO (Hialeah). The Central system includes four wellfields and one WTP (Alexander Orr Jr.), which treats water using lime softening. The South system consists of five wellfields, each with its own WTP that treats water using chlorination only. The MDWASD sells bulk finished water to the City of Homestead, the City of North Miami, and the Port of Miami. MDWASD has a goal-based conservation plan that is expected to generate 5.98 mgd in water savings between 2016 and 2040. The MDWASD maintains interconnections with the cities of Homestead, Miramar, North Miami, and North Miami Beach.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population[a]	2,351,064	2,487,983	2,792,869	3,043,340
Average 2012-2016 Per Capita (gallons per day finished water)	133			
Potable Water Demands (daily average annual finished water in mgd)	**312.69**	**330.90**	**371.45**	**404.76**
Bulk Potable Water Demands (daily average annual finished water in mgd delivered directly to City of Homestead)	3.00	3.00	3.00	3.00
Bulk Potable Water Demands (daily average annual finished water in mgd delivered directly to Port of Miami)	0.00	5.00	5.00	5.00
Potable Water Demands (daily average annual finished water in mgd)	315.69	338.90	379.45	412.76
Goal-Based Conservation Plan	**0.00**	**(-0.78)**	**(-3.38)**	**(-5.98)**
Total Potable Water Demands (daily average annual finished water in mgd)	**315.69**	**338.12**	**376.07**	**406.78**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 13-00017-W (expires 2035)			
SAS	349.50			
FAS	36.60			
Total Allocation	**386.07**			
FDEP Potable Water Treatment Capacity (PWS ID # 4130871/4131202/4130604)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	453.93	453.93	456.48	456.48
FAS	7.50	10.00	27.45	27.45
Total Potable Capacity	**461.43**	**463.93**	**483.93**	**493.93**
Nonpotable Water Treatment Capacity (mgd)				
Reclaimed Water[b]	16.49	16.49	165.49	165.49
ASR	0.00	0.00	0.00	0.00
Total Nonpotable Capacity	**16.49**	**16.49**	**165.49**	**165.49**

M I A M I - D A D E

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
Hialeah FAS RO WTP – Phase 1b	FAS	2018	$4.00	2.50	2.50	2.50
South Miami Heights WTP – Phase 1	FAS and SAS (2.55 mgd)	2021	$289.25	0.00	15.00	15.00
South Miami Heights WTP – Phase 2	FAS	2029	$8.00	0.00	5.00	5.00
South Dade Regional Wellfield (10 mgd)	SAS	2031	$20.00	0.00	0.00	10.00
SAS Facilities Optimization	SAS	N/A	N/A	0.00	0.00[d]	0.00[d]
			Total Potable Water	**$321.25**	**2.50**	**22.50**	**32.50**
Nonpotable Water						
Reclaimed water for FPL Turkey Point	Reclaimed Water	2025	ND	0.00	60.00	60.00
Biscayne Bay Coastal Wetlands Rehydration[c]	Reclaimed Water	2030	$1,120.00	0.00	89.00[c]	89.00[c]
Total Nonpotable Water			**$1,218.00**	**0.00**	**149.00[c]**	**149.00[c]**
Total New Water			**$1,421.25**	**2.50**	**171.50**	**181.50**

[a] Includes the City of North Miami bulk population.
[b] Includes implementation of reuse for compliance with the Ocean Outfall Law. See **Appendix F** for more information.
[c] Feasibility of this project will be determined at a later date.
[d] This project will not increase potable water treatment capacity; it will optimize the SAS facility's production to meet 2040 demands. MDWASD and the USGS have developed an extensive, peer-reviewed integrated surface water/groundwater model. In addition, MDWASD has developed optimization tools in conjunction with the model to maximize use of wet and dry season non-regional flows throughout Miami-Dade County. These optimization tools incorporate operational flexibility between the utility's water treatment plants and wellfields. By optimizing pumping and other strategies, MDWASD should be able to maximize the use of water resources to meet demands through 2040.

CITY OF NORTH MIAMI

Service Area: City of North Miami, Village of Biscayne Park, Village of Miami Shores, and unincorporated areas of Miami-Dade County

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. The City purchases bulk water from the MDWASD, which accounts for approximately 25 percent of the City's demand. The City maintains interconnections with the MDWASD and City of North Miami Beach.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	75,725	76,714	77,921	77,672
Bulk Population	22,583	25,150	31,229	36,678
Average 2012-2016 Per Capita (gallons per day finished water)	102			
Potable Water Demands (daily average annual finished water in mgd)	**7.72**	**7.82**	**7.95**	**7.92**
Bulk Potable Water Demands (daily average annual finished water in mgd from MDWASD)	2.30	2.57	3.19	3.74
Total Potable Water Demand (daily average annual finished water in mgd)	**10.02**	**10.39**	**11.14**	**11.66**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 13-00059-W (expires 2030)			
SAS	9.30			
FAS	7.97			
Total Allocation	**17.27**			
FDEP Potable Water Treatment Capacity (PWS ID # 4130977)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	9.30	9.30	9.30	9.30
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**9.30**	**9.30**	**9.30**	**9.30**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

CITY OF NORTH MIAMI BEACH

Service Area: Cities of North Miami Beach, Aventura, Miami Gardens, and Sunny Isles Beach; Town of Golden Beach; and unincorporated areas of Miami-Dade County

Description: Potable water supplies are obtained from one SAS and FAS wellfield, and water is treated at one WTP using lime softening, nanofiltration, or RO. The City maintains interconnections with the City of Hallandale Beach, MDWASD, and City of North Miami.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	169,946	178,852	198,396	214,092
Average 2012-2016 Per Capita (gallons per day finished water)	116			
Potable Water Demands (daily average annual finished water in mgd)	**19.71**	**20.75**	**23.01**	**24.83**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 13-00060-W (expires 2027)			
SAS	26.31			
FAS	12.07			
Total Allocation	**38.38**			
FDEP Potable Water Treatment Capacity (PWS ID # 4131618)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	25.50	25.50	25.50	25.50
FAS	6.50	9.50	14.50	14.50
Total Potable Capacity	**32.00**	**35.00**	**40.00**	**40.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	**0.00**	**0.00**	**0.00**	**0.00**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
FAS wells, lines, mains, and RO WTP (Norwood WTP) – Phase I	FAS	2019	$8.21	3.00	3.00	3.00
FAS wells, lines, mains, and RO WTP (Norwood WTP) – Phase II	FAS	2030	$37.50	0.00	5.00	5.00
Total Potable Water			**$45.71**	**3.00**	**8.00**	**8.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$45.71**	**3.00**	**8.00**	**8.00**

FLORIDA KEYS AQUEDUCT AUTHORITY

Service Area: Cities of Key Colony Beach, Key West, Layton, and Marathon; Islamorada, Village of Islands; and unincorporated areas of Monroe County. The FKAA also has a contract to provide up to 2.40 mgd to the United States Navy.

Description: Potable water supplies are obtained from one SAS wellfield and one FAS wellfield, and water is treated at two WTPs using lime softening and RO, respectively. FKAA also has two seawater desalination plants capable of producing up to 3.00 mgd of potable water from seawater, which are used for emergencies and extreme peaks in demand. The seasonal population in Monroe County exceeds the permanent population on an annual basis. Data from Monroe County and FKAA indicate the growing seasonal population is increasing per capita use rates.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population (permanent)	76,047	76,200	76,900	77,100
Average 2012-2016 Per Capita (gallons per day finished water)	231			
Potable Water Demands (daily average annual finished water in mgd)	**17.58**	**17.62**	**17.78**	**17.83**
SFWMD Water Use Permitted Allocation (mgd)				
Potable Water Source	Permit Number 13-00005-W (expires 2028)			
SAS	17.79[a]			
FAS	9.70[b]			
Total Allocation	**23.97**			
FDEP Potable Water Treatment Capacity (PWS ID # 4134357)				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	23.80	23.80	23.80	23.80
FAS	6.00	6.00	6.00	6.00
Total Potable Capacity	**29.80**	**29.80**	**29.80**	**29.80**
Nonpotable Alternative Water Source Capacity (mgd)				
Reclaimed Water	1.28	1.28	1.28	1.76
Total Nonpotable Capacity	**1.28**	**1.28**	**1.28**	**1.76**

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

[a] If the water level in United States Geological Survey well G-613 falls below 1.25 feet National Geodetic Vertical Datum of 1929 (December 1 to April 30 of each dry season), the allocation is reduced to 17.00 mgd to ensure consistency with the Everglades Minimum Flow and Minimum Water Level criteria.

[b] This is not a source limit.

SEMINOLE TRIBE OF FLORIDA – BIG CYPRESS

Service Area: Seminole Tribe of Florida Big Cypress Reservation

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening. The SFWMD does not issue a water use permit to the Seminole Tribe of Florida Big Cypress Reservation. Rather, the Water Rights Compact Among the Seminole Tribe of Florida, the State of Florida and the South Florida Water Management District provides similar criteria authorized through an annual work plan. The utility allocation is based on information in the first annual work plan.

Population and Finished Water Demand				
	Existing	Projected		
	2016	2020	2030	2040
Population	529	519	542	556
Average 2012-2016 Per Capita (gallons per day finished water)	234			
Potable Water Demands (daily average annual finished water in mgd)	**0.12**	**0.12**	**0.13**	**0.13**
SFWMD Water Use Rights (mgd)				
Potable Water Source	1st and 15th Annual Work Plan			
SAS	0.17			
FAS	0.00			
Total Allocation	**0.17**			
FDEP Potable Water Treatment Capacity				
Permitted Capacity by Source	Cumulative Facility & Project Capacity (mgd)			
	Existing	Projected		
	2016	2020	2030	2040
SAS	2.00	2.00	2.00	2.00
FAS	0.00	0.00	0.00	0.00
Total Potable Capacity	**2.00**	**2.00**	**2.00**	**2.00**
Nonpotable Alternative Water Source Capacity (mgd)				
Total Nonpotable Capacity	0.00	0.00	0.00	0.00

Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost ($ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
Total Potable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Nonpotable Water						
No Projects						
Total Nonpotable Water			**$0.00**	**0.00**	**0.00**	**0.00**
Total New Water			**$0.00**	**0.00**	**0.00**	**0.00**

REFERENCES

FDEP. 2017. *Water Resource Protection Programs.* Florida Department of Environmental Protection, Tallahassee, FL. Available from: http://www.dep.state.fl.us/water/.

F

Wastewater Treatment Facilities

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In South Florida, wastewater is treated through domestic wastewater treatment facilities (WWTFs) and septic tanks. This appendix focuses on the WWTFs in the Lower East Coast (LEC) Planning Area with capacities of 0.1 million gallons per day (mgd) or greater, some of which have associated reclaimed water distribution pipelines (**Figures F-1** through **F-3**). These WWTFs produce sufficient reclaimed water volumes to positively affect water resources in the area. In 2016, there were 46 WWTFs in the LEC Planning Area, 24 of which were reusing at least part of their wastewater (Florida Department of Environmental Protection [FDEP] 2017). The primary use of reclaimed water at some WWTFs is in-facility processes (e.g., filter backwashing).

Tables F-1 through **F-4** show 2016 and projected 2040 wastewater flow and reuse data, by county, from 48 WWTFs (46 existing in 2016, 1 began operating soon after 2016, and 1 is planned to be operational before 2040). Substantial increases in treated wastewater and water reuse flows are expected by 2040. Information on existing (2016) WWTFs was obtained from the *2016 Reuse Inventory* (FDEP 2017), which is a compilation of wastewater and reuse data from October 1, 2015 through September 30, 2016 provided to the FDEP in annual reuse reports submitted by wastewater utilities. Information for the 2040 projections was obtained primarily through communication with utilities. If 2040 projections were not available from a utility, 2016 wastewater flows were adjusted based on potable water flow projections, which are proportional to population.

Tables F-5 through **F-8** show WWTF flows and reuse percentages for the different disposal methods and reuse types. In 2016, public access irrigation (e.g., golf courses, parks, schools) was the primary means of water reuse in the LEC Planning Area. By 2040, cooling water for power plants or groundwater recharge could increase significantly and account for notable portions of water reuse in the region. For treated wastewater that was not reused, the primary means of disposal (in terms of flow) in 2016 was deep well injection, followed by ocean outfall.

> INFO ⓘ
>
> **Reuse Percentage**
>
> The term "reuse percentage" frequently is used when describing reuse facilities and is intended to reflect the amount of water reused when compared to the amount of wastewater treatment.

In 2008, Chapter 2008-232, Laws of Florida, established the Leah Schad Memorial Ocean Outfall Program, also called the Ocean Outfall Law. As part of the legislation, Section 403.086(9), Florida Statutes (F.S.), requires the elimination of the use of six ocean outfalls in southeastern Florida as a primary means for disposal of treated domestic wastewater and the reuse of at least 60 percent of the outfall flows by 2025. The objectives of this statute are to reduce nutrient loadings to the environment and achieve the more efficient use of water to meet water supply needs. By 2040, treated wastewater not reused will be disposed predominantly through deep well injection, with ocean outfalls used only for peak flow backup discharges. The following facilities were affected by the Ocean Outfall Law, and their 60 percent reuse flow requirement is provided:

- Boca Raton – 6.20 mgd
- South Central Regional – 7.70 mgd
- Broward County North Regional – 21.45 mgd
- Cooper City – 0.90 mgd
- Davie – 1.10 mgd
- Hollywood Southern Regional – 10.00 mgd
- Miami-Dade Water and Sewer Department (North, Central, and South) – 117.50 mgd

The total capacity of the WWTFs in the LEC Planning Area is 900 mgd; however, the average daily wastewater flow in 2016 was 661 mgd. While this is below the total capacity, a treatment capacity buffer is necessary to ensure a margin of safety in meeting daily peak flows. Regionally, 101 mgd (15 percent) of treated wastewater were reused. Most of the treated wastewater was reused for public access irrigation (51 mgd), primarily in Palm Beach County. Groundwater recharge through percolation ponds accounted for 5 mgd, and other uses (in-facility processes, wetland hydration) accounted for 44 mgd. Treated wastewater not reused was disposed of through deep well injection (363 mgd), ocean outfall (213 mgd), or shallow well injection (3 mgd). Any difference between wastewater flow at the treatment facility and effluent from the facility is largely due to the addition of post-treatment supplemental water (e.g., concentrate) or in-facility processes that lead to double counting of flow.

From 2016 to 2040, average daily wastewater flows are projected to increase 23 percent in the LEC Planning Area. Average daily reuse flows are projected to increase from about 101 mgd in 2016 to 297 mgd by 2040. The substantial increase in projected water reuse is primarily due to the utilities with ocean outfalls that must meet the 60 percent reuse requirement by 2025.

Reclaimed Water System

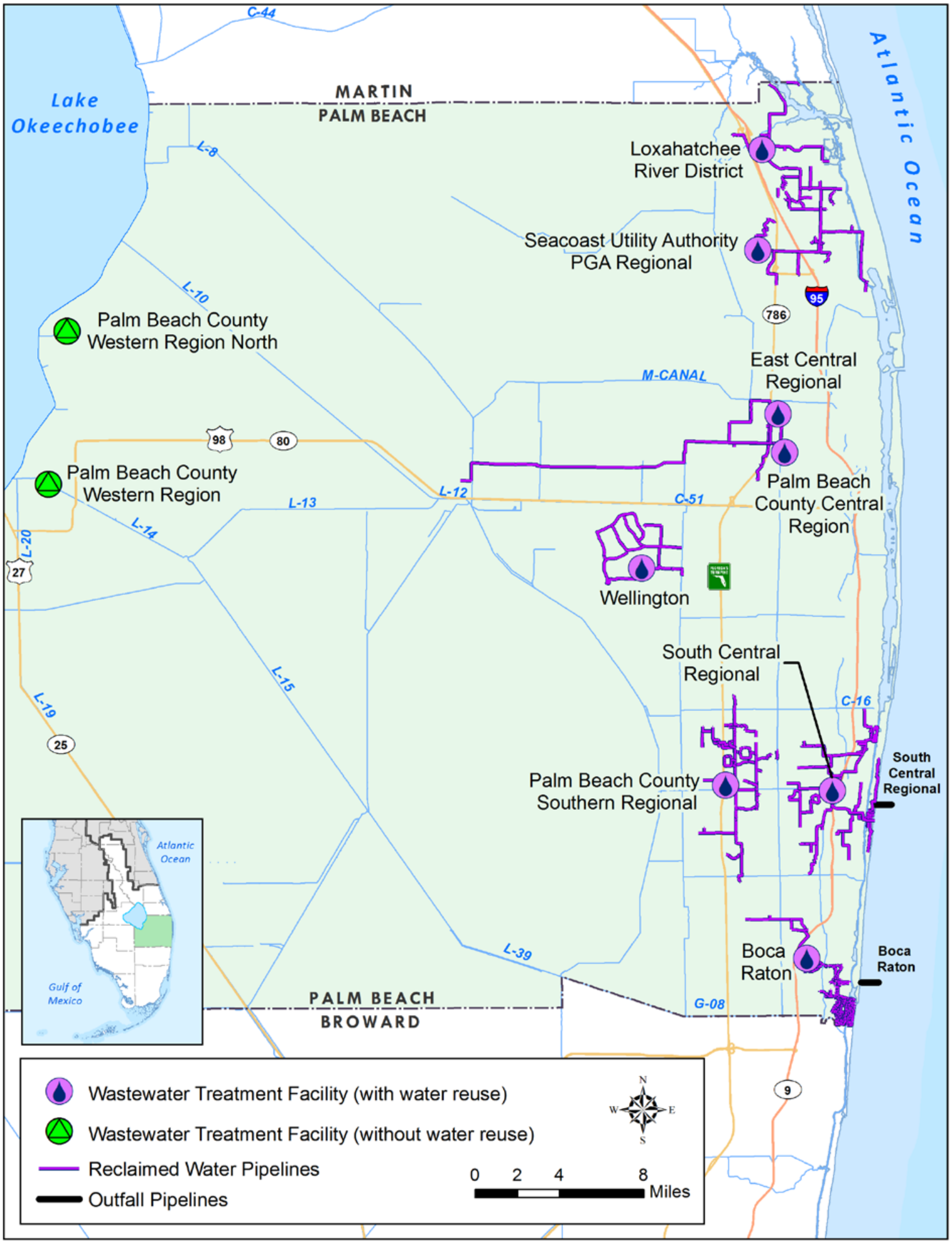


Figure F-1. Wastewater and reuse facilities in Palm Beach County.

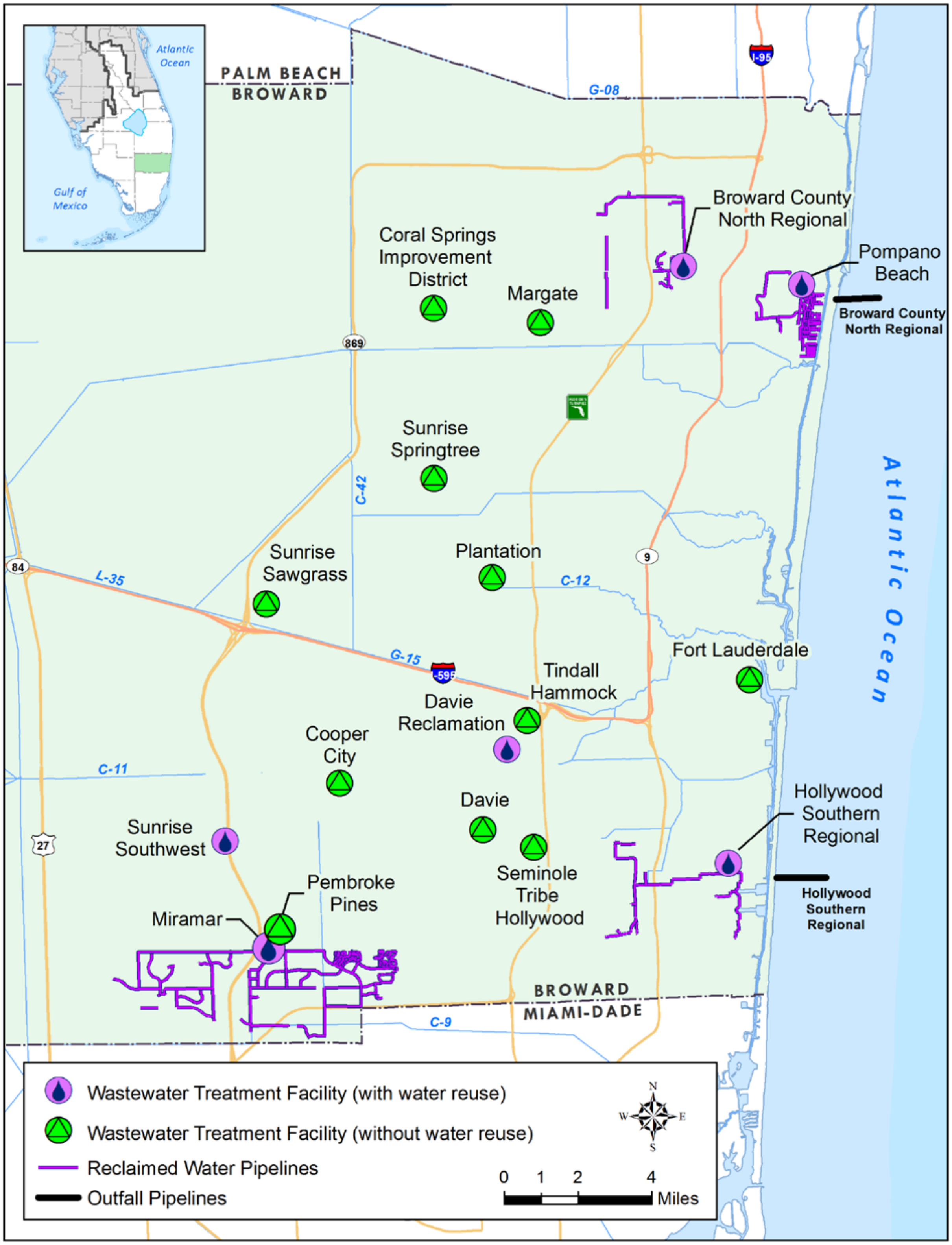


Figure F-2. Wastewater and reuse facilities in Broward County.

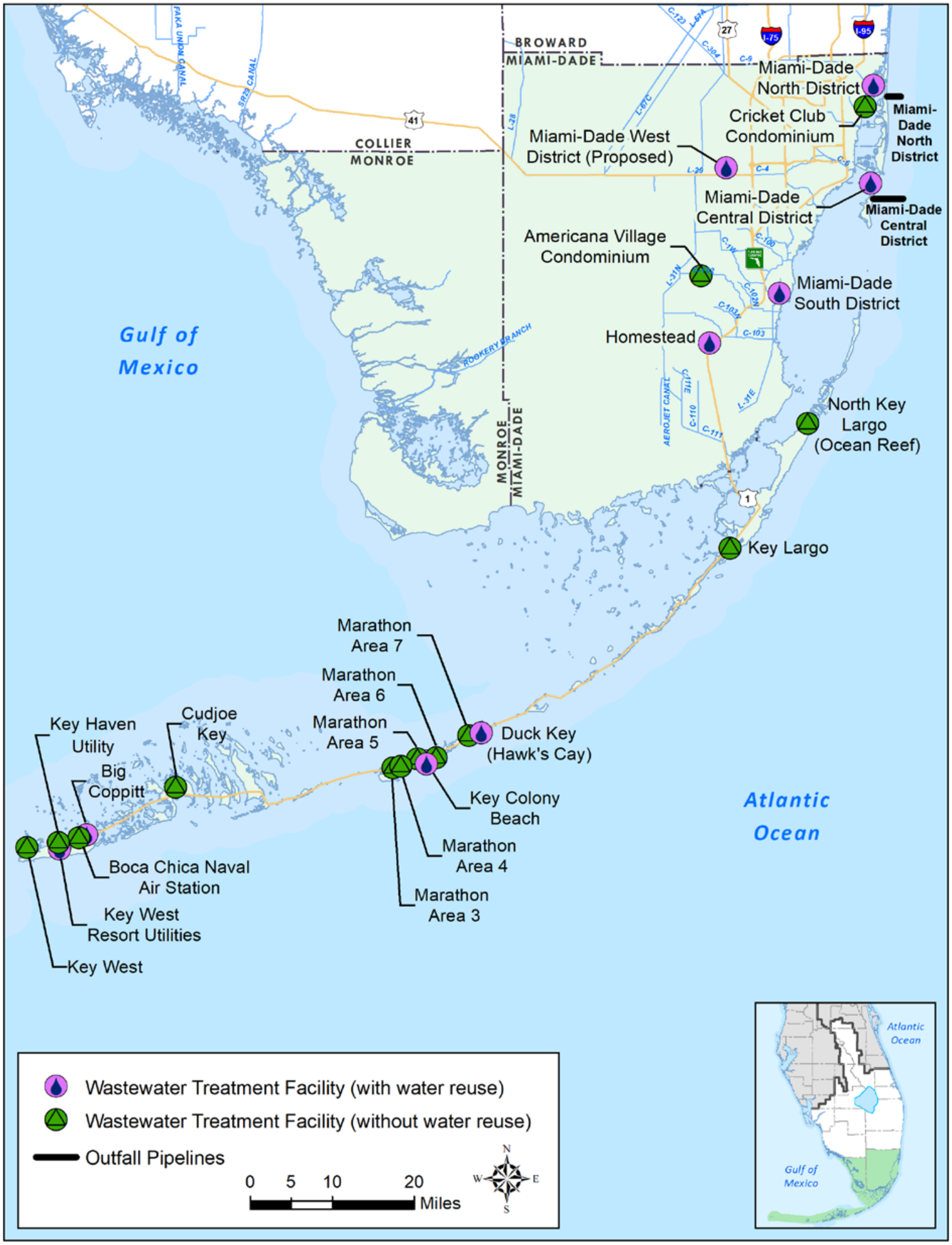


Figure F-3. Wastewater and reuse facilities in Miami-Dade County and the portion of Monroe County within the LEC Planning Area.

Table F-1. Wastewater/reclaimed flows (in mgd) and reuse percentages for facilities with capacities of 0.10 mgd or greater in Palm Beach County.[a]

Entity/Facility	Permit Number	2016				2040			
		FDEP-Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Reuse[b] (%)	FDEP-Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Reuse[b] (%)
Boca Raton[c]	FL0026344	17.50	14.89	9.27	62%	17.50	15.12	15.47	100%[d]
East Central Regional[e]	FLA041360	70.00	43.07	13.81	32%	70.00	55.56	17.82	32%
Palm Beach County – Western Region (Belle Glade)[e]	FLA027740	6.50	2.44	0.00	0%	6.50	2.83	0.00	0%
Palm Beach County – Western Region North (Pahokee)[e]	FLA136778	1.20	0.88	0.00	0%	1.20	1.02	0.00	0%
Loxahatchee River District	FL0034649	11.00	6.78	7.59	100%	15.00	12.00	11.00	92%
Palm Beach County – Central Region[e]	FL0471275	3.00	0.48	0.60	100%	3.00	0.61	0.76	100%
Palm Beach County – Southern Regional[e]	FL0041424	35.00	20.91	13.96	67%	35.00	27.60	18.43	67%
Seacoast Utility Authority PGA Regional	FL0038768	12.00	9.15	8.39	92%	12.00	9.20	13.45	100%
South Central Regional[e]	FL0035980	24.00	17.37	7.01	40%	24.00	21.89	13.30[f]	61%
Wellington[e]	FLA042595	6.50	3.59	0.49	14%	6.50	4.20	0.57	14%
Palm Beach County Total		**186.70**	**119.56**	**61.12**	**51%**	**190.70**	**150.03**	**90.80**	**61%**

FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; WWTF = wastewater treatment facility.

[a] 2016 data are from the *2016 Reuse Inventory* (FDEP 2017). Projected 2040 data are provided by the utilities, unless noted otherwise.

[b] Reuse percentage was calculated by dividing “Average Daily Reuse Flow” by “Average Daily WWTF Flow” (maximum 100%).

[c] Projections for 2027 were provided. The 2040 flow was estimated based on the applicable percent change in population from 2025 to 2040.

[d] Disposal through ocean outfall still is expected to occur during wet weather periods.

[e] The utility did not provide projected 2040 flows. Flows were estimated based on the applicable percent change in population from 2016 to 2040.

[f] Based on the 2025 ocean outfall legislation requirement.

Table F-2. Wastewater/reclaimed flows (in mgd) and reuse percentages for facilities with capacities of 0.10 mgd or greater in Broward County.[a]

Entity/Facility	Permit Number	2016				2040			
		FDEP-Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Reuse[b] (%)	FDEP-Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Reuse[b] (%)
Broward County North Regional	FL0031771	95.00	70.50	4.30	6%	95.00	75.00	26.00	35%
Cooper City	FL0040398	4.27	2.50	0.00	0%	4.27	2.55	1.00[c]	0%
Coral Springs Improvement District	FLA041301	7.72	5.91	0.00	0%	8.67	5.67	0.00	0%
Davie (WWTF)	FL0040541	4.85	1.27	0.00	0%	4.85	3.50	0.00	0%
Davie (WRF)	FLA706736	3.50	1.28	0.45	35%	7.50	5.00	5.00	100%
Fort Lauderdale – George T. Lohmeyer[d]	FLA041378	55.70	38.46	0.00	0%	62.00	52.84	0.00	0%
Hollywood Southern Regional	FL0026255	55.50	37.67	5.43	14%	55.50	41.00	12.30[e]	24%
Margate	FLA041289	10.10	7.59	0.00	0%	11.60	8.50	1.00	12%
Miramar[f]	FLA017025	12.70	10.25	3.95	39%	12.70	11.89	4.58	39%
Pembroke Pines	FLA013575	9.50	6.59	0.00	0%	9.50	7.68	0.00	0%
Plantation	FLA040401	18.90	12.03	0.68	5%	18.90	15.50	0.00	0%
Pompano Beach	FLA013581	7.50	2.38	2.11	89%	12.00	7.44	7.44	100%
Sunrise – Southwest	FLA013580	0.45	0.34	0.34	100%	2.00	1.00	0.50	50%
Sunrise – Sawgrass	FLA042641	20.00	12.59	0.00	0%	30.00	20.00	6.00	30%
Sunrise – Springtree	FLA041947	10.00	8.01	0.00	0%	15.00	10.00	0.00	0%
Tindall Hammock	FLA013583	0.60	0.23	0.23	100%	0.60	0.47	0.47	100%
Broward County Total		**316.29**	**217.60**	**17.49**	**8%**	**350.09**	**268.04**	**64.29**	**24%**

FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; WWTF = wastewater treatment facility.

[a] 2016 data are from the *2016 Reuse Inventory* (FDEP 2017). Projected 2040 data are provided by the utilities, unless noted otherwise.

[b] Reuse percentage was calculated by dividing “Average Daily Reuse Flow” by “Average Daily WWTF Flow” (maximum 100%).

[c] Contracted reuse in Miramar, which is not included in the reuse percentage.

[d] Projections for 2026 were provided. The 2040 flow was estimated based on the applicable percent change in population from 2025 to 2040.

[e] Includes 4.50 mgd of contracted reuse outside of the service area, which is not included in the reuse percentage.

[f] The utility did not provide projected 2040 flows. Flows were estimated based on the applicable percent change in population from 2016 to 2040.

Table F-3. Wastewater/reclaimed flows (in mgd) and reuse percentages for facilities with capacities of 0.10 mgd or greater in Miami-Dade County.[a]

Entity/Facility	Permit Number	2016				2040			
		FDEP-Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Reuse[b] (%)	FDEP-Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Reuse[b] (%)
Americana Village Condominiums[c]	FLA013641	0.20	0.10	0.00	0%	0.20	0.12	0.00	0%
Cricket Club Condominiums[c]	FLA013637	0.11	0.08	0.00	0%	0.11	0.10	0.00	0%
Homestead	FLA013609	4.50	4.61	4.61	100%	10.00	10.00	10.00	100%
MDWASD Central District[d]	FLA024805	143.00	123.06	8.46	7%	83.00	384.41	131.50[e]	34%
MDWASD North District[d]	FL0032182	120.00	83.97	4.17	5%	85.00			
MDWASD South District[d]	FLA042137	112.50	104.14	4.38	4%	131.00			
MDWASD West District (proposed)[d]	--	--	--	--	--	102.00			
Miami-Dade County Total		**380.31**	**315.96**	**21.62**	**7%**	**411.31**	**394.63**	**141.50**	**36%**

FDEP = Florida Department of Environmental Protection; MDWASD = Miami-Dade Water and Sewer Department; mgd = million gallons per day; WWTF = wastewater treatment facility.

[a] 2016 data are from the *2016 Reuse Inventory* (FDEP 2017). Projected 2040 data are provided by the utilities, unless noted otherwise.

[b] Reuse percentage was calculated by dividing "Average Daily Reuse Flow" by "Average Daily WWTF Flow" (maximum 100%).

[c] The utility did not provide projected 2040 flows. Flows were estimated based on the applicable percent change in population from 2016 to 2040.

[d] Projections for 2027 were provided. The 2040 flow was estimated based on the applicable percent change in population from 2025 to 2040.

[e] Includes the reuse flow required to meet the Ocean Outfall Law requirement for 2025.

Table F-4. Wastewater/reclaimed flows (in mgd) and reuse percentages for facilities with capacities of 0.10 mgd or greater in Monroe County.[a]

Entity/Facility	Permit Number	2016				2040			
		FDEP-Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Reuse[b] (%)	FDEP-Rated WWTF Capacity	Average Daily WWTF Flow	Average Daily Reuse Flow	Reuse[b] (%)
Big Coppitt Regional	FLA567591	0.41	0.15	0.04	27%	0.55[c]	0.48	0.04	8%
Boca Chica Naval Air Station[d]	FLA147117	0.40	0.03	0.00	0%	--	--	--	--
Cudjoe Key	FLA671932	--	--	--	--	0.94	0.80	0.00	0%
Duck Key (Hawk's Cay)	FLA014772	0.27	0.15	0.07	47%	0.27	0.23	0.07	30%
Key Colony Beach[e]	FLA014720	0.34	0.19	0.03	16%	0.34	0.19	0.03	16%
Key Haven Utility[d]	FLA014867	0.20	0.10	0.00	0%	--	--	--	--
Key Largo[e]	FLA370967	2.30	1.42	0.00	0%	2.30	1.42	0.00	0%
Key West – Richard A. Heyman	FLA147222	10.00	4.20	0.00	0%	10.00	4.40	0.00	0%
Key West Resort Utilities[e]	FLA014951	0.50	0.40	0.12	30%	0.50	0.40	0.12	30%
Marathon – Service Area 3[f]	FLA642851	0.25	0.17	0.00	0%	0.25	0.16	0.04	25%
Marathon – Service Area 4[f]	FLA550973	0.40	0.23	0.00	0%	0.40	0.33	0.09	27%
Marathon – Service Area 5[f]	FLA187364	0.45	0.30	0.00	0%	0.45	0.28	0.08	29%
Marathon – Service Area 6[f]	FLA579033	0.20	0.08	0.00	0%	0.20	0.09	0.00	0%
Marathon – Service Area 7[f]	FLA705250	0.20	0.06	0.00	0%	0.20	0.07	0.02	29%
North Key Largo (Ocean Reef)	FLA015009	0.50	0.24	0.03	12%	0.50	0.26	0.00	0%
Monroe County Total		**16.42**	**7.72**	**0.29**	**4%**	**16.90**	**9.11**	**0.49**	**5%**
LEC Planning Area Total		**899.72**	**660.84**	**100.52**	**15%**	**969.00**	**821.81**	**297.08**	**36%**

FDEP = Florida Department of Environmental Protection; LEC = Lower East Coast; mgd = million gallons per day; WWTF = wastewater treatment facility.

[a] 2016 data are from the *2016 Reuse Inventory* (FDEP 2017). Projected 2040 data are provided by the utilities, unless noted otherwise.

[b] Reuse percentage is calculated by dividing "Average Daily Reuse Flow" by "Average Daily WWTF Flow" (maximum 100%).

[c] Based on projected peak monthly flows.

[d] Wastewater flows will be diverted to the Big Coppitt Regional WWTF.

[e] The utility did not provide projected 2040 flows. Flows remain the same as 2016, given no expected increase in potable water use.

[f] Projection is for 2036.

Table F-5. Wastewater disposal and reuse types and volumes (in mgd) for facilities with capacities of 0.10 mgd or greater in Palm Beach County.[a]

Entity/Facility	2016					2040				
	Disposal		Reuse			Disposal		Reuse		
	Ocean Outfall	Deep Injection Well	Public Access Irrigation[b]	Groundwater Recharge[c]	Other Reuse Types[d]	Ocean Outfall	Deep Injection Well	Public Access Irrigation[b]	Groundwater Recharge[c]	Other Reuse Types[d]
Boca Raton[e]	5.84	0.00	8.13	0.00	1.14	0.00[f]	0.00	13.87	0.00	1.60
East Central Regional[g]	0.00	29.26	0.00	0.00	13.81	0.00	37.74	0.00	0.00	17.82
Palm Beach County – Western Region (Belle Glade)[g]	0.00	2.44	0.00	0.00	0.00	0.00	2.83	0.00	0.00	0.00
Palm Beach County – Western Region North (Pahokee)[g]	0.00	0.88	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00
Loxahatchee River District[h]	0.00	2.56	7.59	0.00	0.00	0.00	3.00	8.50	1.00	1.50
Palm Beach County – Central Region[g]	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.76	0.00	0.00
Palm Beach County – Southern Regional[g]	0.00	7.70	9.90	0.00	4.06	0.00	10.16	13.07	0.00	5.36
Seacoast Utility Authority PGA Regional	0.00	1.26	8.39	0.00	0.00	0.00	0.00[i]	13.45	0.00	0.00
South Central Regional[g]	0.02	10.34	6.84	0.00	0.17	0.03[f]	8.56	13.09	0.00	0.21
Wellington[g]	0.00	3.10	0.49	0.00	0.00	0.00	3.63	0.57	0.00	0.00
Palm Beach County Total	**5.86**	**57.54**	**41.94**	**0.00**	**19.18**	**0.03**	**66.94**	**63.31**	**1.00**	**26.49**

mgd = million gallons per day.

[a] 2016 data are from the *2016 Reuse Inventory* (Florida Department of Environmental Protection 2017). Projected 2040 data are provided by the utilities, unless noted otherwise.

[b] Public access irrigation includes golf courses, parks, schools, common areas, etc.

[c] Groundwater recharge includes percolation ponds/pits.

[d] Other reuse types include other permitted uses such as wetland hydration, cooling water, in-facility processes, and toilet flushing.

[e] Projections for 2027 were provided. The 2040 flow was estimated based on the applicable percent change in population from 2025 to 2040.

[f] Disposal through ocean outfall still is expected to occur during wet weather periods.

[g] The utility did not provide projected 2040 information. Disposal and reuse flows are based on projected flows from **Table F-1**.

[h] The Loxahatchee River District WWTF blends concentrate from the Town of Jupiter's water treatment plant into their reuse system. When supply exceeds demand, blended water is disposed through deep well injection.

[i] Disposal through deep well injection still is expected to occur during wet weather periods.

Table F-6. Wastewater disposal and reuse types and volumes (in mgd) for facilities with capacities of 0.10 mgd or greater in Broward County.[a]

Entity/Facility	2016					2040				
	Disposal		Reuse			Disposal		Reuse		
	Ocean Outfall	Deep Injection Well	Public Access Irrigation[b]	Groundwater Recharge[c]	Other Reuse Types[d]	Ocean Outfall	Deep Injection Well	Public Access Irrigation[b]	Groundwater Recharge[c]	Other Reuse Types[d]
Broward County North Regional	27.50	38.90	0.20	0.00	4.10	0.00[e]	49.00	26.00	0.00	0.00
Cooper City[f]	0.00	0.78	0.00	0.00	0.00	0.00	0.83	1.00	0.00	0.00
Coral Springs Improvement District	0.00	5.91	0.00	0.00	0.00	0.00	5.67	0.00	0.00	0.00
Davie (WWTF)	0.00	0.83	0.00	0.00	0.00	0.00	0.00[g]	0.00	0.00	0.00
Davie (WRF)	0.00	0.00	0.37	0.00	0.08	0.00	0.00[g]	4.00	0.00	1.00
Fort Lauderdale – George T. Lohmeyer[h]	0.00	38.46	0.00	0.00	0.00	0.00	52.84	0.00	0.00	0.00
Hollywood Southern Regional	15.02	22.65	2.54	0.00	2.89	0.00[e]	41.00	12.30[i]	0.00	0.00
Margate	0.00	7.59	0.00	0.00	0.00	0.00	7.50	1.00	0.00	0.00
Miramar[j]	0.00	6.30	2.93	0.00	1.02	0.00	7.31	3.40	0.00	1.18
Pembroke Pines	0.00	6.59	0.00	0.00	0.00	0.00	7.68	0.00	0.00	0.00
Plantation	0.00	10.04	0.00	0.00	0.68	0.00	15.50	0.00	0.00	0.00
Pompano Beach	0.00	0.00	2.11	0.00	0.00	0.00	0.00	7.44	0.00	0.00
Sunrise – Southwest	0.00	0.00	0.00	0.34	0.00	0.00	0.50	0.20	0.20	0.10
Sunrise – Sawgrass	0.00	12.59	0.00	0.00	0.00	0.00	14.00	5.50	0.00	0.50
Sunrise – Springtree	0.00	8.01[k]	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
Tindall Hammock	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.23	0.24	0.00
Broward County Total	**42.52**	**158.65**	**8.15**	**0.57**	**8.77**	**0.00**	**211.83**	**61.07**	**0.44**	**2.78**

mgd = million gallons per day; WRF = water reuse facility; WWTF = wastewater treatment facility.

[a] 2016 data are from the *2016 Reuse Inventory* (Florida Department of Environmental Protection 2017). Projected 2040 data are provided by the utilities, unless noted otherwise.

[b] Public access irrigation includes golf courses, parks, schools, common areas, etc.

[c] Groundwater recharge includes percolation ponds/pits.

[d] Other reuse types include other permitted uses such as cooling water, in-facility processes, and toilet flushing.

[e] Disposal through ocean outfall still is expected to occur during wet weather periods.

[f] Cooper City sends 1.72 mgd of treated wastewater to Hollywood Southern Regional WWTF for reuse.

[g] Disposal through deep well injection still is expected to occur during wet weather periods.

[h] Projections for 2026 were provided. The 2040 flow was estimated based on the applicable percent change in population from 2025 to 2040.

[i] Includes 4.50 mgd of contracted reuse outside of the service area.

[j] The utility did not provide projected 2040 information. Disposal and reuse flows are based on projected flows from **Table F-2**.

[k] Effluent is sent to the Sunrise–Sawgrass WWTF for deep well injection.

Table F-7. Wastewater disposal and reuse types and volumes (in mgd) for facilities with capacities of 0.10 mgd or greater in Miami-Dade County.[a]

<table>
<tr><th rowspan="3">Entity/Facility</th><th colspan="5">2016</th><th colspan="5">2040</th></tr>
<tr><th colspan="2">Disposal</th><th colspan="3">Reuse</th><th colspan="2">Disposal</th><th colspan="3">Reuse</th></tr>
<tr><th>Ocean Outfall</th><th>Deep Injection Well</th><th>Public Access Irrigation[b]</th><th>Groundwater Recharge[c]</th><th>Other Reuse Types[d]</th><th>Ocean Outfall</th><th>Deep Injection Well</th><th>Public Access Irrigation[b]</th><th>Groundwater Recharge[c]</th><th>Other Reuse Types[d]</th></tr>
<tr><td>Americana Village Condominiums[e]</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr>
<tr><td>Cricket Club Condominiums[e]</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr>
<tr><td>Homestead</td><td>0.00</td><td>0.00</td><td>0.00</td><td>4.61</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>8.00</td><td>2.00</td></tr>
<tr><td>MDWASD Central District[e,f]</td><td>126.90</td><td>0.00</td><td>0.00</td><td>0.00</td><td>8.46</td><td rowspan="4">0.00[g]</td><td rowspan="4">252.91</td><td rowspan="4">0.00</td><td rowspan="4">0.00</td><td rowspan="4">131.50[h]</td></tr>
<tr><td>MDWASD North District[e,f]</td><td>38.20</td><td>41.66</td><td>0.73</td><td>0.00</td><td>3.44</td></tr>
<tr><td>MDWASD South District[e,f]</td><td>0.00</td><td>97.28</td><td>0.00</td><td>0.00</td><td>4.38</td></tr>
<tr><td>MDWASD West District (proposed)[e,f]</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td></tr>
<tr><td>**Miami-Dade County Total**</td><td>**165.10**</td><td>**138.94**</td><td>**0.73**</td><td>**4.61**</td><td>**16.28**</td><td>**0.00**</td><td>**252.91**</td><td>**0.00**</td><td>**8.00**</td><td>**133.50**</td></tr>
</table>

MDWASD = Miami-Dade Water and Sewer Department; mgd = million gallons per day.

[a] 2016 data are from the *2016 Reuse Inventory* (Florida Department of Environmental Protection 2017). Projected 2040 data are provided by the utilities, unless noted otherwise.

[b] Public access irrigation includes golf courses, parks, schools, common areas, etc.

[c] Groundwater recharge includes percolation ponds/pits.

[d] Other reuse types include other permitted uses such as cooling water, in-facility processes, and toilet flushing.

[e] The utility did not provide projected 2040 information. Disposal and reuse flows are based on projected flows from **Table F-3**.

[f] Projections for 2027 were provided. The 2040 flow was estimated based on the applicable percent change in population from 2025 to 2040.

[g] Disposal through ocean outfall still is expected to occur during wet weather periods.

[h] Includes the reuse flow required to meet the Ocean Outfall Law requirement for 2025.

Table F-8. Wastewater disposal and reuse types and volumes (in mgd) for facilities with capacities of 0.10 mgd or greater in Monroe County.[a]

Entity/Facility	2016					2040				
	Disposal		Reuse			Disposal		Reuse		
	Shallow Injection Well[b]	Deep Injection Well	Public Access Irrigation[c]	Groundwater Recharge[d]	Other Reuse Types[e]	Shallow Injection Well[b]	Deep Injection Well	Public Access Irrigation[c]	Groundwater Recharge[d]	Other Reuse Types[e]
Big Coppitt Regional	0.11	0.00	0.04	0.00	0.00	0.44	0.00	0.04	0.00	0.00
Boca Chica Naval Air Station[f]	0.03	0.00	0.00	0.00	0.00	--	--	--	--	--
Cudjoe Key	--	--	--	--	--	0.00	0.80	0.00	0.00	0.00
Duck Key (Hawk's Cay)	0.10	0.00	0.07	0.00	0.00	0.16	0.00	0.07	0.00	0.00
Key Colony Beach[g]	0.16	0.00	0.03	0.00	0.00	0.16	0.00	0.03	0.00	0.00
Key Haven Utility[f]	0.10	0.00	0.00	0.00	0.00	--	--	--	--	--
Key Largo[g]	1.42	0.00	0.00	0.00	0.00	1.42	0.00	0.00	0.00	0.00
Key West – Richard A. Heyman	0.00	4.20	0.00	0.00	0.00	0.00	4.40	0.00	0.00	0.00
Key West Resort Utilities[g]	0.28	0.00	0.11	0.00	0.01	0.28	0.00	0.11	0.00	0.01
Marathon – Service Area 3[h]	0.17	0.00	0.00	0.00	0.00	0.16	0.00	0.04	0.00	0.00
Marathon – Service Area 4[h]	0.22	0.00	0.00	0.00	0.00	0.33	0.00	0.09	0.00	0.00
Marathon – Service Area 5[h]	0.30	0.00	0.00	0.00	0.00	0.28	0.00	0.08	0.00	0.00
Marathon – Service Area 6[h]	0.08	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00
Marathon – Service Area 7[h]	0.06	0.00	0.00	0.00	0.00	0.07	0.00	0.02	0.00	0.00
North Key Largo (Ocean Reef)	0.21	0.00	0.03	0.00	0.00	0.26	0.00	0.00	0.00	0.00
Monroe County Total	**3.24**	**4.20**	**0.28**	**0.00**	**0.01**	**3.65**	**5.20**	**0.48**	**0.00**	**0.01**
LEC Planning Area Total	**213.48**[i]	**362.57**	**51.10**	**5.18**	**44.24**	**0.03**[i]	**536.88**	**124.86**	**9.44**	**162.78**

LEC = Lower East Coast; mgd = million gallons per day; WWTF = wastewater treatment facility.

a 2016 data are from the *2016 Reuse Inventory* (Florida Department of Environmental Protection 2017). Projected 2040 data are provided by the utilities, unless noted otherwise.

b Shallow injection well is a wastewater disposal option only used in Monroe County (within the LEC Planning Area). Ocean outfall is not a wastewater disposal method in this county.

c Public access irrigation includes golf courses, parks, schools, common areas, etc.

d Groundwater recharge includes percolation ponds/pits.

e Other reuse types include other permitted uses such as cooling water, in-facility processes, and toilet flushing.

f Wastewater flows will be diverted to the Big Coppitt Regional WWTF.

g The utility did not provide projected 2040 information. Disposal and reuse flows are based on projected flows from **Table F-4**.

h Projection is for 2036.

i Planning area total is the combined ocean outfall volume from Palm Beach, Broward, and Miami-Dade counties (**Tables F-5** through **F-7**).

WASTEWATER/REUSE UTILITY PROFILES

This section contains profiles for each of the wastewater/reuse facilities within the LEC Planning Area with a treatment capacity of 0.10 mgd or greater. The profiles are organized by county then alphabetically by utility. Each profile contains the following:

- **Existing Treatment, Disposal, and Reuse** – This section presents the FDEP-rated treatment capacity and average daily flows of wastewater and reclaimed water. If applicable, the average daily flow of treated wastewater is provided. Current (2016) capacity and flow information was obtained from the *2016 Reuse Inventory* (FDEP 2017).
- **Future Treatment, Disposal, and Reuse** – This section provides a summary of any proposed/future plans for the utility, which may include increased capacities, flows, or reclaimed water customers.

Reclaimed Water Pump

Pompano Beach Water Reuse Facility

Palm Beach County Wastewater Treatment Facilities

Boca Raton Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Boca Raton's Utility Services Department operates the Boca Raton WWTF, which has an FDEP-permitted capacity of 17.50 mgd and provides wastewater services for the City of Boca Raton. In 2016, the annual average treated wastewater flow from the facility was 14.89 mgd. Treated wastewater from the facility is combined with concentrate from the city's membrane system (0.22 mgd) at the potable water treatment plant and either reused or discharged. In 2016, the city used 9.27 mgd of reclaimed water, mostly for public access irrigation, such as at golf courses, parks, schools, medians, and residences (8.13 mgd). The remaining treated wastewater and concentrate (5.84 mgd) was discharged via ocean outfall.

The Ocean Outfall Law mandates that 60 percent of treated wastewater disposed of through ocean outfalls must be reused. For Boca Raton, the requirement translated to an additional 6.20 mgd of reuse (above the 2008 baseline flow), for a total reuse of 11.80 mgd by 2025. In 2016, the Boca Raton WWTF was designated a 100 percent reuse (capacity) facility by the FDEP and was deemed to have met the reuse requirements of the Ocean Outfall Law. The City is using reclaimed water to meet irrigation demands, negate potential impacts to wetlands, and meet Restricted Allocation Area criteria. As such, the South Florida Water Management District (SFWMD) included conditions in the City's permit for connecting customers to the reclaimed water system.

The Boca Raton WWTF provides reclaimed water to three universities, six golf courses, four schools, and six parks. The system also provides reclaimed water to approximately 1,100 single-family residences as well as multiple-family complexes and businesses. The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Arvida Park of Commerce
- Boca Corporate Center & Campus
- Boca Raton Airport Properties
- Boca Raton High School
- Boca Raton Resort and Country Club
- Boca West Country Club
- Broken Sound Country Club – East Course
- Broken Sound Country Club – West Course
- Countess de Hoernle Park
- Don Estridge Middle School
- Florida Atlantic University
- Lynn University
- Patch Reef Park
- Royal Palm Yacht Club
- Woodfield Country Club

Future Treatment, Disposal, and Reuse

To meet the Ocean Outfall Law requirements, the City of Boca Raton expanded its reclaimed water production capacity to 17.50 mgd and extended the reclaimed distribution system's capacity to more than 17.50 mgd. Most of the reclaimed water is expected to be used for irrigation, as it is currently.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**17.50 mgd**	**FDEP-Permitted Treatment Capacity**	**17.50 mgd**
Total Treated Wastewater	**14.89 mgd**	**Total Treated Wastewater**	**15.12 mgd**
Disposal		Disposal	
Ocean Outfall	5.84 mgd[b]	Ocean Outfall	0.00 mgd[b,c]
Reuse		Reuse	
Total	9.27 mgd[b]	Total	15.47 mgd[b]
Irrigation	8.13 mgd	Irrigation	13.87 mgd
At Facility	1.14 mgd	Industrial	1.60 mgd
Reuse Percentage	**62%**	**Reuse Percentage**	**100%**

a Projections for 2027 were provided. The 2040 flow was estimated based on the applicable percent change in population from 2025 to 2040.

b Includes supplemental flows from the WWTF membrane concentrate not included in the total treated wastewater flow.

c Disposal through ocean outfall still is expected to occur during wet weather periods.

East Central Regional Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The East Central Regional WWTF is funded and governed by a board of representatives from the entities served by the facility: the cities of West Palm Beach, Lake Worth, and Riviera Beach; the Town of Palm Beach; and Palm Beach County. Each entity is responsible for its wastewater collection and transmission systems. The facility, which has an FDEP-permitted capacity of 70.00 mgd, treated an annual average daily flow of 43.07 mgd in 2016. Approximately 13.81 mgd of the treated wastewater was reused in 2016, while 29.26 mgd was disposed of through deep well injection.

Some treated wastewater from this facility is sent to the adjacent Palm Beach County Central Region Water Reuse Facility (WRF), where it is further treated to reclaimed water standards and reused for irrigation. Palm Beach County's Central Region WRF is summarized in a separate profile.

A reclaimed water treatment system is located at the East Central Regional WWTF site. The system takes treated wastewater from the WWTF, provides additional treatment, and pumps it to the Florida Power & Light (FPL) West County Energy Center for cooling purposes. The distribution pipeline between the WWTF and the FPL West County Energy Center was constructed and is maintained by the Palm Beach County Water Utilities Department. Reclaimed water deliveries to the FPL center started in 2011. In 2016, the WWTF also started sending reclaimed water to the new Ballpark of the Palm Beaches for irrigation.

Primary End Users

- FPL West County Energy Center
- Ballpark of the Palm Beaches

Future Treatment, Disposal, and Reuse

The agreement between the Palm Beach County Water Utilities Department and FPL is for delivery of up to 27.00 mgd of reclaimed water from the East Central Regional WWTF. Additional reclaimed water users located along the pipeline between the WWTF and the FPL West County Energy Center will depend on future demands and supplies.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**70.00 mgd**	**FDEP-Permitted Treatment Capacity**	**70.00 mgd**
Total Treated Wastewater	**43.07 mgd**	**Total Treated Wastewater**	**55.56 mgd**
Disposal		Disposal	
Deep Well Injection	29.26 mgd	Deep Well Injection	37.74 mgd
Reuse		Reuse	
Industrial/Cooling	13.81 mgd	Industrial/Cooling	17.82 mgd
Reuse Percentage	**32%**	**Reuse Percentage**	**32%**

[a] The utility did not provide projected 2040 flows. Flows were estimated based on the applicable percent change in population from 2016 to 2040.

Loxahatchee River District Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

In 1971, the state legislature created the Loxahatchee River Environmental Control District, now referred to as the Loxahatchee River District, which owns, operates, and maintains a WWTF in the Town of Jupiter. The WWTF serves the municipalities of Jupiter, Tequesta, and Juno Beach, along with the unincorporated areas of northern Palm Beach and southern Martin counties. The facility has an FDEP-permitted capacity of 11.00 mgd, with an annual average daily wastewater flow of 6.78 mgd in 2016. Approximately 7.59 mgd was reused in 2016, while 2.56 mgd was disposed of via deep well injection. The reclaimed water is used primarily for irrigation, and in 2016, the Loxahatchee River District provided reclaimed water to 13 golf courses, 14 parks, 3 schools, and over 5,100 residences for irrigation.

Concentrate from the Town of Jupiter's water treatment plant is blended with reclaimed water from the Loxahatchee River District WWTF. The blended concentrate increases the reclaimed water supply and reduces the need for supplemental supplies from traditional sources of water. The supplemental water is included as water reuse; therefore, the reuse flow can exceed the treated flow. The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Abacoa Golf Club
- Abacoa Development
- Admiral's Cove East
- Admiral's Cove West
- Bear's Club
- Frenchman's Creek North
- Golf Club of Jupiter
- Indian Creek Golf Club
- Jonathan's Landing Golf Club
- Jupiter Country Club
- Jupiter Hills Club Numbers 1 and 2
- Loxahatchee Club (Maplewood)
- Riverbend Country Club
- Riverbend Golf Club
- Turtle Creek Golf Club
- Tequesta Country Club

Future Treatment, Disposal, and Reuse

Future expansion of the Loxahatchee River District's reuse system is expected as the wastewater treatment flow increases. The goal is to maximize reuse efficiency, and correspondingly reduce disposal through deep well injection.

Future reclaimed water uses for the Loxahatchee River District WWTF depend on an existing agreement with Seacoast Utility Authority. Under the agreement, Seacoast Utility Authority sends reclaimed water to the Abacoa development for irrigation. If the agreement is not renewed, the Loxahatchee River District would serve Abacoa and may need to limit expansion to new end users in the future. If the agreement is renewed, Abacoa would not need to be served by Loxahatchee River District and increases in reclaimed water could be directed to new end users.

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**11.00 mgd**	**FDEP-Permitted Treatment Capacity**	**15.00 mgd**
Total Treated Wastewater	**6.78 mgd**	**Total Treated Wastewater**	**12.00 mgd**
Disposal		Disposal	
Deep Well Injection	2.56 mgd[a]	Deep Well Injection	3.00 mgd[a]
Reuse		Reuse	
Irrigation	7.59 mgd[a]	Total	11.00 mgd[a]
		Irrigation	8.50 mgd
		Groundwater Recharge	1.00 mgd
		At Facility	1.50 mgd
Reuse Percentage	**100%**	**Reuse Percentage**	**92%**

[a] Includes concentrate water from the Town of Jupiter's water treatment plant not included in the total treated wastewater flow.

Palm Beach County – Western Region (Belle Glade) Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Palm Beach County Water Utilities Department operates and maintains the Western Region (Belle Glade) wastewater collection and treatment system in Belle Glade. The WWTF has an FDEP-permitted capacity of 6.50 mgd and provides wastewater services for Belle Glade and, on a contract basis, the City of South Bay. In 2016, the annual average daily flow from the facility was 2.44 mgd. All the treated wastewater (2.44 mgd) was disposed of through deep well injection.

Future Treatment, Disposal, and Reuse

The Palm Beach County Water Utilities Department does not have plans to implement a reclaimed water system. The City of Belle Glade has determined a water reuse system was not feasible. In the future, the utility may decide such an initiative would enhance water availability.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**6.50 mgd**	**FDEP-Permitted Treatment Capacity**	**6.50 mgd**
Total Treated Wastewater	**2.44 mgd**	**Total Treated Wastewater**	**2.83 mgd**
Disposal		Disposal	
Deep Well Injection	2.44 mgd	Deep Well Injection	2.83 mgd
Reuse		Reuse	
Total	0.00 mgd	Total	0.00 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

[a] The utility did not provide projected 2040 flows. Flows were estimated based on the applicable percent change in population from 2016 to 2040.

Palm Beach County – Western Region North (Pahokee) Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Palm Beach County Water Utilities Department operates and maintains the wastewater collection and treatment system in Pahokee. The Western Region North (Pahokee) WWTF has an FDEP-permitted capacity of 1.20 mgd and provides wastewater services for Pahokee. In 2016, the annual average daily flow from the facility was 0.88 mgd. All the treated wastewater is disposed of through deep well injection.

Future Treatment, Disposal, and Reuse

The Palm Beach County Water Utilities Department does not have plans to implement a reclaimed water system. The City of Pahokee has determined a water reuse system was not feasible. In the future, the utility may decide such an initiative would enhance water availability.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**1.20 mgd**	**FDEP-Permitted Treatment Capacity**	**1.20 mgd**
Total Treated Wastewater	**0.88 mgd**	**Total Treated Wastewater**	**1.02 mgd**
Disposal		Disposal	
Deep Well Injection	0.88 mgd	Deep Well Injection	1.02 mgd
Reuse		Reuse	
Total	0.00 mgd	Total	0.00 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

[a] The utility did not provide projected 2040 flows. Flows were estimated based on the applicable percent change in population from 2016 to 2040.

Palm Beach County – Central Region Water Reuse Facility

Existing Treatment, Disposal, and Reuse

The Palm Beach County Water Utilities Department constructed the Central Region WRF on the site of the former Century Village WWTF, and it began operation in 2008. The WRF receives treated wastewater from the adjacent East Central Regional WWTF and further treats it to reclaimed water quality for irrigation of a golf course and various landscaped areas. The Central Region WRF has an FDEP-permitted capacity of 3.00 mgd and treated an annual average daily flow of 0.48 mgd in 2016. All the treated wastewater from the facility was reused in 2016. Reclaimed water from this WRF reduces competition for groundwater withdrawn by the nearby Palm Beach County System Number 8 Wellfield and the City of West Palm Beach's wellfield. The reclaimed water is used for irrigation, and in 2016, the facility provided reclaimed water to 1 golf course and more than 7,000 residences. The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Century Village
- Cypress Lakes
- Emerald Dunes Golf Course
- Vista Center

Future Treatment, Disposal, and Reuse

Although all the reclaimed water from the Central Region WRF is reused, expansion and optimization of the system may be planned. The utility has indicated that potential future reclaimed water end users include Turnpike Crossing East, and more may be determined in the near future.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**3.00 mgd**	**FDEP-Permitted Treatment Capacity**	**3.00 mgd**
Total Treated Wastewater	**0.48 mgd**	**Total Treated Wastewater**	**0.76 mgd**
Reuse		Reuse	
Irrigation	0.60 mgd[b]	Irrigation	0.76 mgd
Reuse Percentage	**100%**	**Reuse Percentage**	**100%**

[a] The utility did not provide projected 2040 flows. Flows were estimated based on the applicable percent change in population from 2016 to 2040.

[b] The reuse system includes one or more activities in which reclaimed water is returned to the WRF after use and then is available for reuse or disposal.

Palm Beach County – Southern Regional Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Palm Beach County Water Utilities Department operates and maintains the Southern Regional WWTF in unincorporated Boynton Beach. The facility treats wastewater and provides reclaimed water for unincorporated areas of Boynton Beach and Delray Beach. The facility has an FDEP-permitted capacity of 35.00 mgd, with an annual average daily flow of 20.91 mgd in 2016. Approximately 13.96 mgd of the treated wastewater were reused in 2016, while 7.70 mgd were disposed of via deep well injection. The reclaimed water is used primarily for irrigation and, to a lesser extent, to hydrate the Wakodahatchee and Green Cay wetlands.

The facility provides reclaimed water to 7 golf courses, 2 parks, 1 school, and more than 6,000 residences for irrigation. The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Aberdeen Country Club
- Aberdeen
- Addison Reserve Country Club
- Allegro at Boynton Beach
- Atlantic Commons Commercial
- Bethesda
- Boynton Beach Medical Center
- Bridges (Dubois)
- Briella
- Canyon Town Center
- Delray Lakes Estates
- Delray Market Place
- Eagle Point
- Enclave at Westchester
- Jog Road Medical Center
- Gleneagles Country Club
- Gleneagles
- Gran Haven/Casa Bell
- Grand Hagen
- Grand Vista Lakes
- Green Cay Village
- Green Cay Wetlands
- Greystone/Mini-Assemblage
- Grove Isle
- Hagen Ranch Elementary
- Hagen Ranch Medical Center
- Huntington Walk/Villa Borghese
- In the Pines Inc.
- Indian Springs Golf Course
- Lakeridge Falls
- Lexington Club
- Mizner Falls
- Montage Pointe
- Monterey Estates/Bethesda Memorial
- Palm Beach County Library
- Palm Beach School Board 03-Z
- Palm Isles
- Palm Isles West
- Pine Ridge of Delray
- Polo Trace Golf Course
- Ponte Vecchio
- Reform Temple at Shaarei Shalom
- San Marco
- San Michelle/Avalon Estates
- Sawgrass Lakes
- Solid Waste Authority Transfer Station
- South Regional Wastewater Treatment Facility
- Spalding
- St. Andrews Golf Course
- Stone Creek Ranch
- Target/Monterey Shop
- The Grove
- Tivoli Lakes
- Tivoli Reserve

- Trails at Canyon
- Tuscany
- Valencia Cove (formerly Valencia Assemblage)
- Valencia Falls
- Valencia Isles
- Valencia Lakes
- Valencia Palms
- Valencia Pointe/Hagen Assemblage
- Valencia Reserve (formerly Lyons West)
- Valencia Square
- Villagio Reserve (formerly Villagio Isles)
- Vista Center
- Vizcaya
- Wakodahatchee Wetlands
- Westchester Golf Course
- Whitworth Commercial

Future Treatment, Disposal, and Reuse

Palm Beach County has a mandatory reuse zone ordinance for new residential developments within a section of its service area. The Palm Beach County Water Utilities Department continues to pursue additional water reuse opportunities in this zone and surrounding areas. The goal is to increase the overall water reuse percentage and reduce disposal through deep well injection. The utility has suggested seven potential reclaimed water end users, listed below.

Potential End Users

- Appolonia Farms
- Bethesda Health City
- Kenco 282 (Delray Holdings 282)
- Seven Bridges (Hyder)
- Sussman Plat
- Turnpike Crossing East
- Valencia Cove South

FACILITY SUMMARY

2016		Projected 2040[a]	
FDEP-Permitted Treatment Capacity	**35.00 mgd**	**FDEP-Permitted Treatment Capacity**	**35.00 mgd**
Total Treated Wastewater	**20.91 mgd**	**Total Treated Wastewater**	**27.60 mgd**
Disposal		Disposal	
Deep Well Injection	7.70 mgd	Deep Well Injection	10.16 mgd
Reuse		Reuse	
Total	13.96 mgd[b]	Total	18.43 mgd[b]
Irrigation	9.90 mgd	Irrigation	13.07 mgd
At Facility/Wetlands	4.06 mgd	Wetlands	5.36 mgd
Reuse Percentage	**67%**	**Reuse Percentage**	**67%**

a The utility did not provide projected 2040 flows. Flows were estimated based on the applicable percent change in population from 2016 to 2040.

b The reuse system includes one or more activities in which reclaimed water is returned to the WWTF after use and then is available for reuse or disposal.

Seacoast Utility Authority PGA Regional Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Seacoast Utility Authority owns, operates, and maintains the PGA Regional WWTF. The facility services some unincorporated areas of northern Palm Beach County, the incorporated areas of the City of Palm Beach Gardens, the Village of North Palm Beach, the Town of Lake Park, and portions of the Town of Juno Beach. The PGA Regional WWTF has an FDEP-permitted capacity of 12.00 mgd, with an annual average daily flow of 9.15 mgd in 2016.

In 2016, 1.50 mgd of nanofiltration concentrate, 0.30 mgd of groundwater, and 0.02 mgd of potable water on an annual average basis supplemented the Seacoast Utility Authority's reclaimed water supply. Approximately 8.39 mgd of reclaimed water was reused in 2016, while 1.26 mgd were disposed of via deep well injection. An average of 1.47 mgd of reclaimed water was sent to the Loxahatchee River District's reuse system. The reclaimed water is primarily used for irrigation of golf courses, residences, parks, and streetscapes. In 2016, Seacoast Utility Authority provided reclaimed water to 12 golf courses, roadway medians, and two parks, among other users, for irrigation. The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Abacoa
- Ballen Isles East Golf Course
- Ballen Isles West Golf Course
- Bent Tree
- Cimarron Cove
- Eastpointe Briar Lake
- Eastpointe Country Club
- Eastpointe Golf and Racquet
- FPL Administrative Complex
- FPL Monet Substation
- Frenchman's Creek Golf Course
- Frenchman's Reserve
- Gemini Condominiums
- Governor's Pointe
- Juno Bay Colony
- Mariners Cove
- McArthur (Regional) Center
- Mirasol
- Mirasol Walk
- Oak Harbour
- Old Palm Golf Course
- Old Port Cove
- North Palm Beach Country Club
- Paloma
- PGA Boulevard streetscape
- Royale Harbour Condominiums
- Seacoast Utility Authority administration building
- Seacoast Utility Authority Water Treatment Plant
- Seamark Condominiums
- Seasons 52 Restaurant
- South Garden's Apartments
- Southampton
- The Bears Club
- The Isles
- Waterway Terrace Condominiums

Future Treatment, Disposal, and Reuse

Although most of the treated wastewater from the PGA Regional WWTF is reused, Seacoast Utility Authority will continue its efforts to promote the use of reclaimed water as an alternative water supply. The goal is to increase the overall water reuse percentage and reduce disposal through deep well injection. Seacoast Utility Authority projects use of deep well injection only during wet weather conditions and periodic testing of the well. The utility has suggested a potential reclaimed water end user, listed below.

Potential End Users

- Alton

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**12.00 mgd**	**FDEP-Permitted Treatment Capacity**	**12.00 mgd**
Total Treated Wastewater	**9.15 mgd**	**Total Treated Wastewater**	**9.20 mgd**
Disposal		Disposal	
Deep Well Injection	1.26 mgd	Deep Well Injection[a]	0.00 mgd
Reuse		Reuse	
Irrigation	8.39 mgd[b]	Irrigation	13.45 mgd[b]
Reuse Percentage	**92%**	**Reuse Percentage**	**100%**

[a] Disposal through deep well injection still is expected to occur during wet weather periods.
[b] Includes supplemental flows from the WWTF membrane concentrate not included in the total treated wastewater flow.

South Central Regional Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The South Central Regional Wastewater and Disposal Board, formed as a special district in 1974, treats wastewater from the cities of Boynton Beach and Delray Beach at the South Central Regional WWTF. Each city operates and maintains wastewater collection systems in their respective service areas. Older contracts with end users were signed directly with the Disposal Board; however, Boynton Beach is in the process of taking over the original contracts from the board. More recent contracts for reclaimed water are between the end users and the cities of Boynton Beach and Delray Beach.

The South Central Regional WWTF has an FDEP-permitted capacity of 24.00 mgd, with an annual average daily flow of 17.37 mgd. In 2016, approximately 7.01 mgd of the treated wastewater were reused, 10.34 mgd were disposed of via deep well injection, and 0.02 mgd were disposed of via an ocean outfall. Among other uses, the facility distributes reclaimed water to the cities of Boynton Beach and Delray Beach for irrigation at 9 golf courses, 1 school, and 500 residences.

The Ocean Outfall Law mandates that 60 percent of treated wastewater disposed of through ocean outfalls must be reused. The South Central Regional WWTF utilizes one of the ocean outfalls that will be eliminated. The facility is required to reuse an additional 7.70 mgd of treated wastewater (above the 2008 baseline flow), for a total reuse of 13.30 mgd by 2025. The Disposal Board plans to meet the legislation requirements by increasing the capacity of water reuse in the cities of Boynton Beach and Delray Beach. A deep injection well was installed in 2009, thereby nearly eliminating discharge through the ocean outfall; however, ocean outfall will remain for emergency discharges.

City of Boynton Beach

The City of Boynton Beach's Utilities Department operates and maintains the city's wastewater and reclaimed water systems. The city receives reclaimed water from the South Central Regional WWTF and uses it, primarily for irrigation purposes. The City's permitted allocation for groundwater to supply the potable water treatment plant is based on the provision of reclaimed water to various identified entities. The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Arbor Memorial Park
- Bethesda Healthcare
- Bethesda Hospital
- Bethesda Service Center
- Bethesda Park Condominiums
- Boundless Playground
- Boynton Ball Park
- Boynton Beach Cemetery
- Boynton Center Condominiums
- Boynton Library
- Boynton Senior Center
- Caloossa Park
- Chapel Hill – entrance
- Children Museum
- City Hall
- City tennis courts
- Country Club of Florida*
- Crosspointe Elementary
- Delray Dunes*
- East Water Plant
- Forest Park Elementary

- Forresty
- Galaxy School
- Galaxy School Park
- Heritage Park
- Highpoint
- Hunters Run Golf and Racquet Club
- Hunters Run*
- Las Ventanas
- Medians on N. Seacrest Blvd
- Median on S. Federal Hwy
- Medians on SE 4th St
- Office – 709 S. Federal Hwy
- Pence Park
- Pine Tree Golf Club*
- Quail Ridge*
- Sterling Village
- Village of Golf*
- Women's Circle
- WXEL radio station

* Originally customers of the South Central Regional Wastewater and Disposal Board; however, the City of Boynton Beach is in the process of taking over these contracts.

City of Delray Beach

The City of Delray Beach's Public Utilities Division operates and maintains the city's wastewater and reclaimed water systems. The city receives reclaimed water from the South Central Regional WWTF and uses it, primarily for irrigation purposes. The reclaimed water supply has largely replaced the irrigation demand met with potable water and permitted withdrawals from the surficial aquifer system. The City's water use permit contains limiting conditions requiring the provision of reclaimed water to four irrigation users (Delray Beach Municipal Golf Course, Hamlet Golf and Country Club, Del-Aire Golf and Country Club, and Lakeview Golf Club). The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Anchor Park
- Barrier island residential areas
- Boy Scout Park
- Berkshire Development Corp.
- Clearbrook
- MLK corridor
- Crosswinds of Delray
- Del-Aire Golf and Country Club
- Delray Beach Municipal Golf Course
- Delray Business Center
- Delray Summit
- Dover House
- Fairways of Delray
- Gabrial Gemayel
- Governor House Apartments
- Grove Association
- Hamlet Golf and Country Club
- HHC Atlantic
- Imperial Manor Condo
- Lakeview Golf Club
- Lift Station 100
- Medians – Homewood Blvd
- North Plant (NW 2nd Ave)
- Ocean Aire Condominiums
- Ocean Place Condominiums
- Ocean Terrace Association
- Ocean Terrace Condominiums
- Pines of Delray Association, East and West
- Pompey Park
- School District of Palm Beach, Atlantic Ave (North and South)
- Sea Fields Club
- St. Mary's Church (Homewood Blvd)
- The Landings
- Verona Woods
- Veterans Park
- VVZ, Inc.
- Wahoo Properties
- Windemere House Condominiums
- Windsor Court

Future Treatment, Disposal, and Reuse

City of Boynton Beach

As the City of Boynton Beach's reclaimed water system expands, reclaimed water is expected to be used for irrigation in more places, replacing current groundwater withdrawals from the surficial aquifer system and potable demand. The ultimate build-out capacity of the reclaimed water system is estimated at 11.00 mgd.

As part of the Ocean Outfall Law, the South Central Regional WWTF is required to reuse a total of 13.30 mgd of treated wastewater by 2025. The cities of Boynton Beach and Delray Beach have agreed to share equally in the additional 7.70 mgd needed to meet the legislative requirement. Therefore, the City of Boynton Beach has proposed to implement the additional 3.85 mgd of reuse by 2025. The City has suggested several potential reclaimed water end users, listed below.

Potential End Users

- Banyan Springs
- Barton Memorial Park
- Bent Tree
- Cascade Lakes
- Colonial Club
- Colonial Estates
- Congress Middle School
- Cypress Creek Golf Course
- Greentree Villas
- Hampshire Gardens
- Indian Hills
- Jaycees Park
- Leisureville Golf Course
- Limetree
- Los Mangos
- Oakwood Lakes
- Palm Chase
- Palmetto Greens Park
- Poinciana Elementary
- Santa Cruz
- Sara Sims Park
- St. Andrews Golf Club
- St. Vincent de Paul Seminary
- Tuscany
- Wilson Park

City of Delray Beach

The City of Delray Beach has an ordinance requiring customers to connect to the reclaimed water system based on proximity to reclaimed water pipelines. As the reclaimed water system expands, reclaimed water is expected to be used for irrigation along the barrier island, replacing current groundwater withdrawals from the surficial aquifer system and potable demand. The ultimate build-out capacity of the reclaimed water system is estimated at approximately 8.00 mgd.

As part of the Ocean Outfall Law, the South Central Regional WWTF is required to reuse a total of 13.30 mgd of treated wastewater by 2025. The cities of Delray Beach and Boynton Beach have agreed to share equally in the additional 7.70 mgd needed to meet the legislative requirement. Therefore, the City of Delray Beach has proposed to implement the additional 3.85 mgd of reuse by 2025. The City has suggested several potential reclaimed water end users, listed below.

Potential End Users

- Banyan Creek Elementary
- Barrier island residential (south of Atlantic Ave)
- Barwick Park
- Carver Middle School
- Carver Recreation Facility
- Cason Cottage
- Catherine Strong Center & Boys and Girls Club
- City Hall
- Currie Commons Park
- Delray Beach Cemetery
- Delray Beach Community Center
- Delray Beach Parks Complex and Tennis Courts
- Elev8 Sports Institute
- Environmental Services Complex
- Fenway Field/Miller Park
- Fire Station #1
- Fire Station #4
- High Point West
- I-95 and Atlantic Ave Interchange
- Imperial Villas
- Lakeside Townhomes
- Merrit Park
- Oakmont
- Old School Square
- Orchardview Elementary
- Orchardview Fire Station (Fire Station #5)
- Orchardview Park
- Pine Grove Elementary/Pine Grove Park
- Pines of Delray North
- Plumosa Elementary
- Plumosa High School
- Police station/courthouse/library
- Rabbit Hollow
- S.D. Spady Elementary School
- Shady Woods
- Toussaint L'ouverture High School for the Arts
- Trinity Lutheran School
- Verano
- Village Academy for the Arts
- Volem Center

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**24.00 mgd**	**FDEP-Permitted Treatment Capacity**	**24.00 mgd**
Total Treated Wastewater	**17.37 mgd**	**Total Treated Wastewater**	**21.89 mgd**
Disposal		Disposal	
Total	10.36 mgd	Total	8.59 mgd
Deep Well Injection	10.34 mgd	Deep Well Injection	8.56 mgd
Ocean Outfall	0.02 mgd	Ocean Outfall	0.03 mgd
Reuse		Reuse	
Total	7.01 mgd	Total	13.30 mgd
Irrigation	6.84 mgd	Irrigation	13.09 mgd
At Facility	0.17 mgd	Other Uses	0.21 mgd
Reuse Percentage	**40%**	**Reuse Percentage**	**61%**

[a] The utility did not provide projected 2040 flows. Flows were estimated based on the applicable percent change in population from 2016 to 2040 and the Ocean Outfall Law requirements.

Wellington Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Village of Wellington's Utilities Department owns, operates, and maintains the Wellington WWTF, which serves the village with wastewater collection services, treatment, and water reuse. The facility has an FDEP-permitted capacity of 6.50 mgd, with an annual average daily flow of 3.59 mgd in 2016. Approximately 0.49 mgd of the treated wastewater were reused in 2016, and 3.10 mgd were disposed of via deep well injection.

Reclaimed water from the Wellington WWTF is used primarily for irrigating local parks and road medians and hydrating a 30-acre environmental enhancement adjacent to the WWTF. The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Boys and Girls Club Park
- K-Park
- Olympia Park
- Tigershark Cove Park
- Town Center
- Village Park
- Peaceful Waters Sanctuary

Future Treatment, Disposal, and Reuse

The Village is completing a master plan that is expected to recommend continued supply of reclaimed water to current users and may increase water reuse in the future. The utility has suggested several potential reclaimed water end users, listed below.

Potential End Users

- Big Blue Trace
- Forest Hill Blvd
- Greenview Shores Blvd
- International Polo
- Old Polo (a and b)
- Pierson Polo
- Polo Golf Course
- Polo South
- Southshore Blvd (North)
- Southshore Blvd (South)
- Wellington Trace West
- Wellington Trace East

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**6.50 mgd**	**FDEP-Permitted Treatment Capacity**	**6.50 mgd**
Total Treated Wastewater	**3.59 mgd**	**Total Treated Wastewater**	**4.20 mgd**
Disposal		Disposal	
Deep Well Injection	3.10 mgd	Deep Well Injection	3.63 mgd
Reuse		Reuse	
Irrigation	0.49 mgd	Irrigation	0.57 mgd
Reuse Percentage	**14%**	**Reuse Percentage**	**14%**

[a] The utility did not provide projected 2040 flows. Flows were estimated based on the applicable percent change in population from 2016 to 2040.

Broward County Wastewater Treatment Facilities

Broward County North Regional Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

Broward County Water and Wastewater Services operates the Broward County North Regional WWTF in the City of Pompano Beach, which provides wastewater services for northern Broward County. The facility has an FDEP-permitted capacity of 95.00 mgd. In 2016, the annual average daily wastewater flow at the facility was 70.50 mgd. Approximately 4.30 mgd of the treated wastewater were reused at the facility or at adjacent facilities for irrigation, industrial processes, or cooling water.

In 2016, treated wastewater was disposed of via deep injection wells (38.90 mgd) or ocean outfall (27.50 mgd). Of the water sent to the ocean outfall, 2.38 mgd was captured by the City of Pompano Beach for further treatment and reuse. In 2016, 4.30 mgd of treated wastewater were reused at the facility for industrial purposes (4.10 mgd) and irrigation (0.20 mgd). The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Broward County Septage Receiving Facility
- Broward County North Regional WWTF
- Pompano Beach Park of Commerce
- City of Coconut Creek

Future Treatment, Disposal, and Reuse

The Ocean Outfall Law mandates that 60 percent of treated wastewater disposed of through ocean outfalls must be reused. For this WWTF, the requirement translated to an additional 21.45 mgd of reuse (above the 2008 baseline flow), for a total reuse of 25.95 mgd by 2025. In 2016, Broward County entered into an agreement with Palm Beach County to distribute up to 10.50 mgd of reclaimed water into southern Palm Beach County for irrigation. An additional 3.00 mgd will be made available to North Springs Improvement District residents in northwestern Broward County. The City of Coconut Creek also is receiving up to 1.44 mgd of reclaimed water and plans to receive up to 3.00 mgd in the future. Additional local irrigation end users are expected to utilize the remaining reuse supply.

Recent activities will promote future water reuse within Broward County. In 2016, the County and the City of Pompano Beach signed an agreement for the City to treat wastewater from the County's ocean outfall pipeline and distribute up to 1.00 mgd of reclaimed water for irrigation in the unincorporated Pompano Highlands neighborhood. A 2017 County reclaimed water ordinance established mandatory water reuse zones to facilitate future customer connections. Additionally, the County's Environmental Planning & Community Resilience Division is updating its 2014 regional water reuse master plan to evaluate increased water reuse throughout the county. The utility has suggested some potential reclaimed water end users, listed below.

Potential End Users

- City of Coconut Creek
- Pompano Highlands
- Larger end users in northern Broward County and southern Palm Beach County (e.g., golf courses, parks, schools)

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**95.00 mgd**	**FDEP-Permitted Treatment Capacity**	**95.00 mgd**
Total Treated Wastewater	**70.50 mgd**	**Total Treated Wastewater**	**75.00 mgd**
Disposal		Disposal	
Total	66.40 mgd[a]	Total	49.00 mgd
Deep Well Injection	38.90 mgd	Deep Well Injection	49.00 mgd
Ocean Outfall	27.50 mgd	Ocean Outfall[b]	0.00 mgd
Reuse		Reuse	
Total	4.30 mgd[a]	Irrigation	26.00 mgd
Industrial	4.10 mgd		
Irrigation	0.20 mgd		
Reuse Percentage	**6%**	**Reuse Percentage**	**35%**

a As reported in the *2016 Reuse Inventory* (FDEP 2017). Disposal and reuse flows may include flows not included in the total treated wastewater flow.
b Disposal through ocean outfall still is expected to occur during wet weather periods.

Cooper City Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Cooper City Utility Department operates the Cooper City WWTF, which has an FDEP-permitted capacity of 4.27 mgd and provides wastewater services to customers in the city and small sections of Davie and Southwest Ranches. In 2016, the annual average daily flow to the facility was 2.50 mgd. A contract between Cooper City and the City of Hollywood requires treated wastewater be sent to the Hollywood Southern Regional WWTF. In 2016, 1.72 mgd of treated wastewater were sent to Hollywood. Treated wastewater from Cooper City has a lower salinity than from the Hollywood facility and, therefore, is preferable for reuse applications. Cooper City benefits by sending its treated wastewater to Hollywood for reuse or disposal.

Future Treatment, Disposal, and Reuse

Cooper City has a National Pollutant Discharge Elimination System permit with FDEP for its discharges through the Hollywood ocean outfall. Therefore, Cooper City is obligated to meet the Ocean Outfall Law reuse requirements. Based on 2008 flows to the ocean outfall, the Cooper City WWTF is required to reuse 0.90 mgd of treated wastewater by 2025. The Cooper City WWTF does not have plans to implement a water reuse system within the city, and instead is negotiating an agreement with the City of Miramar to meet the Ocean Outfall Law requirements.

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**4.27 mgd**	**FDEP-Permitted Treatment Capacity**	**4.27 mgd**
Total Treated Wastewater[a]	**2.50 mgd**	**Total Treated Wastewater**[a]	**2.55 mgd**
Disposal		Disposal/Transfer	
Total	2.50 mgd	Total	2.55 mgd
Deep Well Injection	0.78 mgd	Deep Well Injection	0.83 mgd
Pumped to Hollywood	1.72 mgd	Pumped to Hollywood	1.72 mgd
Reuse		Reuse	
In Cooper City[b]	0.00 mgd	In Cooper City or Miramar[b,c]	1.00 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**[d]

[a] Treated wastewater from the WWTF is combined with concentrate from the water treatment plant before it is sent to the City of Hollywood or disposed of in deep injection wells.

[b] An unknown amount of water reuse, using wastewater from Cooper City, occurs through the City of Hollywood's system.

[c] Cooper City has entered into an agreement for 1.00 mgd of reuse in Miramar.

[d] If the 1.00 mgd of reuse occurs in Miramar, it will be credited toward Cooper City's ocean outfall legislation requirement but not the reuse percentage for Cooper City.

Coral Springs Improvement District Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Coral Springs Improvement District WWTF has an FDEP-permitted capacity of 7.72 mgd and provides wastewater services to customers within its service area. In 2016, the annual average daily flow from the facility was 5.91 mgd. Treated wastewater from the facility is disposed of via two deep injection wells. The facility also has an on-site rapid infiltration basin for short-term, emergency backup disposal. Coral Springs Improvement District determined water reuse is not feasible at this time.

Future Treatment, Disposal, and Reuse

Coral Springs Improvement District plans to upgrade the WWTF and continue evaluating the potential of producing reclaimed water.

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**7.72 mgd**	**FDEP-Permitted Treatment Capacity**	**8.67 mgd**
Total Treated Wastewater	**5.91 mgd**	**Total Treated Wastewater**	**5.67 mgd**
Disposal		Disposal	
Deep Well Injection	5.91 mgd	Deep Well Injection	5.67 mgd
Reuse		Reuse	
Total	0.00 mgd	Total	0.00 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

Davie Wastewater Treatment Facility/Water Reuse Facility

Existing Treatment, Disposal, and Reuse

The Town of Davie Utilities Department operates the Davie WWTF and Davie WRF. The Davie WWTF treats wastewater and sends it to the Hollywood Southern Regional WWTF, where it is reused or disposed of via deep well injection. The WRF treats wastewater to higher standards and reuses it, primarily for irrigation purposes. Any treated wastewater that is not reused is disposed of via deep well injection. The WWTF has an FDEP-permitted capacity of 4.85 mgd and provides wastewater services to the majority of eastern Davie and the Seminole Tribe of Florida Hard Rock Hotel and Casino Hollywood complex. The Cooper City and Tindall Hammock WWTFs also serve a small portion of the town. The remaining sections of the Town of Davie (predominantly the western portions) are served by Broward County and the cities of Hollywood, Fort Lauderdale, and Sunrise. The WRF has a separate treatment capacity of 3.50 mgd and provides additional treatment to allow reclaimed water delivery to a section of Davie.

In 2016, the annual average daily flow at the Davie WWTF was 1.27 mgd. Through a large user agreement, the Davie WWTF is required to send treated wastewater to the Hollywood facility until 2037. Treated wastewater from Davie has a lower salinity than from the Hollywood facility and, therefore, is preferable for reuse applications. Davie benefits by sending its treated wastewater to Hollywood for reuse or disposal.

In 2016, the annual average daily flow at the Davie WRF was 1.28 mgd. Approximately 0.45 mgd was reused in 2016, with the remaining 0.83 mgd disposed of via deep well injection. The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Nova Southeastern University main campus
- University of Florida Research Center
- WRF processes

Future Treatment, Disposal, and Reuse

The Town of Davie has a National Pollutant Discharge Elimination System permit with FDEP for its discharges through the City of Hollywood's ocean outfall. Therefore, Davie is obligated to meet the Ocean Outfall Law reuse requirements. Based on 2008 flows to the ocean outfall, the Town of Davie Utility Department must reuse 1.10 mgd of treated wastewater by 2025. The Town of Davie's WRF has a current capacity to provide up to 3.50 mgd of reclaimed water for irrigation and industrial uses, enabling the Town to meet this requirement.

Through an increase in treatment capacity, the WRF is expected to provide approximately 5.00 mgd of reclaimed water for irrigation and industrial uses by 2028. The increase in capacity of the WRF will be necessary to treat future flows diverted from the WWTF. Wastewater flows at the WWTF greater than those needed to meet the agreement with Hollywood will be sent to the WRF for reuse. Increased flows from the WRF will allow the Town to meet its Ocean Outfall Law reuse requirement. As part of the Town's reuse program, the Town will explore aquifer recharge and indirect potable reuse in the future. The utility has suggested some potential reclaimed water end users, listed below.

Potential End Users

- Arrowhead Country Club
- Broward College
- Broward County schools
- Davie Bamford Pine Island Park Sports Complex
- Grand Oaks Country Club
- McFatter Technical Center
- Sunforest Complex

FACILITY SUMMARY – DAVIE WWTF

2016		Projected 2040	
FDEP-Permitted Treatment Capacity	**4.85 mgd**	**FDEP-Permitted Treatment Capacity**	**4.85 mgd**
Total Treated Wastewater	**1.27 mgd**	**Total Treated Wastewater**	**3.50 mgd**
Transfer/Disposal		Transfer/Disposal	
Transfer	1.27 mgd	Transfer[a]	3.50 mgd
Reuse[b]		Reuse[b]	
Total	0.00 mgd	Total	0.00 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

[a] Treated effluent is transferred to the Hollywood Southern Regional WWTF or the Davie WRF.
[b] Reuse of wastewater from Davie occurs through the Hollywood Southern Regional WWTF.

FACILITY SUMMARY – DAVIE WRF

2016		Projected 2040	
FDEP-Permitted Treatment Capacity	**3.50 mgd**	**FDEP-Permitted Treatment Capacity**	**7.50 mgd**
Total Treated Wastewater	**1.28 mgd**	**Total Treated Wastewater**	**5.00 mgd**
Disposal		Disposal	
Deep Well Injection	0.83 mgd	Deep Well Injection	0.00 mgd[a]
Reuse		Reuse	
Total	0.45 mgd	Total	5.00 mgd
Irrigation	0.37 mgd	Irrigation	4.00 mgd
At Facility, Toilet Flushing	0.08 mgd	Industrial	1.00 mgd
Reuse Percentage	**35%**	**Reuse Percentage**	**100%**

[a] Disposal through deep well injection still is expected to occur during wet weather periods.

Fort Lauderdale George T. Lohmeyer Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Fort Lauderdale's George T. Lohmeyer WWTF is a central regional facility used to treat all wastewater generated in Port Everglades; the cities of Fort Lauderdale, Wilton Manors, and Oakland Park; and parts of the City of Tamarac, Town of Davie, and unincorporated Broward County. The facility has an FDEP-permitted capacity of 55.70 mgd and a 2016 annual average daily flow of 38.46 mgd. Treated wastewater from the facility is disposed of via five deep injection wells.

The facility does not provide reclaimed water as it is far from traditional reclaimed water users and space to construct the necessary treatment facilities is limited. In addition, the treated wastewater has elevated chloride concentrations limiting its viability as reclaimed water. Therefore, the city determined that water reuse alternatives are not feasible at this time.

Future Treatment, Disposal, and Reuse

The City of Fort Lauderdale will continue to consider water reuse, particularly options that can be used to help develop alternative water supplies. Indirect potable reuse systems may be an option because of the dual benefits of providing more disposal capacity and augmenting local water supplies.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**55.70 mgd**	**FDEP-Permitted Treatment Capacity**	**62.00 mgd**
Total Treated Wastewater	**38.46 mgd**	**Total Treated Wastewater**	**52.84 mgd**
Disposal		Disposal	
Deep Well Injection	38.46 mgd	Deep Well Injection	52.84 mgd
Reuse		Reuse	
Total	0.00 mgd	Total	0.00 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

[a] Projections for 2026 were provided. Flows were estimated based on the applicable percent change in population from 2025 to 2040.

Hollywood Southern Regional Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Hollywood Department of Public Utilities owns and operates the Hollywood Southern Regional WWTF. The facility has an FDEP-permitted capacity of 55.50 mgd and provides wastewater services for the City of Hollywood and southern Broward County. In 2016, the annual average daily flow of treated wastewater from the facility was 37.67 mgd. That treated wastewater was disposed of via deep well injection (22.65 mgd) or ocean outfall (15.02 mgd). The facility receives additional treated wastewater from the Town of Davie and Cooper City, which is lower in salinity making it reusable. In 2016, approximately 5.43 mgd of that treated wastewater was reused for irrigation (2.54 mgd) or in-facility processes (2.89 mgd). Irrigation end users included six golf courses, four parks, and one school. The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Diplomat Country Club
- Eco Grande Golf Course
- Emerald Hills Golf Course
- City nursery (from tanker truck)
- David Park
- Dowdy Field
- Hillcrest Country Club
- Hollywood Beach Golf Course
- Hollywood Blvd median
- Lincoln Park Elementary School
- Memorial Regional Hospital East Campus
- Orangebrook Country Club
- Rotary Park
- Townhomes of Emerald Hills
- U.S. Highway 1 median

Future Treatment, Disposal, and Reuse

The Hollywood Southern Regional WWTF has one of the two ocean outfalls in Broward County used to dispose of treated wastewater. The Ocean Outfall Law mandates that 60 percent of treated wastewater disposed of through ocean outfalls must be reused. For Hollywood, the requirement translated to an additional 10.00 mgd of reuse (above the 2008 baseline flow), for a total reuse of 12.30 mgd by 2025. The utility has suggested some potential reclaimed water end users, listed below.

Potential End Users

- City of Dania Beach
- City of Hallandale Beach
- City of Hollywood remaining green areas
- Topeekeegee Yugnee Park, Sheridan Street, and Park Road
- West Lake Village

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**55.50 mgd**	**FDEP-Permitted Treatment Capacity**	**55.50 mgd**
Total Treated Wastewater[a]	**37.67 mgd**	**Total Treated Wastewater**	**41.00 mgd**
Disposal		Disposal	
Total	37.67 mgd	Total	35.50 mgd
Deep Well Injection	22.65 mgd	Deep Well Injection	35.50 mgd
Ocean Outfall	15.02 mgd	Ocean Outfall[b]	0.00 mgd
Reuse[c]		Reuse	
Total	5.43 mgd	Total	12.30 mgd
Irrigation	2.54 mgd	Irrigation in the City	7.80 mgd
At Facility	2.89 mgd	Contracted Irrigation[d]	4.50 mgd
Reuse Percentage	**14%**	**Reuse Percentage**	**24%**[d]

[a] Does not include treated wastewater flows from the Town of Davie and Cooper City.
[b] The ocean outfall still could be used for emergencies, but deep well injection will be the primary wet weather disposal method.
[c] Due to elevated salinity in the City of Hollywood's wastewater, most reuse occurs using treated wastewater received from the Cooper City and Davie WWTFs.
[d] Hollywood expects to contract with another utility for an additional 4.50 mgd of water reuse to meet their Ocean Outfall Law requirement. This flow will not be included in the City's reuse percentage.

Margate Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Margate's Department of Environmental and Engineering Services operates the Margate WWTF, consisting of adjacent East and West facilities. The WWTF has an FDEP-permitted capacity of 10.10 mgd and provides wastewater services to the entire developed area within city limits and a section of southern Coconut Creek. In 2016, the annual average daily flow from the facility was 7.59 mgd. As of 2016, all treated wastewater was disposed of via deep well injection.

Future Treatment, Disposal, and Reuse

The City of Margate is planning for the design and construction of a 1.50-mgd capacity reclaimed water treatment facility, along with the associated transmission and distribution system piping. The facility will be located within the West WWTF and will produce reclaimed water primarily for irrigation of nearby golf courses and roadway medians and for in-facility processes. The project is on hold and will be re-evaluated based on future demand. The utility has suggested some potential reclaimed water end users, listed below.

Potential End Users

- Carolina Golf Club
- Coral Cay (Colonies of Margate I, II, and III)
- In-facility process water and spray irrigation
- Margate Executive Golf Course
- Oriole Golf and Tennis Club of Margate
- Palm Springs III

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**10.10 mgd**	**FDEP-Permitted Treatment Capacity**	**11.60 mgd**
Total Treated Wastewater	**7.59 mgd**	**Total Treated Wastewater**	**8.50 mgd**
Disposal		Disposal	
Deep Well Injection	7.59 mgd	Deep Well Injection	7.50 mgd
Reuse		Reuse	
Total	0.00 mgd	Irrigation	1.00 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**12%**

Miramar Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Miramar's Utilities Department operates a WWTF that serves the western section of the city. Wastewater collected from the eastern part of the city is sent to the Hollywood Southern Regional WWTF for treatment. The Miramar WWTF has an FDEP-permitted capacity of 12.70 mgd, and in 2016, the annual average daily flow from the facility was 10.25 mgd. Approximately 6.30 mgd of the treated wastewater were disposed of via deep well injection, while 3.95 mgd were reused. Most of the water reuse was for public access irrigation. The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Ansin Sport Complex Avalon
- City hall
- United States General Services Administration building
- Hiatus Road, Miramar Parkway, Southwest 130th Ave, and Southwest 145th Ave medians
- Miramar Park of Commerce (north only)
- Monarch Lakes (common areas)
- Renaissance Middle School
- Villages of Renaissance

Future Treatment, Disposal, and Reuse

The City of Miramar will continue evaluating options for increasing water reuse to help meet the Ocean Outfall Law requirements for the Cities of Hollywood and Cooper City and to help increase water supplies. The city is anticipating that the increased use of reclaimed water within the vicinity of its western wellfield may reduce the stress on the wellfield and decrease permitted water use demands. The utility has suggested some potential reclaimed water end users, listed below.

Potential End Users

- Huntington Park
- Miramar Park of Commerce – Phase V
- Silver Falls
- Trammel Crow Industrial Center
- Vizcaya Park and common area

FACILITY SUMMARY

2016		Projected 2040[a]	
FDEP-Permitted Treatment Capacity	**12.70 mgd**	**FDEP-Permitted Treatment Capacity**	**12.70 mgd**
Total Treated Wastewater	**10.25 mgd**	**Total Treated Wastewater**	**11.89 mgd**
Disposal		Disposal	
Deep Well Injection	6.30 mgd	Deep Well Injection	7.31 mgd
Reuse		Reuse	
Total	3.95 mgd	Irrigation	4.58 mgd[b]
Irrigation	2.93 mgd		
At Facility	1.02 mgd		
Reuse Percentage	**39%**	**Reuse Percentage**	**39%**

[a] The utility did not provide projected 2040 flows. Flows were estimated based on the applicable percent change in population from 2016 to 2040 and the Ocean Outfall Law reuse requirements.

[b] Future water reuse flows could be greater if contracted reuse is implemented by ocean outfall utilities such as Hollywood and Cooper City.

Pembroke Pines Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Pembroke Pines Division of Environmental Services operates the Pembroke Pines WWTF. The facility has an FDEP-permitted capacity of 9.50 mgd and serves the western section of the city. The Hollywood Southern Regional WWTF receives and treats wastewater from the eastern portion of Pembroke Pines. In 2016, the annual average daily treated wastewater flow from the Pembroke Pines WWTF was 6.59 mgd. Treated wastewater from the WWTF is disposed of via deep well injection.

Future Treatment, Disposal, and Reuse

In 2011, the City of Pembroke Pines completed a pilot project evaluating the feasibility of recharging the surficial aquifer system with reclaimed water. Based on the results, the concept was deemed technically feasible, but no further progress was made toward evaluating and implementing aquifer recharge. Additionally, the City is concerned about the potential cost to meet the County's nutrient criteria for phosphorus and nitrogen levels. The City has no plans to implement a water reuse program.

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**9.50 mgd**	**FDEP-Permitted Treatment Capacity**	**9.50 mgd**
Total Treated Wastewater	**6.59 mgd**	**Total Treated Wastewater**	**7.68 mgd**
Disposal		Disposal	
Deep Well Injection	6.59 mgd	Deep Well Injection	7.68 mgd
Reuse		Reuse	
Total	0.00 mgd	Total	0.00 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

Plantation Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Plantation Utilities Department operates and maintains the Plantation WWTF, which serves the entire incorporated area. The facility has an FDEP-permitted capacity of 18.90 mgd. In 2016, the annual average daily flow through the facility was 12.03 mgd. Most of the treated wastewater (10.04 mgd) was disposed of via deep well injection, while 0.68 mgd were reused for treatment processes and irrigation at the facility.

In 2008, the City of Plantation completed a pilot project evaluating potential treatment options to use reclaimed water to recharge the surficial aquifer system. Although the concept is technically feasible from a treatment perspective, costs and regulatory constraints stalled its progress.

Future Treatment, Disposal, and Reuse

The City of Plantation Utilities Department will continue to evaluate options to increase water reuse, including use of reclaimed water for irrigation at the Plantation Preserve and Jacaranda golf courses; however, no water reuse is currently planned.

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**18.90 mgd**	**FDEP-Permitted Treatment Capacity**	**18.90 mgd**
Total Treated Wastewater[a]	**12.03 mgd**	**Total Treated Wastewater**	**15.50 mgd**
Disposal		Disposal	
Deep Well Injection	10.04 mgd	Deep Well Injection	15.50 mgd
Reuse		Reuse	
At Facility	0.68 mgd	Total	0.00 mgd
Reuse Percentage	**6%**	**Reuse Percentage**	**0%**

[a] The reuse system includes one or more activities in which reclaimed water is returned to the WWTF after use and then is available for reuse or disposal.

Pompano Beach Water Reuse Facility

Existing Treatment, Disposal, and Reuse

The City of Pompano Beach Utilities Department operates and maintains a reclaimed water treatment and distribution system named "Our Alternative Supply Irrigation System," referred to as OASIS, but does not have its own WWTF. Instead, Pompano Beach operates its own WRF that diverts a portion of the treated wastewater from the Broward County North Regional WWTF ocean outfall pipeline. The diverted wastewater undergoes further treatment with filtration and high-level disinfection at the Pompano Beach WRF before being reused within the city. The Pompano Beach WRF has an FDEP-permitted capacity of 7.50 mgd. In 2016, the annual average daily flow from the WRF was 2.38 mgd.

The Pompano Beach WRF provides reclaimed water for irrigation of the municipal golf course, Pompano Community Park, landscaping along Federal Highway and Copans Road, city medians, and 793 residential lots east of Dixie Highway into the City of Lighthouse Point. Water reuse by the City of Pompano Beach will contribute to the Broward County North Regional WWTF's 60 percent water reuse requirement by 2025 under the Ocean Outfall Law. The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Citi Centre Mall
- City cemetery
- City Municipal Golf Course
- City nursery
- City parks
- Medians
- Residential areas (within Pompano Beach and Lighthouse Point)
- Sand and Spurs Stables
- Schools

Future Treatment, Disposal, and Reuse

The city intends to continue expanding its treatment capacity and distribution system by adding customers, including residential customers in the eastern section of the city and into the City of Lighthouse Point. In 2011, the city, with Broward County as a partner, implemented a program to complete and pay for the upfront connection costs for single family residential properties. That program continues within the city. In addition, Pompano Beach has a reclaimed water large user agreement with Broward County to provide reclaimed water to residential users within Pompano Highlands, located in the Broward County service area.

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**7.50 mgd**	**FDEP-Permitted Treatment Capacity**	**12.00 mgd**
Total Treated Wastewater[a]	**2.38 mgd**	**Total Treated Wastewater**	**7.44 mgd**
Reuse		Reuse	
Irrigation	2.11 mgd	Irrigation	7.44 mgd
Reuse Percentage	**89%**	**Reuse Percentage**	**100%**

[a] The wastewater not reused (0.27 mgd) was transferred to the Broward County North County Regional WWTF collection system.

Sunrise Wastewater Treatment Facilities

Existing Treatment, Disposal, and Reuse

The City of Sunrise Utilities Department operates and maintains three WWTFs (Southwest, Sawgrass, and Springtree), serving the cities of Sunrise and Weston, the Town of Southwest Ranches, and approximately 60 percent of the Town of Davie.

The Southwest WWTF has an FDEP-permitted capacity of 0.45 mgd, and in 2016, the annual average daily wastewater flow was 0.34 mgd. The facility uses percolation ponds for reuse of some treated wastewater and discharges the remaining wastewater through four percolation ponds. The Sawgrass WWTF has an FDEP-permitted capacity of 20.00 mgd and had an average daily flow of 12.59 mgd in 2016. The Springtree WWTF has an FDEP-permitted capacity of 10.00 mgd and had an average daily flow of 8.01 mgd in 2016. The Sawgrass and Springtree WWTFs do not provide reclaimed water. These two facilities dispose of treated wastewater via deep well injection. Effluent from the Springtree WWTF is sent to the Sawgrass facility for deep well disposal.

Future Treatment, Disposal, and Reuse

The City of Sunrise intends to pursue additional water reuse opportunities, primarily at the Sawgrass WWTF to reduce irrigation demands from potable water supplies and the Biscayne aquifer. At the Southwest WWTF, irrigation and continued groundwater recharge through percolation ponds will be the focus. The City of Sunrise is receiving funding through the SFWMD's Cooperative Funding Program to install a reclaimed water pipeline along Springtree Drive, which will distribute reclaimed water to reuse customers and may provide reclaimed water beyond the City's golf course (e.g., to the Sunrise Country Club and Sunrise Lakes Phase IV condominiums).

FACILITY SUMMARY – SOUTHWEST WWTF			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**0.45 mgd**	**FDEP-Permitted Treatment Capacity**	**2.00 mgd**
Total Treated Wastewater	**0.34 mgd**	**Total Treated Wastewater**	**1.00 mgd**
Disposal		Disposal	
Total	0.00 mgd	Deep Well Injection	0.50 mgd
Reuse		Reuse	
Percolation Ponds	0.34 mgd	Total	0.50 mgd
		Irrigation	0.20 mgd
		Groundwater Recharge	0.20 mgd
		Industrial	0.10 mgd
Reuse Percentage	**100%**	**Reuse Percentage**	**50%**

FACILITY SUMMARY – SAWGRASS WWTF

2016		Projected 2040	
FDEP-Permitted Treatment Capacity	**20.00 mgd**	**FDEP-Permitted Treatment Capacity**	**30.00 mgd**
Total Treated Wastewater	**12.59 mgd**	**Total Treated Wastewater**	**20.00 mgd**
Disposal		Disposal	
Deep Well Injection	12.59 mgd	Deep Well Injection	14.00 mgd
Reuse		Reuse	
Total	0.00 mgd	Total	6.00 mgd
		Irrigation	5.50 mgd
		Industrial	0.50 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**30%**

FACILITY SUMMARY – SPRINGTREE WWTF

2016		Projected 2040	
FDEP-Permitted Treatment Capacity	**10.00 mgd**	**FDEP-Permitted Treatment Capacity**	**15.00 mgd**
Total Treated Wastewater	**8.01 mgd**	**Total Treated Wastewater**	**10.00 mgd**
Disposal		Disposal	
Deep Well Injection[a]	8.01 mgd	Deep Well Injection[a]	10.00 mgd
Reuse		Reuse	
Total	0.00 mgd	Total	0.00 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

[a] Treated wastewater from the Springtree WWTF is transferred to the Sawgrass WWTF for disposal through deep injection wells.

Tindall Hammock Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Tindall Hammock Irrigation and Soil Conservation District operates and maintains a wastewater collection and treatment system that serves a small area within the Town of Davie. The Tindall Hammock WWTF has an FDEP-permitted capacity of 0.60 mgd and had an annual average daily flow of 0.23 mgd in 2016. The treated wastewater is discharged to an on-site borrow pit lake, which recharges the surficial aquifer system.

Future Treatment, Disposal, and Reuse

The Tindall Hammock WWTF is expected to continue using an on-site borrow pit lake for recharge of the shallow aquifer system; however, some irrigation with the reclaimed water is expected in the future.

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**0.60 mgd**	**FDEP-Permitted Treatment Capacity**	**0.60 mgd**
Total Treated Wastewater	**0.23 mgd**	**Total Treated Wastewater**	**0.47 mgd**
Reuse		Reuse	
Borrow Pit Lake	0.23 mgd	Total	0.47 mgd
		Borrow Pit Lake	0.24 mgd
		Irrigation	0.23 mgd
Reuse Percentage	**100%**	**Reuse Percentage**	**100%**

Miami-Dade County Wastewater Treatment Facilities

Homestead Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Homestead Public Works and Engineering Department operates and maintains the Homestead WWTF, which has an FDEP-permitted capacity of 4.50 mgd. The annual average daily flow from the Homestead WWTF was 4.61 mgd in 2016. Excess wastewater flows over 4.50 mgd are pumped to the Miami-Dade South District WWTF. All treated wastewater is discharged to a series of rapid infiltration trenches that recharge the Biscayne aquifer, which constituted 100 percent reuse for the facility in 2016.

Future Treatment, Disposal, and Reuse

The City of Homestead evaluated various alternative water supply projects to meet future growth demands. The city determined it could provide reclaimed water from its WWTF to the city-owned power generation plant for cooling water purposes. The plant would then discharge to rapid infiltration basins, recharging the Biscayne aquifer. Currently, the power generation plant withdraws water from the Biscayne aquifer for its cooling towers. The City will continue evaluating this and other options for increasing the benefits of water reuse.

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**4.50 mgd**	**FDEP-Permitted Treatment Capacity**	**10.00 mgd**
Total Treated Wastewater	**4.61 mgd**	**Total Treated Wastewater**	**10.00 mgd**
Reuse		Reuse	
Rapid Infiltration Basin	4.61 mgd	Total	10.00 mgd
		Rapid Infiltration Basin	8.00 mgd
		Industrial Cooling	2.00 mgd
Reuse Percentage	**100%**	**Reuse Percentage**	**100%**

Miami-Dade Water and Sewer Department Wastewater Treatment Facilities

The Miami-Dade Water and Sewer Department (MDWASD) collects and treats most of the wastewater generated in Miami-Dade County. The MDWASD wastewater service area is divided into three regional districts—North, Central, and South—located in the eastern portion of the county. The MDWASD is planning for a new West District WWTF.

The MDWASD uses 2 ocean outfalls and 21 deep injection wells to dispose of treated wastewater. The North District WWTF uses a combination of ocean outfall and deep well injection for disposal, the Central District WWTF only uses ocean outfall, and the South District WWTF only uses deep well injection. Each facility reuses a small amount of treated wastewater, mostly for in-facility processes. The North District WWTF also provides reclaimed water for irrigation of the Florida International University – Biscayne Bay campus. The MDWASD facilities can divert wastewater flows between WWTFs.

There are two driving factors for increased water reuse in Miami-Dade County. First, the utility is within a designated Water Resource Caution Area (the LEC Planning Area). Water Resource Caution Areas have critical water supply problems or are projected to have critical water supply problems within the next 20 years. Reuse of treated wastewater from domestic WWTFs is required within Water Resource Caution Areas, unless such reuse is not economically, environmentally, or technically feasible.

Second, the Ocean Outfall Law requires 60 percent reuse by 2025. Because all the MDWASD's facilities are interconnected, the three WWTFs are considered one system. Therefore, the MDWASD may meet the reuse requirement on a systemwide basis. The utility must reuse an additional 117.50 mgd of treated wastewater above 2008 baseline flows by 2025, for a total water reuse of 131.50 mgd. The MDWASD's intends to reuse most of the wastewater at the South District WWTF, diverting flows from the North and Central District WWTFs to the South District WWTF. The proposed West District WWTF also is planned to support local reuse projects.

Miami-Dade Central District Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Miami-Dade Central District WWTF serves the area from Northwest 79th Street to the Tamiami Canal, including a portion of the City of Coral Gables to Southwest 156th Street. This district serves the unincorporated areas inside its boundary and the municipalities of Doral, Miami, Miami Beach, Miami Springs, Medley, Coral Gables, South Miami, Bal Harbor, and Key Biscayne. The facility has an FDEP-permitted capacity of 143.00 mgd, and in 2016 had an annual average flow of 123.06 mgd. In 2016, 126.90 mgd of treated wastewater were discharged through the Central District ocean outfall, and 8.46 mgd were reused for in-facility processes (e.g., flushing, wash downs, pump seal lubrication).

Future Treatment, Disposal, and Reuse

To reduce flows to the ocean outfall, the MDWASD will be installing deep injection wells at the Central District WWTF. Wastewater not disposed of at the Central District could be sent south or west for reuse at other locations. The MDWASD is evaluating the options to meet the Ocean Outfall Law reuse requirements.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**143.00 mgd**	**FDEP-Permitted Treatment Capacity**	**83.00 mgd**
Total Treated Wastewater[b]	**123.06 mgd**	**Total Treated Wastewater[b]**	**79.57 mgd[c]**
Disposal		Disposal	
Ocean Outfall	126.90 mgd	Deep Well Injection	79.57 mgd
Reuse		Reuse	
At Facility	8.46 mgd	At Facility	5.47 mgd
Reuse Percentage	**7%**	**Reuse Percentage**	**7%**

[a] Projections for 2027 were provided. Flows were estimated based on the applicable percent change in population from 2025 to 2040.

[b] The reuse system includes one or more activities in which reclaimed water is returned to the WWTF after use and then is available for reuse or disposal.

[c] Based on the projected treatment capacity for the MDWASD Central District WWTF relative to the projected 2040 wastewater flow for all MDWASD facilities (**Table F-3**).

Miami-Dade North District Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Miami-Dade North District WWTF serves an area from the north county line to near Northwest 79th Street and includes unincorporated areas as well as the municipalities of Hialeah, Hialeah Gardens, North Miami, Miami Gardens, Miami Lakes, Miami Shores, Opa-Locka, and North Miami Beach. The facility has three independent process trains: one to treat wastewater with lower chloride concentrations from the western part of the district and two to treat a mixture of wastewaters from the western and coastal areas with higher chloride concentrations. The facility has an FDEP-permitted capacity of 120.00 mgd and had an annual average daily flow of 83.97 mgd in 2016. In 2016, 38.20 mgd of treated wastewater were discharged through ocean outfall and 41.66 mgd were disposed of via four deep injection wells. On average, in 2016, 4.17 mgd of treated wastewater were reused. The utility provided a list of existing primary end users of reclaimed water, shown below.

Primary End Users

- Florida International University – Biscayne Bay campus
- Miami-Dade North District WWTF (in-facility processes)

Future Treatment, Disposal, and Reuse

To reduce flows to the ocean outfall, the MDWASD will be installing deep injection wells at the North District WWTF. Wastewater not disposed of at the North District could be sent south or west for reuse at other locations. The MDWASD is evaluating the options to meet the Ocean Outfall Law reuse requirements.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**120.00 mgd**	**FDEP-Permitted Treatment Capacity**	**85.00 mgd**
Total Treated Wastewater[b]	**83.97 mgd**	**Total Treated Wastewater[b]**	**81.48 mgd[c]**
Disposal		Disposal	
Total	79.86 mgd	Deep Well Injection	81.48 mgd
Ocean Outfall	38.20 mgd		
Deep Well Injection	41.66 mgd		
Reuse		Reuse	
Total	4.17 mgd	At Facility	4.05 mgd
At Facility	3.44 mgd		
Irrigation	0.73 mgd		
Reuse Percentage	**5%**	**Reuse Percentage**	**5%**

[a] Projections for 2027 were provided. Flows were estimated based on the applicable percent change in population from 2025 to 2040.

[b] The reuse system includes one or more activities in which reclaimed water is returned to the WWTF after use and then is available for reuse or disposal.

[c] Based on the projected treatment capacity for the MDWASD North District WWTF relative to the projected 2040 wastewater flow for all MDWASD facilities (**Table F-3**).

Miami-Dade South District Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Miami-Dade South District WWTF serves unincorporated areas between the Tamiami Canal and Southwest 360th Street; the municipalities of Pinecrest, Palmetto Bay, and Florida City; and Homestead Air Force Base. The facility has an FDEP-permitted capacity of 112.50 mgd, and in 2016 had an annual average daily flow of 104.14 mgd. In 2016, 97.28 mgd of treated wastewater were disposed of via deep well injection, while 4.38 mgd were reused for in-facility processes (e.g., flushing, wash downs, pump seal lubrication).

Future Treatment, Disposal, and Reuse

The South District WWTF does not have an ocean outfall. Wastewater is disposed of via deep well injection. The MDWASD is evaluating options to meet the Ocean Outfall Law reuse requirements. One option is to provide reclaimed water to the FPL Turkey Point Plant. The MDWASD and FPL have resolved to work together in evaluating the delivery of reclaimed water from the South District WWTF to the FPL Turkey Point Plant.

Miami-Dade County had committed to reclaimed water use as part of the Comprehensive Everglades Restoration Plan. The MDWASD conducted a pilot project to test different treatment technologies and gain insights into the biological and ecological response of typical wetlands to highly treated effluent. As a result of the pilot project, water reuse for wetland hydration was deemed economically infeasible.

Potential End User

- FPL Turkey Point Plant

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**112.50 mgd**	**FDEP-Permitted Treatment Capacity**	**131.00 mgd**
Total Treated Wastewater[b]	**104.14 mgd**	**Total Treated Wastewater[b]**	**125.58 mgd[c]**
Disposal		Disposal	
Deep Well Injection	97.28 mgd	Deep Well Injection	3.60 mgd
Reuse		Reuse	
At Facility	4.38 mgd	Industrial	121.98 mgd[d]
Reuse Percentage	**4%**	**Reuse Percentage**	**97%**

[a] Projections for 2027 were provided. Flows were estimated based on the applicable percent change in population from 2025 to 2040.
[b] As reported in the *2016 Reuse Inventory* (FDEP 2017). Total treated wastewater flow may include flows not included in the disposal and reuse categories.
[c] Based on the projected treatment capacity for the MDWASD South District WWTF relative to the projected 2040 wastewater flow for all MDWASD facilities (**Table F-3**).
[d] Assumes the remaining water reuse flow for the Ocean Outfall Law reuse requirement will be met by the South District WWTF.

Miami-Dade West District Wastewater Treatment Facility (Planned)

Proposed Treatment, Disposal, and Reuse

The MDWASD plans to construct a West District WWTF, which will include wastewater treatment and storage facilities for wet weather conditions in the central-western area of the county. Reclaimed water produced at this facility could be used as an offset to avoid impacts created by additional groundwater withdrawals at the utility's Southwest wellfield and comply with the regional water availability water use permitting criteria. The MDWASD tentatively scheduled this facility to come on line by 2025. Diversion of wastewater flows from other MDWASD facilities and the resultant reclaimed water produced from the planned facility could be used to meet the Ocean Outfall Law reuse requirements.

FACILITY SUMMARY			
2016[a]		**Projected 2040[b]**	
FDEP-Permitted Treatment Capacity	--	**FDEP-Permitted Treatment Capacity**	**102.00 mgd**
Total Treated Wastewater	--	**Total Treated Wastewater**	**97.78 mgd[c]**
Disposal		Disposal	
Total	--	Deep Well Injection	97.78 mgd
Reuse		Reuse	
Total	--	Total	0.00 mgd[d]
Reuse Percentage	--	**Reuse Percentage**	**0%**

a The West District WWTF was not yet built in 2016.
b Projections for 2027 were provided. Flows were estimated based on the applicable percent change in population from 2025 to 2040.
c Based on the projected treatment capacity for the MDWASD West District WWTF relative to the projected 2040 wastewater flow for all MDWASD facilities (**Table F-3**).
d Assumes the remaining water reuse flow for the Ocean Outfall Law reuse requirement will be met by the South District WWTF.

Monroe County Wastewater Treatment Facilities

Big Coppitt Regional Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The Florida Keys Aqueduct Authority (FKAA) operates and maintains the Big Coppitt Regional WWTF on Rockland Key, which provides service to Big Coppitt, Rockland, Geiger, and Shark keys. The facility has an FDEP-permitted capacity of 0.41 mgd, with an annual average daily flow of 0.15 mgd in 2016. Most of the treated wastewater (0.11 mgd) is disposed of via shallow injection wells, with some (0.04 mgd) used for residential irrigation.

Future Treatment, Disposal, and Reuse

FKAA plans to discontinue use of the Boca Chica Naval Air Station and Key Haven Utility WWTFs and send those wastewater flows to the Big Coppitt WWTF to achieve higher treatment standards through advanced wastewater treatment technology. By 2040, wastewater flows are projected to be 0.48 mgd, with 0.04 mgd of water reuse. Although FKAA does not plan on expanding water reuse at the Big Coppitt WWTF, the utility will continue evaluating reuse feasibility in each wastewater service area.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**0.41 mgd**	**FDEP-Permitted Treatment Capacity**	**0.55 mgd[b]**
Total Treated Wastewater	**0.15 mgd**	**Total Treated Wastewater**	**0.48 mgd**
Disposal		Disposal	
Shallow Well Injection	0.11 mgd	Shallow Well Injection	0.44 mgd
Reuse		Reuse	
Irrigation	0.04 mgd	Irrigation	0.04 mgd
Reuse Percentage	**27%**	**Reuse Percentage**	**8%**

[a] Includes flows from the Boca Chica Naval Air Station and Key Haven Utility WWTFs, which will be diverted to the Big Coppitt WWTF.
[b] Based on projected peak monthly flows.

Boca Chica Naval Air Station Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The United States Navy has an agreement with FKAA to manage the wastewater collection system and treatment facility at the Boca Chica Naval Air Station. The WWTF has an FDEP-permitted capacity of 0.40 mgd, with an annual average daily flow of 0.03 mgd in 2016. Currently, treated wastewater is disposed of through six shallow injection wells.

Future Treatment, Disposal, and Reuse

FKAA plans to discontinue using the Boca Chica Naval Air Station WWTF and will send the wastewater flow to the Big Coppitt WWTF, which will provide advanced wastewater treatment.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**0.40 mgd**	**FDEP-Permitted Treatment Capacity**	**--**
Total Treated Wastewater	**0.03 mgd**	**Total Treated Wastewater**	**--**
Disposal		Disposal	
Shallow Well Injection	0.03 mgd	Total	--
Reuse Percentage	**0%**	**Reuse Percentage**	**--**

[a] Wastewater flows will be diverted to the Big Coppitt WWTF.

Cudjoe Regional Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

FKAA operates and maintains the Cudjoe Regional WWTF. The facility was completed in October 2015, and the collection system is under construction/expansion from Mile Marker 17 to 33 to provide service to Lower Sugarloaf, Upper Sugarloaf, Cudjoe, Summerland, Ramrod, Middle Torch, Big Torch, Little Torch, Big Pine, and No Name keys.

Future Treatment, Disposal, and Reuse

The Cudjoe Regional WWTF will have an average daily design capacity of 0.94 mgd. Because it was designed for build-out, no changes to the permitted capacity are anticipated. Projected flows are expected to be between 0.75 and 0.84 mgd, with disposal through deep well injection. Although FKAA does not have plans for water reuse at the Cudjoe Regional WWTF, the utility will continue evaluating reuse feasibility in each wastewater service area.

FACILITY SUMMARY			
2016[a]		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**--**	**FDEP-Permitted Treatment Capacity**	**0.94 mgd**
Total Treated Wastewater	**--**	**Total Treated Wastewater**	**0.80 mgd**
Disposal		Disposal	
Deep Well Injection	--	Deep Well Injection	0.80 mgd
Reuse		Reuse	
Total	--	Total	0.00 mgd
Reuse Percentage	**--**	**Reuse Percentage**	**0%**

[a] The Cudjoe Regional WWTF was not in operation in 2016.

Duck Key (Hawk's Cay) Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

Duck Key is a small community consisting of five islands east of the City of Marathon in unincorporated Monroe County. FKAA acquired the Duck Key Utility service area in 2006, which includes Hawk's Cay Resort, Conch Key, and a residential area. The Duck Key WWTF provides service to the area and has an FDEP-permitted capacity of 0.27 mgd, with an annual average daily flow of 0.15 mgd in 2016. The Duck Key facility reused 0.07 mgd for irrigation and disposed of 0.10 mgd via shallow injection wells in 2016. The Duck Key WWTF was upgraded in 2012 to advanced wastewater treatment standards.

Future Treatment, Disposal, and Reuse

FKAA does not anticipate changes to the permitted capacity of the Duck Key WWTF, as it was designed for build-out. There are no plans to expand the existing water reuse system.

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**0.27 mgd**	**FDEP-Permitted Treatment Capacity**	**0.27 mgd**
Total Treated Wastewater	**0.15 mgd**	**Total Treated Wastewater**	**0.23 mgd**
Disposal		Disposal	
Shallow Well Injection	0.10 mgd	Shallow Well Injection	0.16 mgd
Reuse		Reuse	
Irrigation	0.07 mgd[a]	Irrigation	0.07 mgd
Reuse Percentage	**47%**	**Reuse Percentage**	**30%**

[a] Supplemented with 0.02 mgd of potable water.

Key Colony Beach Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The City of Key Colony Beach operates and maintains a wastewater collection and treatment system to serve the city. The Key Colony Beach WWTF has an FDEP-permitted capacity of 0.34 mgd, with an annual average daily flow of 0.19 mgd in 2016. In 2016, 0.03 mgd of the treated wastewater were reused and 0.16 mgd were disposed of via shallow injection wells.

Although the wastewater is relatively high in salinity, it is treated using reverse osmosis, which is cheaper than buying potable water from FKAA for irrigation.

Primary End User

- Key Colony Beach Golf Course
- City parks (using trucks)

Future Treatment, Disposal, and Reuse

The Key Colony Beach WWTF plans to upgrade the reverse osmosis system to allow for higher-quality effluent and possibly provide additional reclaimed water to irrigate the Key Colony Beach Golf Course and city parks. There is no projected growth in water reuse.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**0.34 mgd**	**FDEP-Permitted Treatment Capacity**	**0.34 mgd**
Total Treated Wastewater	**0.19 mgd**	**Total Treated Wastewater**	**0.19 mgd**
Disposal		Disposal	
Shallow Well Injection	0.16 mgd	Shallow Well Injection	0.16 mgd
Reuse		Reuse	
Irrigation	0.03 mgd	Irrigation	0.03 mgd
Reuse Percentage	**16%**	**Reuse Percentage**	**16%**

[a] The utility did not provide projected 2040 flows. Flows are expected to remain the same as 2016, given no notable increase in potable water use.

Key Haven Utility Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

FKAA operates and maintains the Key Haven WWTF. The facility has an FDEP-permitted capacity of 0.20 mgd, with an annual average daily flow of 0.10 mgd in 2016. All the treated wastewater is disposed of via shallow injection wells.

Future Treatment, Disposal, and Reuse

FKAA plans to discontinue using the Key Haven WWTF and will send the wastewater flow to the Big Coppitt WWTF, which will provide advanced water treatment.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**0.20 mgd**	**FDEP-Permitted Treatment Capacity**	**--**
Total Treated Wastewater	**0.10 mgd**	**Total Treated Wastewater**	**--**
Disposal		Disposal	
Shallow Well Injection	0.10 mgd	Total	--
Reuse Percentage	**0%**	**Reuse Percentage**	**--**

[a] Wastewater flows will be diverted to the Big Coppitt WWTF.

Key Largo Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The State of Florida created the Key Largo Wastewater Treatment District in 2002. The district operates and maintains a wastewater collection and treatment system that serves an area generally from the north end of the Florida Keys at the Miami-Dade County line extending south and west to Tavernier Creek, excluding the community of Ocean Reef. The Key Largo WWTF recently started accepting wastewater from Islamorada. The facility has an FDEP-permitted capacity of 2.30 mgd, with an annual average daily flow of 1.42 mgd in 2016. Currently, all the treated wastewater is disposed of via shallow injection wells.

Future Treatment, Disposal, and Reuse

The Key Largo Wastewater Treatment District does not have plans to reuse treated wastewater. Wastewater will continue to be disposed of via shallow injection wells.

FACILITY SUMMARY			
2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**2.30 mgd**	**FDEP-Permitted Treatment Capacity**	**2.30 mgd**
Total Treated Wastewater	**1.42 mgd**	**Total Treated Wastewater**	**1.42 mgd**
Disposal		Disposal	
Shallow Well Injection	1.42 mgd	Shallow Well Injection	1.42 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

[a] The utility did not provide projected 2040 flows. Flows are expected to remain the same as 2016, given no notable increase in potable water use.

Key West – Richard A. Heyman Environmental Protection Facility

Existing Treatment, Disposal, and Reuse

The City of Key West Utilities Department owns a wastewater collection and treatment system known as the Richard A. Heyman Environmental Protection Facility. The facility serves the city and is located on Fleming Key just off the island of Key West. It has an FDEP-permitted capacity of 10.00 mgd and an annual average flow of 4.20 mgd in 2016. Treated wastewater is disposed of via two deep injection wells.

Future Treatment, Disposal, and Reuse

The City of Key West does not have plans to reuse wastewater. Although the WWTF treats water to advanced water treatment standards, the relatively high salinity of the treated wastewater makes it difficult to reuse, especially for irrigation.

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**10.00 mgd**	**FDEP-Permitted Treatment Capacity**	**10.00 mgd**
Total Treated Wastewater	**4.20 mgd**	**Total Treated Wastewater**	**4.40 mgd**
Disposal		Disposal	
Deep Well Injection	4.20 mgd	Deep Well Injection	4.40 mgd
Reuse		Reuse	
Total	0.00 mgd	Total	0.00 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**0%**

Key West Resort Utilities Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

Key West Resort Utilities operates and maintains a wastewater collection and treatment system that serves southern Stock Island. The facility has an FDEP-permitted capacity of 0.50 mgd. The average flow in 2016 was 0.40 mgd. In 2016, 0.12 mgd of the treated wastewater were reused and 0.28 mgd were disposed of via three shallow injection wells. The facility pumps reclaimed water to a percolation pond for irrigation at the Key West Country Club. Reclaimed water also is provided to the Monroe County Detention Center for nonpotable purposes (e.g., toilet flushing).

Primary End Users

- Key West Country Club
- Monroe County Detention Center

Future Treatment, Disposal, and Reuse

Key West Resort Utilities expanded distribution capabilities to provide reclaimed water to a school, a hospital, and a college. However, these potential users have not yet agreed to accept the reclaimed water.

FACILITY SUMMARY

2016		**Projected 2040[a]**	
FDEP-Permitted Treatment Capacity	**0.50 mgd**	**FDEP-Permitted Treatment Capacity**	**0.85 mgd**
Total Treated Wastewater	**0.40 mgd**	**Total Treated Wastewater**	**0.40 mgd**
Disposal		Disposal	
Shallow Well Injection	0.28 mgd	Shallow Well Injection	0.28 mgd
Reuse		Reuse	
Total	0.12 mgd	Total	0.12 mgd
Golf Course Irrigation	0.11 mgd	Irrigation	0.11 mgd
Toilet Flushing	0.01 mgd	Toilet Flushing	0.01 mgd
Reuse Percentage	**30%**	**Reuse Percentage**	**30%**

[a] The utility did not provide projected 2040 flows. Flows are expected to remain the same as 2016, given no notable increase in potable water use.

Marathon Wastewater Treatment Facilities

Existing Treatment, Disposal, and Reuse

The City of Marathon Utility Department oversees a series of wastewater collection and treatment systems. The area served by the Marathon WWTFs spans from the east end of the Seven Mile Bridge eastward to Tom's Harbor Bridge and includes Knight's Key, Vaca Key, Boot Key, the Sombrero area, Fat Deer Key, Coco Plum, Long Point Key, Little Crawl Key, Crawl Key, Valhalla Island, and Grassy Key. The facilities have a combined capacity of 1.50 mgd and treated 0.84 mgd in 2016. Since incorporating in 1999, Marathon pursued a citywide sewer system and determined that a system of force mains combined with vacuum collection systems is best suited for the area. The City is under a consent order to improve the collection and treatment system. None of the facilities are producing reuse-quality water.

Wastewater services are divided into seven service areas:

- **Service Area 1:** Knight's Key (entire island) – Wastewater flows from this area are pumped to Service Area 3.
- **Service Area 2:** Boot Key (entire island) – This area is not planned for development.
- **Service Area 3:** Vaca Key West (11th Street to 39th Street) – The wastewater collection systems and the WWTF are complete and in operation.
- **Service Area 4:** Vaca Key Central (39th Street to 60th Street) – The wastewater collection systems and the WWTF were completed in March 2010. Although initial elevated chloride levels inhibited the distribution of the reclaimed water, it is used for park facility irrigation.
- **Service Area 5:** Vaca Key East (60th Street to Vaca Cut) – The wastewater collection systems and WWTF expansion are complete. Property owners have been notified to connect to the system.
- **Service Area 6:** Fat Deer Key West-Coco Plum (Vaca Cut to Coco Plum) – The wastewater collection system is complete. The WWTF is operating and connections continue.
- **Service Area 7:** Grassy Key (Fat Deer Key East through Grassy Key) – The collection system and WWTF are complete and in operation.

Future Treatment, Disposal, and Reuse

The City of Marathon is considering water reuse in the future, possibly 25 percent reuse by 2040. However, the City must complete upgrades to the collection and treatment systems and resolve issues with elevated salinity. The wastewater treatment facilities within service areas 3, 4, 5, and 7 are capable of producing reclaimed water. The utility has suggested some potential reclaimed water end users, listed below.

Potential End Users

- Marathon High School (Service Area 4)
- Parks and event fields (Service Area 3)
- Sombrero Beach (Service Area 4)
- Sombrero Country Club (Service Area 4)

FACILITY SUMMARY

2016		Projected 2040[a]	
FDEP-Permitted Treatment Capacity	**1.50 mgd**	**FDEP-Permitted Treatment Capacity**	**1.50 mgd**
Total Treated Wastewater	**0.84 mgd**	**Total Treated Wastewater**	**0.93 mgd**
Disposal		Disposal	
Shallow Well Injection	0.84 mgd	Shallow Well Injection	0.70 mgd
Reuse		Reuse	
Total	0.00 mgd	Irrigation	0.23 mgd
Reuse Percentage	**0%**	**Reuse Percentage**	**25%**

[a] Projections are for 2036.

North Key Largo (Ocean Reef) Wastewater Treatment Facility

Existing Treatment, Disposal, and Reuse

The North Key Largo Utility Corporation operates and maintains a wastewater collection and treatment system serving the Ocean Reef community in North Key Largo. The North Key Largo WWTF facility has an FDEP-permitted capacity of 0.50 mgd, with an annual average daily flow of 0.24 mgd in 2016. The existing water reuse system requires a minimum flow at the WWTF, which is not available 90 percent of the time due to the seasonal use of the property. In 2016, a small flow (0.03 mgd) was reused for golf course irrigation. The remaining flow (0.21 mgd) was disposed of via shallow injection wells.

Primary End User

- Ocean Reef Golf Club (Card Sound Golf Course)

Future Treatment, Disposal, and Reuse

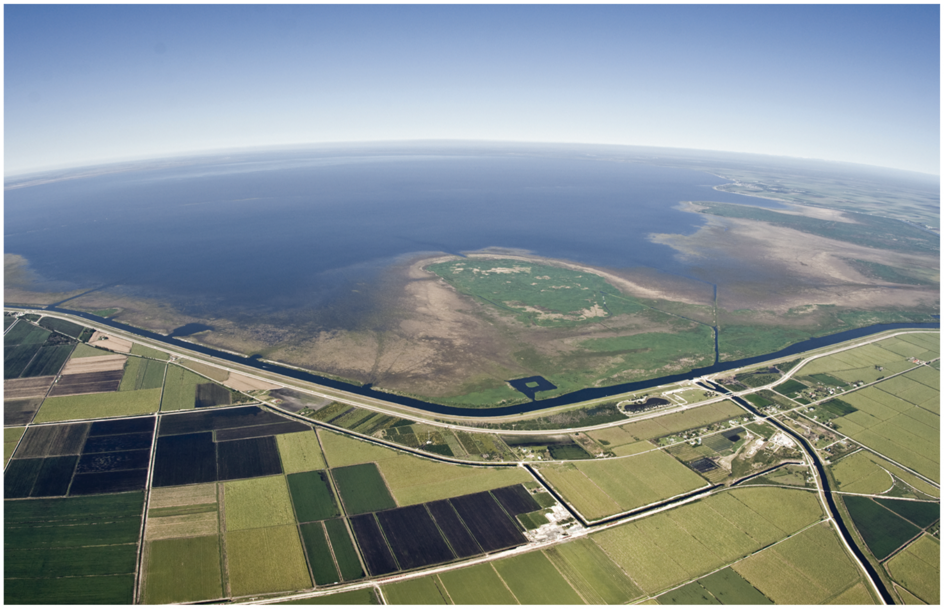
The treatment capacity of the North Key Largo WWTF is expected to remain the same (0.50 mgd) to 2040. Wastewater flows are not expected to increase in the future. Because of the seasonal nature of the property and the limitations of the water reuse system, no major reuse is expected in the future. If water reuse does occur, it would be used for irrigation at the golf course. Shallow injection wells will continue to be the primary means of disposal.

FACILITY SUMMARY			
2016		**Projected 2040**	
FDEP-Permitted Treatment Capacity	**0.50 mgd**	**FDEP-Permitted Treatment Capacity**	**0.50 mgd**
Total Treated Wastewater	**0.24 mgd**	**Total Treated Wastewater**	**0.26 mgd**
Disposal		Disposal	
Shallow Well Injection	0.21 mgd	Shallow Well Injection	0.26 mgd
Reuse		Reuse	
Irrigation	0.03 mgd	Irrigation	0.00 mgd
Reuse Percentage	**12%**	**Reuse Percentage**	**0%**

REFERENCES

FDEP. 2017. *2016 Reuse Inventory.* Water Reuse Program, Florida Department of Environmental Protection, Tallahassee, FL.

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



South Florida Water Management District

Committed to managing and protecting our region's water resources

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