

Utilities of Concern in the
Lower East Coast Region
and
Lake Okeechobee Service Area
September 27, 2007



Water Shortage Analysis Team
South Florida Water Management District

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INTRODUCTION

South Florida is experiencing one of the driest times in history. Water levels in the south Florida regional water management system are critically low and rainfall is projected to be below normal in the coming months. This regional water management system is the primary water supply source to the Lower East Coast region during the dry season. Major canals drain southward from Lake Okeechobee, providing needed water deliveries to manage groundwater levels east of the Water Conservation Areas (WCAs), recharge wellfields, supply water users, and prevent saltwater intrusion to the Surficial Aquifer System. Water availability from Lake Okeechobee and the WCAs is well below average for this time of year. The potential for delivering water from Lake Okeechobee and the regional system to the coast is becoming extremely limited.

Several public water systems withdraw water directly from Lake Okeechobee, the C-43 Canal or local surface waters to meet their needs, including Lee County Olga, U.S. Sugar–Clewiston, Okeechobee Utilities Authority and the cities of Belle Glade, Pahokee, South Bay and West Palm Beach. Many other public water supply systems in the Lower East Coast region are dependent on regional water deliveries to recharge wellfields and impede the movement of saltwater inland during dry times. If water levels cannot be maintained in the coastal canals, the potential for inland movement of the saltwater interface increases. Several of the utilities in this region have wellfields located in close proximity to the coast and the existing saltwater interface. Any movement of the saltwater interface could contaminate these wellfields and jeopardize their role as a water supply source.

Shifting demands from eastern facilities to western facilities, away from the saltwater interface, was recommended in the *Central and South Florida Project Comprehensive Review Study* (C&SF Restudy) for some coastal public water supply utilities in the LEC Planning Area. This included the following utilities: Riviera Beach, Lake Worth, Lantana, Manalapan, Boca Raton and Florida City. In Palm Beach County, some utilities have developed western wellfields to shift demands from coastal wellfields, which affords some protection from saltwater intrusion. In Broward County, some utilities have interconnects that allow shifting coastal withdrawals to western regional wellfields.

The towns of Manalapan and Highland Beach now have operational Floridan Aquifer reverse osmosis facilities. North Miami Beach and Lake Worth are constructing Floridan Aquifer and reverse osmosis treatment systems, scheduled for completion in the summer of 2007 and summer of 2008 respectively. Floridan Aquifer and reverse osmosis treatment systems are under construction to serve several Lake Region communities: Palm Beach County's Lake Region facility will serve the cities of Belle Glade, Pahokee and South Bay, and is scheduled to be operational in the summer of 2008. Clewiston's Floridan Aquifer and reverse osmosis treatment system is planned for completion in late summer 2007.

PURPOSE

The purpose of this document is to provide information about: the utilities that use surface water or have coastal wellfields in the Lower East Coast region and Lake Okeechobee Service Area; associated treatment facilities; interconnects with other utilities; and, current utility contingency plans, should a water source become unable to support user needs. Contingency plans will be evaluated on a regional basis, and areas where further work is needed will be identified. The utility information in this document was compiled from water use permits, the Lower East Coast Water Supply Plan and communications with the utilities. The utility-specific information was reviewed by the utilities for accuracy and completeness. This document will be amended and updated periodically as needed, especially as updates to contingency plans are provided. Similar documents will be prepared for the Upper East Coast and Lower West Coast regions.

An objective of this effort is to ensure utilities have effective drought contingency plans to address reduced water availability due to inland movement of the saltwater interface or depleted surface water sources. Contingency plans should include strategies for the worst possible scenarios. While several of the utilities have multiple wellfields that can shift their pumpage to wellfields further west, or have an alternative source of water (i.e., Floridan Aquifer) that can be used to meet user needs, the timing and trigger points to effect these shifts needs to be documented. Utility information and individual maps of these utilities, wellfields, service areas, etc. are provided in the Maps section of this document.

UTILITIES OF CONCERN

The Utilities of Concern have been divided into three categories: Coastal Utilities at Risk, Coastal Utilities of Concern and Surface Water Utilities of Concern.

Coastal Utilities at Risk

Coastal Utilities at Risk include utilities with wellfields near the saltwater interface, which do not have a western wellfield, have not developed alternative sources of water, and have limited ability to meet user needs through interconnects with other utilities. The following utilities, in order from north to south, have been determined to be Coastal Utilities at Risk:

- ◆ Lake Worth
- ◆ Lantana
- ◆ Hillsboro Beach
- ◆ Dania Beach
- ◆ Hallandale Beach

- ◆ South Miami-Dade Wellfields
 - Newton
 - Elevated Tank
 - Naranja
 - Leisure City
 - Roberta Hunter
 - Caribbean Park
- ◆ Florida City
- ◆ Homestead
- ◆ Florida Keys Aqueduct Authority

Coastal Utilities of Concern

Utilities that have wellfields near the saltwater interface, which have a western wellfield, and/or an alternative source that is not threatened by saltwater intrusion are categorized as Coastal Utilities of Concern. The following utilities, in order from north to south, have been determined to be Coastal Utilities of Concern:

- ◆ Tequesta (Surficial Aquifer wells)
- ◆ Jupiter (Surficial Aquifer wells)
- ◆ Riviera Beach (east)
- ◆ Manalapan
- ◆ Boynton Beach (east)
- ◆ Delray Beach (east)
- ◆ Boca Raton (east)
- ◆ Deerfield Beach (east)
- ◆ Broward County District 2A
- ◆ Pompano Beach (east)
- ◆ Fort Lauderdale
- ◆ Hollywood (east)
- ◆ North Miami Beach
- ◆ North Miami
- ◆ North and Central Miami-Dade Wellfields
 - Hialeah-Preston (Miami-Dade)
 - Alexander Orr (Miami-Dade)

Surface Water Utilities of Concern

The cities of Belle Glade, Pahokee and South Bay water utilities, as well as U.S. Sugar–Clewiston and Okeechobee Utility Authority, take water directly from Lake Okeechobee for potable water supply and are dependent on the capability of their present water intakes to operate at low lake levels. The Lee County Olga facility withdraws water from the C-43 Canal, which is dependent on deliveries from Lake Okeechobee for salinity management. In addition, the City of West Palm Beach relies on surface water lakes and impoundments for water supply. Without rainfall, the water levels in these sources are considerably lower than normal.

The following utilities have been determined to be Surface Water Utilities of Concern:

- ◆ Okeechobee Utilities Authority
- ◆ Pahokee
- ◆ Belle Glade
- ◆ South Bay
- ◆ Lee County Utilities – Olga
- ◆ U.S. Sugar Corporation – Clewiston
- ◆ West Palm Beach

SENTINEL MONITORING WELL NETWORK

The District has identified over 80 monitoring wells located throughout the District that form the Sentinel Monitoring Well Network. Most of the monitoring wells are owned by the USGS and utilities. The frequency of sampling for these wells has increased to weekly for water levels and chlorides. These data are analyzed to detect the movement and potential for movement of the saltwater interface. These data will principally be provided by utilities required to conduct this monitoring as a condition of their water use permit. Declining water levels and increases in chloride concentrations are indicators that saltwater intrusion is occurring within the aquifer. These observations may lead the South Florida Water Management District (SFWMD or District) to request weekly monitoring from more stations—including utility production wells—to determine the extent of the saltwater intrusion and its impact on the aquifer and potable water quality from the affected utility.

SUMMARY

This assessment reflects the utilities' ability to support water supplies during prolonged drought conditions by using interconnects and other contingency planning. While contingency planning should occur at both the local utility and regional levels, in fact, very few of the utilities have formal written plans for conditions that affect their water supply source.

For those utilities at risk that have no interconnects or ability to move pumpage to western wellfields, a more stringent monitoring program is needed. Saltwater monitoring and weekly pumpage reporting will be used to assess conditions as the drought persists.

For those utilities that have interconnects, several problems have been highlighted. First, the wellfields that are at risk are located in the eastern areas and have limited ability to shift wellfields to the west. Often, these utilities have interconnects with adjoining utilities that are under the same constraints. Since formal agreements between utilities are generally lacking, most are on an as-needed, as-available basis. With increased demands for water during this extremely dry period, many of the utilities are maximizing their water production to meet their own user demands, and do not have water to support other utilities. In addition, many of the utilities have interconnects with one of the larger regional utilities, such as Broward County District 2A. These regional utilities cannot support the demands of all the other utilities needing water.

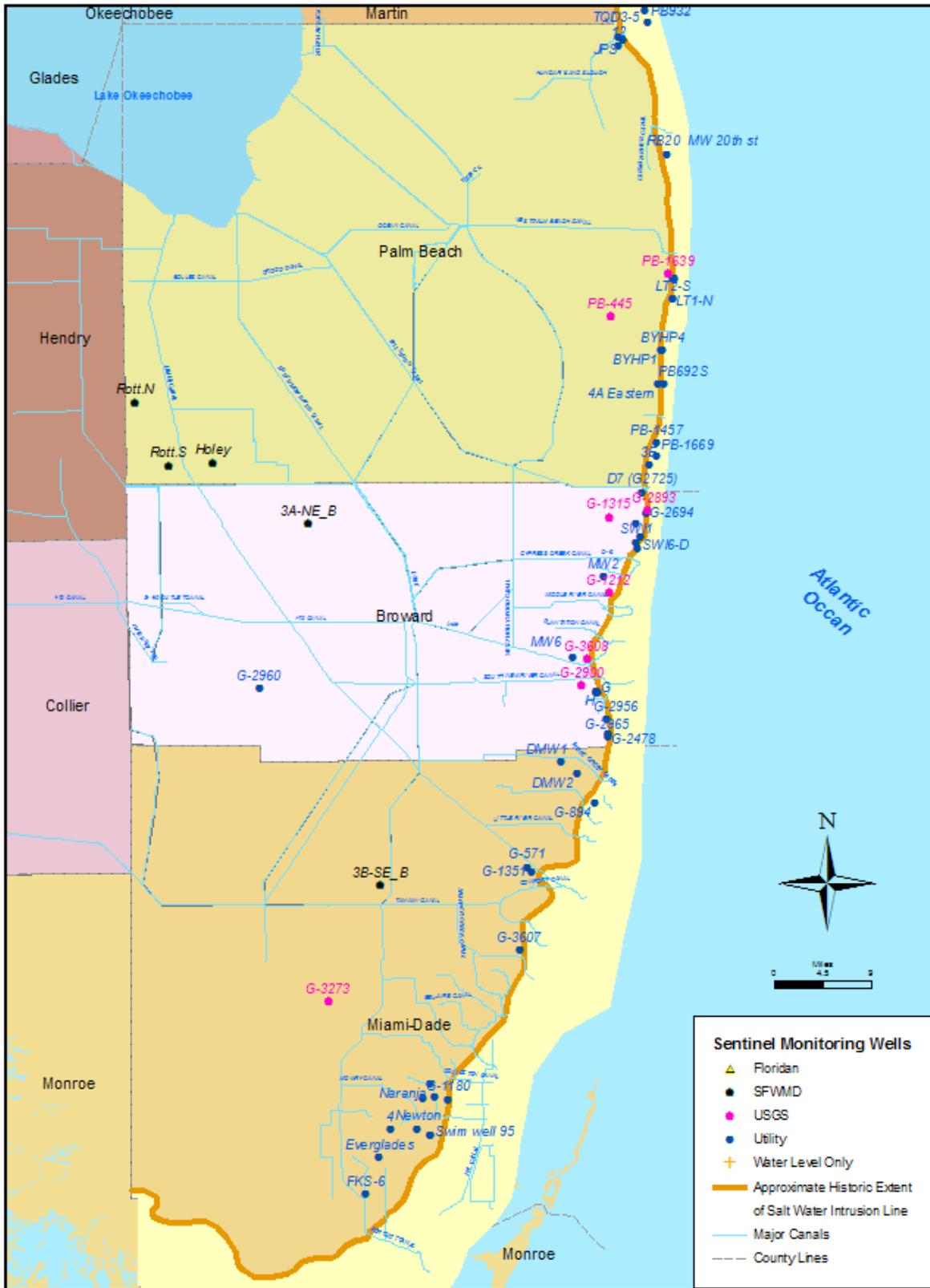
Second, these interconnects are at the extremities of the water distribution systems and have limited ability to convey large volumes of water from one utility to the other. In addition, the ability to convey water from one utility to another is constrained by the pressure differences between the utilities' systems. The receiving utility has to have lower line pressure before the utility providing the water can make any water distribution. It appears that most utilities are relying on an ad-hoc approach to this situation rather than a formalized contingency plan.

Third, the precise location of interconnects in several instances is unknown. Some have detailed maps that may or may not be part of their consumptive use permit. However, this information, if available, is dated or incorrect.

Coastal utilities of concern have western wellfields or have developed an alternative water supply that should provide some opportunity for contingencies. For example, many have shifted their pumpage, as much as possible, to their western wellfield or have expanded their alternative water supply, reducing pumpage along the coast, thus reducing the potential for saltwater intrusion. However, these operational decisions appear to be informal, rather than documented in contingency plans.

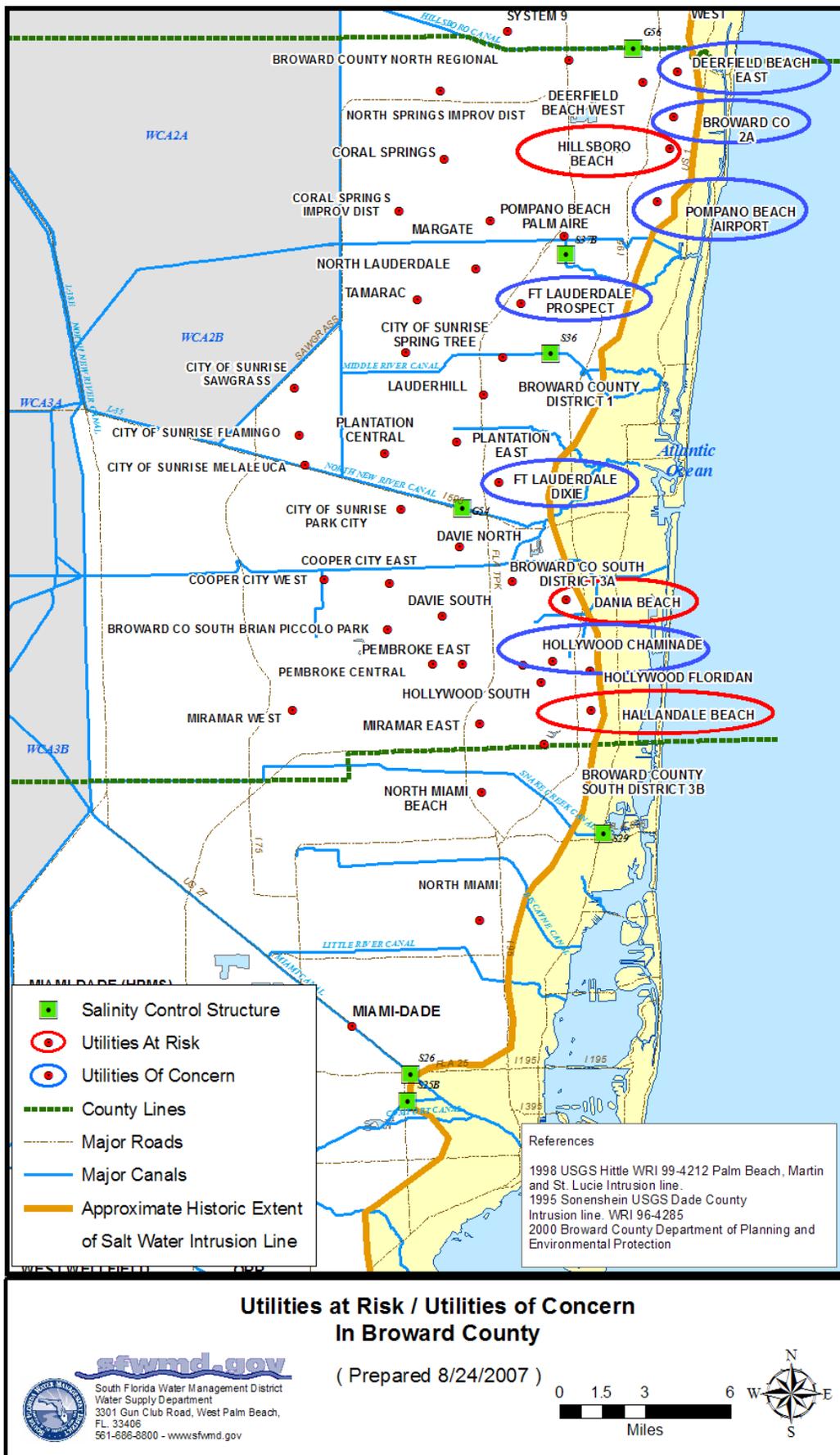
This document will be amended and updated periodically as needed, especially as updates to contingency plans are provided.

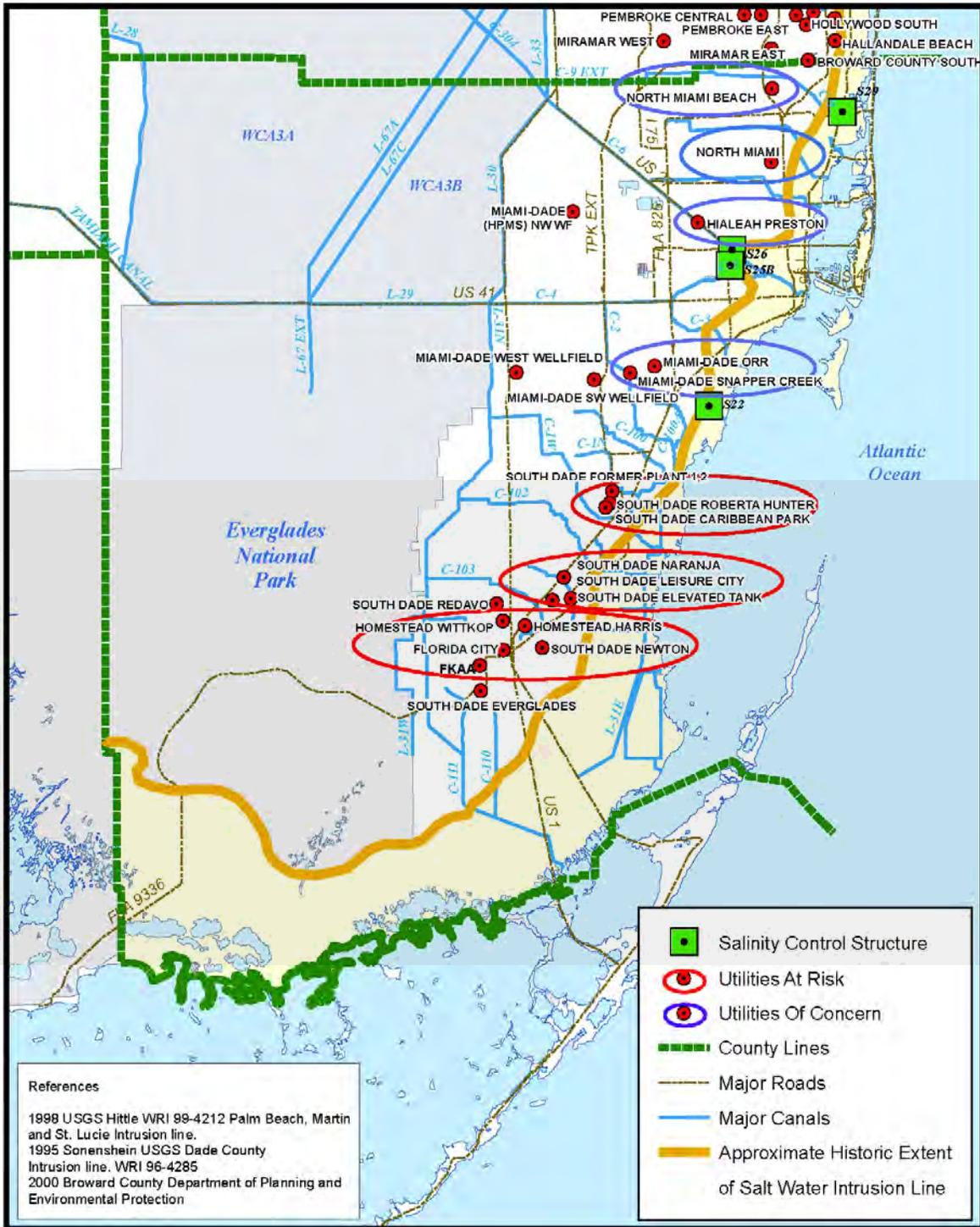
MAPS OF SENTINEL MONITORING WELL NETWORK, COASTAL UTILITIES AT RISK, COASTAL UTILITIES OF CONCERN, AND SURFACE WATER UTILITIES OF CONCERN



**Sentinel Monitoring Wells in
Lower East Coast Region**
(Prepared 6/19/2007)

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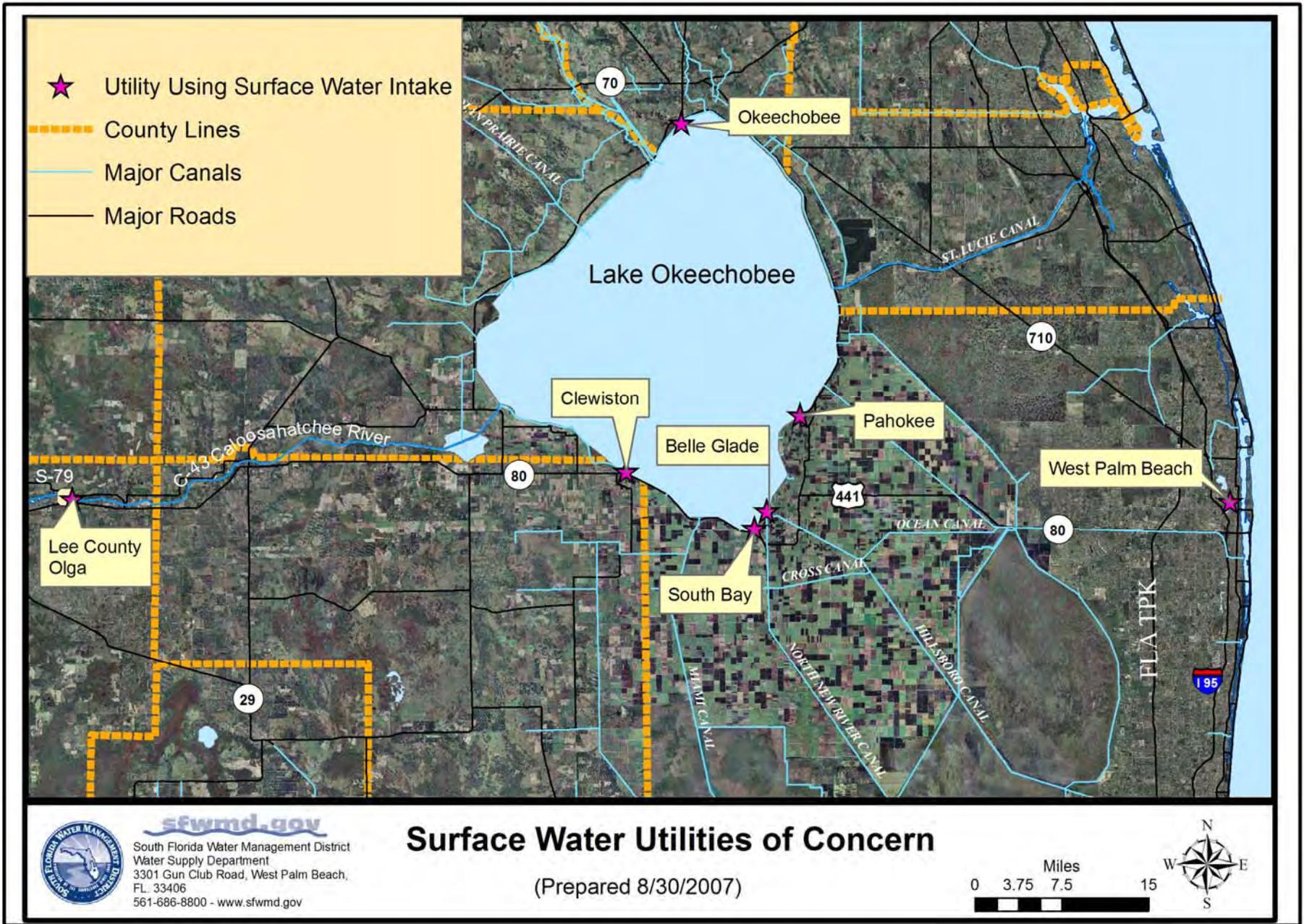


Utilities at Risk / Utilities of Concern In Miami-Dade County (Prepared 5/7/2007)



South Florida Water Management District
Water Supply Department
3301 Gun Club Road, West Palm Beach,
FL 33406
561-688-8800 - www.sfwmd.gov





COASTAL UTILITIES AT RISK: UTILITY SUMMARIES AND WELLFIELD MAPS

LAKE WORTH UTILITIES AUTHORITY

Utility Contact: Robert Douglas, Plant Supervisor (561) 586-1710 rdouglas@lakeworth.org

SFWMD Coordinator: Emily Richardson (561) 682-6824 ehopkins@sfwmd.gov

SFWMD Permit Reviewer: Pending

Water Use Permit #: 50-00234-W Issued: 2/2006 Expires: 1/2026

Source(s): Surficial Aquifer System (Existing); Floridan Aquifer System (Under Construction)

Annual Allocation: 4,405 MG (12.07 MGD)

Max. Month. Allocation: 410.94 MG

2005 Pumpage: 7.27 MGD (2,653 MGY)

* Until the city's Floridan Aquifer capacity is on-line, permitted allocations are restricted to the Surficial Aquifer limitation (7.58 MGD).

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 12.9 MGD

Treatment Method: Lime softening

Supply Sources:

Wellfields: 1

Surficial Aquifer System:

Total Wells: 17 permitted, 13 currently operational

Limitations: Annual Allocation 2,765 MG (through 1/2011), Maximum Monthly Allocation 336 MG (through 1/2011). After 1/2011, when the permitted Floridan Aquifer capacity is expected to be fully realized, Surficial Aquifer System withdrawals are to be scaled back.

Floridan Aquifer System:

Total Wells: 10 permitted, 2 have been completed

Limitations: Annual Allocation 3,285 MG

Monitoring Wells:

Active Water-level Monitor Wells: 13

Water Quality Monitoring Program Wells: 46, of which 14 appear to be actively monitored.

Alternative Water Sources:

Floridan Aquifer System: Permitted capacity is 410.9 MGM, but only 2 wells (capacity ~ 64 MGM) are currently constructed. Reverse osmosis facilities to treat that water will be operational in the summer of 2008.

Utility Contingency Plan:

The utility currently rotates their pumping to limit withdrawals from their easternmost wells. The emergency contingency plan is to shut down that half of the wellfield and reduce pressure to their system. They do not have fixed triggers for when they might implement that plan, but do carefully track the water quality from their monitoring program. The possibility of mixing water from their two existing Floridan Aquifer wells was discussed, but the utility feels the salinity of the Floridan Aquifer water is too great to be practical.

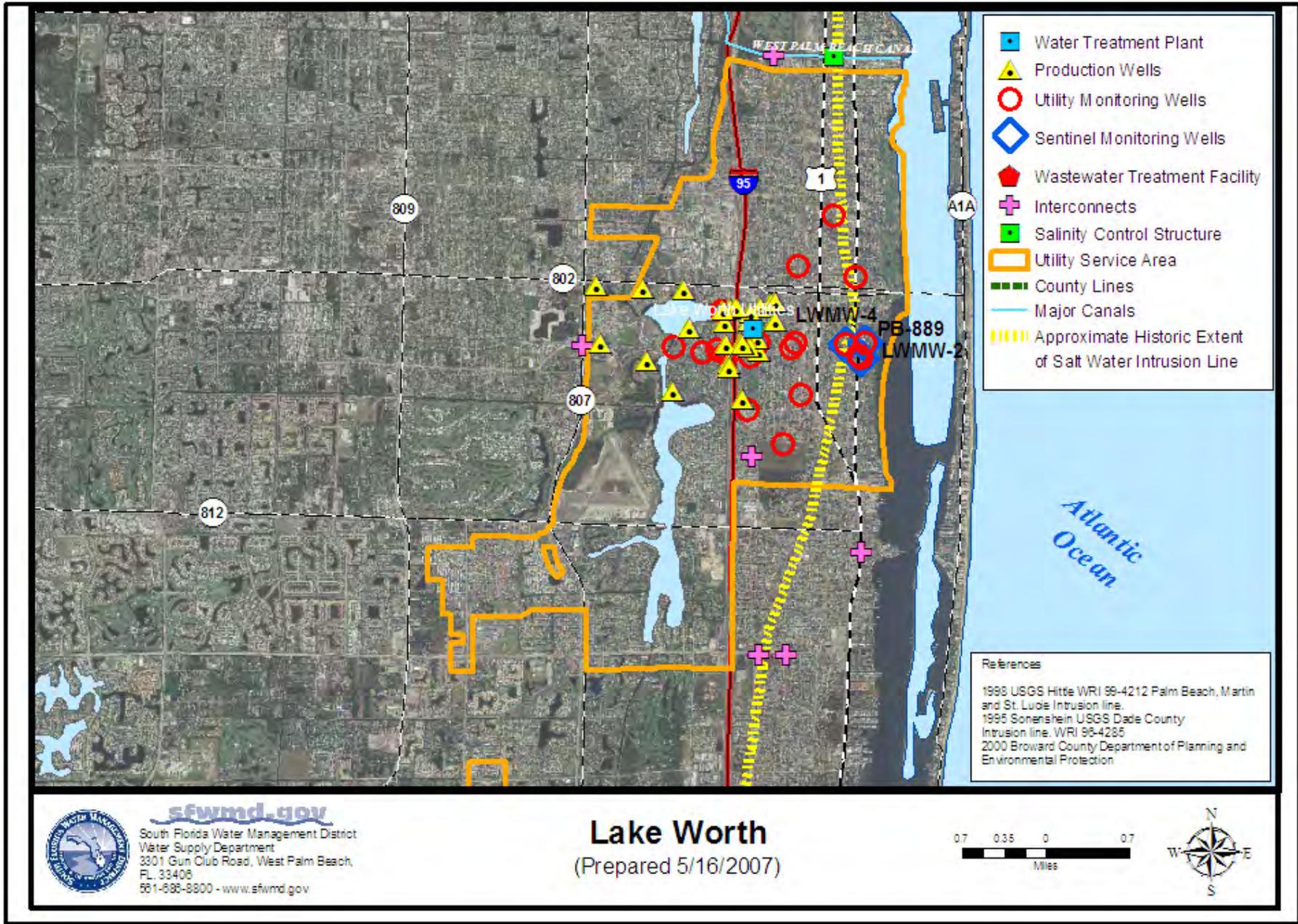
Interconnects & Supply Agreements with other Utilities:

City of West Palm Beach (1) 16" line

Palm Beach County (1) 8" line

Lantana (2) 6" lines

The utility does not have any existing supply agreements, but contingent on SFWMD approval, are exploring the possibility of providing up to 1 MGD to the City of West Palm Beach to help support water needs during the water shortage.



LANTANA

Utility Contact: Jerry Darr, Director (561) 540-5758

SFWMD Coordinator: Emily Richardson (561) 682-6824 ehopkins@sfwmd.gov

SFWMD Permit Reviewer: Kevin Rohrer (561) 682-6812 krrohrer@sfwmd.gov

Water Use Permit #: 50-00575-W Issued: 06/2005 Expired: 03/2006 (Application in-house)

Annual Allocation: 927 MG (2.54 MGD)

Max. Month. Allocation: 82.8 MG

2005 Pumpage: 2.20 MGD (803 MGY)

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 3.84 MGD

Treatment Method: Anion/ion exchange

Supply Sources:

Wellfields: 1

Biscayne:

Total Wells: 8 (7 currently operational). The western-most well (10) is awaiting health department approval.

Limitations: Due to concerns with saltwater intrusion, the city was required to submit a feasibility report. The LEC Water Supply Plan recommended the city develop an alternative water supply project.

Monitoring Wells:

Active Water-level Monitor Wells: 5

Water Quality Monitoring Program Wells: 13, of which 12 appear to be active.

Alternative Water Sources:

The city currently has neither an alternative water source, nor a fixed plan for developing one. Several proposals have been considered, such as development of a western Biscayne Wellfield to mitigate the potential for saltwater intrusion, or reducing Biscayne demand through a purchase agreement with another utility. For purchase agreements, the Town of Lantana would consider Boynton Beach or the county as options, but it is uncertain how much Boynton could provide with the current connection. The utility has no connection to the county, and would have to finance running a main from Military Trail to I-95 in order to have one, which may not be feasible as the Town of Lantana is still paying for the new water treatment plant.

Utility Contingency Plan:

There is no formal contingency plan. All of the Town of Lantana's wellfields are east of I-95, but Wells 7-10 are considerably farther west than the others. The contingency plan is to rely more heavily on the western wells and limit the eastern wells to just 20% of demand. Currently, the eastern wells provide about 40% of demand. When Well 10 comes on-line, the utility believes they will be able to shift another 10-15% to the west.

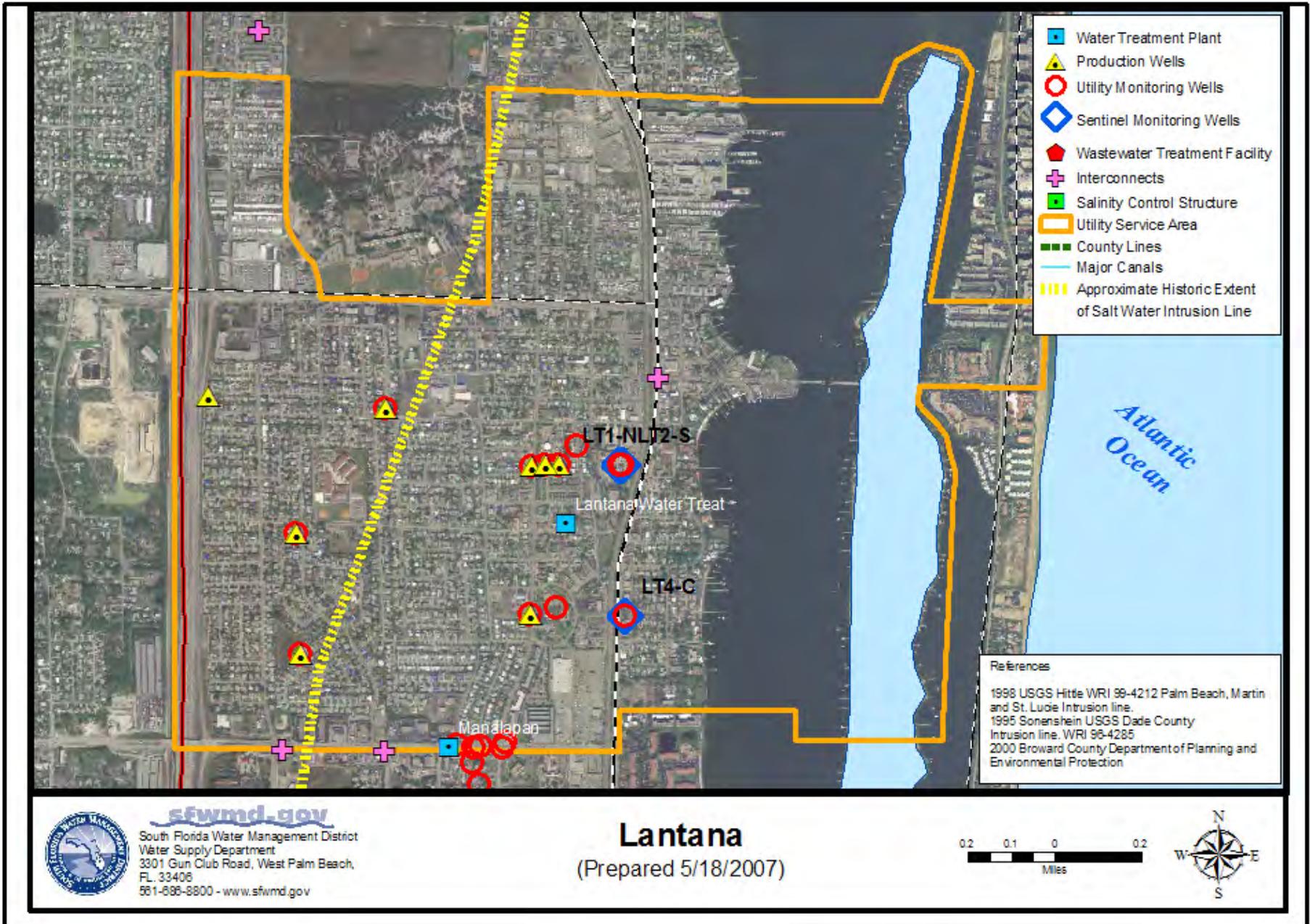
Interconnects & Supply Agreements with other Utilities:

City of Manalapan (1) 4" & (2) 6" lines

City of Lake Worth (2) 6" lines

City of Boynton Beach (2) 8" lines

The interconnects were put in for emergency purposes, and the one to Boynton Beach has never been tested. The utility stated that the other connections were not helpful to them because the 6" lines were not sufficient to support Lantana's system.



HILLSBORO BEACH

Utility Contact: Mike George (954) 941-605-3223 hillsborobeach@bellsouth.net

SFWMD Coordinator: Murray Miller (561) 682-6789 mmiller@sfwmd.gov

SFWMD Permit Reviewer: Jeff Scott (561) 682-6924 jscott@sfwmd.gov

Water Use Permit #: 06-00101-W Issued: 10/14/1993 Expired: 10/14/1998 (Application in-house)

Source: Biscayne Aquifer

Annual Allocation: 360 MG (0.99 MGD)

Max. Daily Allocation: 1.53 MGD

2005 Pumpage: 0.95 MGD

2006 Pumpage: 1.06 MGD

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 2 MGD

Treatment Method: Lime softening

Supply Sources:

Wellfields - 1

Total Wells: 3 - Primaries are #1, 3 and 4; and #2 is abandoned.

Monitoring Wells:

Water Quality Monitoring Program Wells: 2 - HBBSW1 and HBBMP1; head level dropped to zero in 1989 drought, but salinity did not change appreciably.

Alternative Water Sources:

None

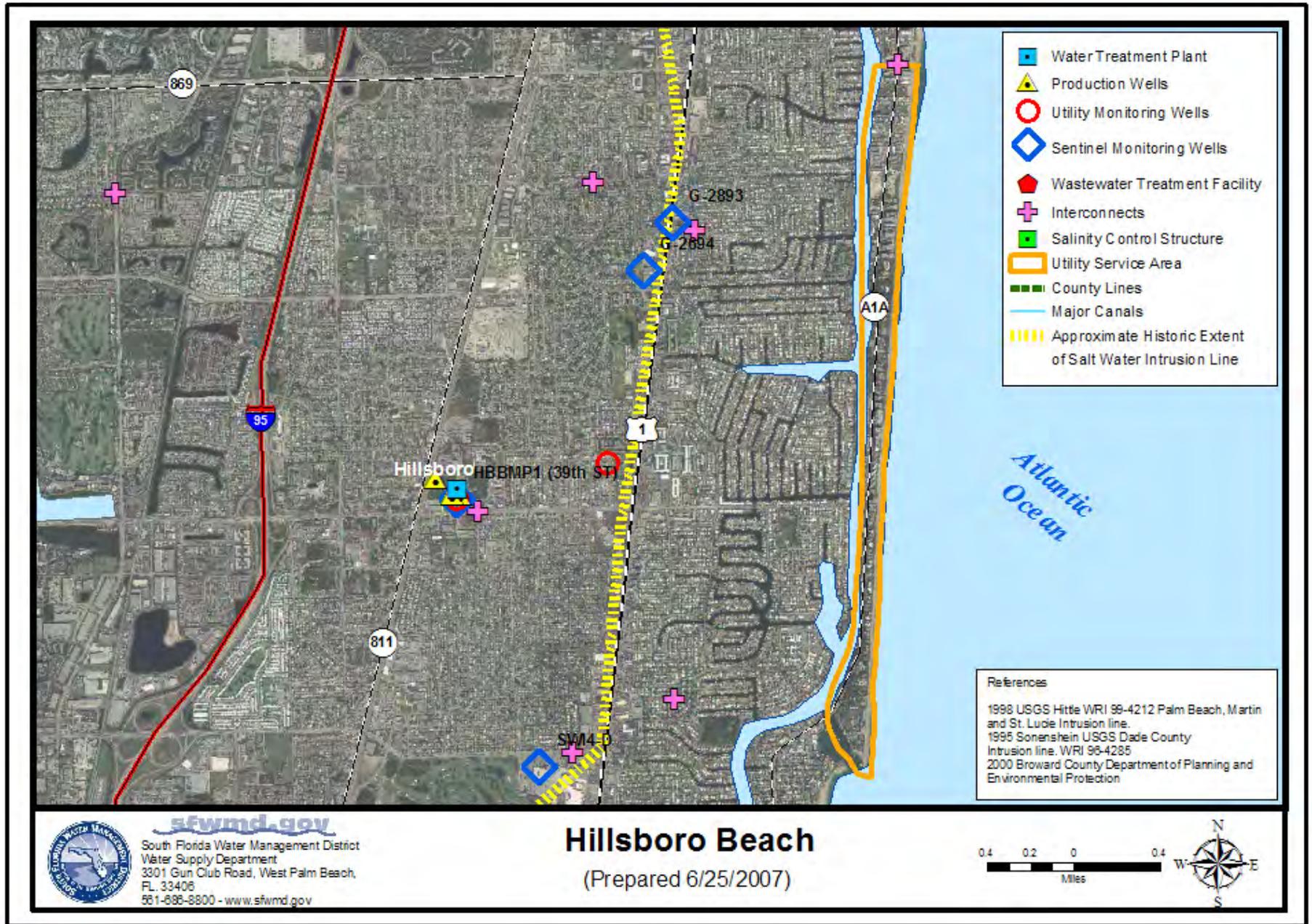
Utility Contingency Plan:

At this time, Hillsboro Beach will rely on emergency interconnects with Deerfield Beach and Broward County. The construction of a Floridan Aquifer well and reverse osmosis treatment system is under consideration and may be the basis for a permit application.

Interconnects & Supply Agreements With Other Utilities:

Deerfield Beach; 1 MGD, at A1A

Broward County District 2A; 1.12 MGD, at water plant



DANIA BEACH

Utility Contact: Dominic Orlando, Director (954) 924-3741; dorlando@ci.dania-beach.fl.us
Frederick Bloetscher, Consultant; (954) 925-3492; h2o_man@bellsouth.net

SFWMD Coordinator: Murray Miller (561) 682-6789 mmiller@sfwmd.gov

SFWMD Permit Reviewer: Kevin Rohrer (561) 682-6812 krohrer@sfwmd.gov

Water Use Permit #: 06-00187-W **Issued:** 3/15/2001 **Expired:** 3/15/2006 (Application in-house)

Source: Biscayne Aquifer

Annual Allocation: 730 MG (2 MGD)

Max. Daily Allocation: 2 MGD

2005 Pumpage: 1.33 MGD

2006 Pumpage: 1.70 MGD (50.2 MGM)

* 1.21 MGD purchased from Broward South Regional Wellfield (2005)

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 3 MGD

Treatment Method: Aeration, coagulation

Supply Sources:

Wellfields - 1

Total Wells: 2 - "G" (main, 1400 GPM peak, 1100 GPM average), "H" (backup@2hrs./mo.); a new well is expected to be online within 12 months due to lack of borehole on "H."

Limitations: During declared water shortage, reduce withdrawals to 1.5 MGD (LC#24). Further reduction may be required. Notify District within 5 days if chlorides >150 mg/L in production or monitoring wells.

Monitoring Wells:

Water Quality Monitoring Program Wells: Chlorides are measured at Salt Well G and Well "Emerald Hills," as well as the production wells. Chlorides currently <100 mg/L at production wells.

Alternative Water Sources:

None

Utility Contingency Plan:

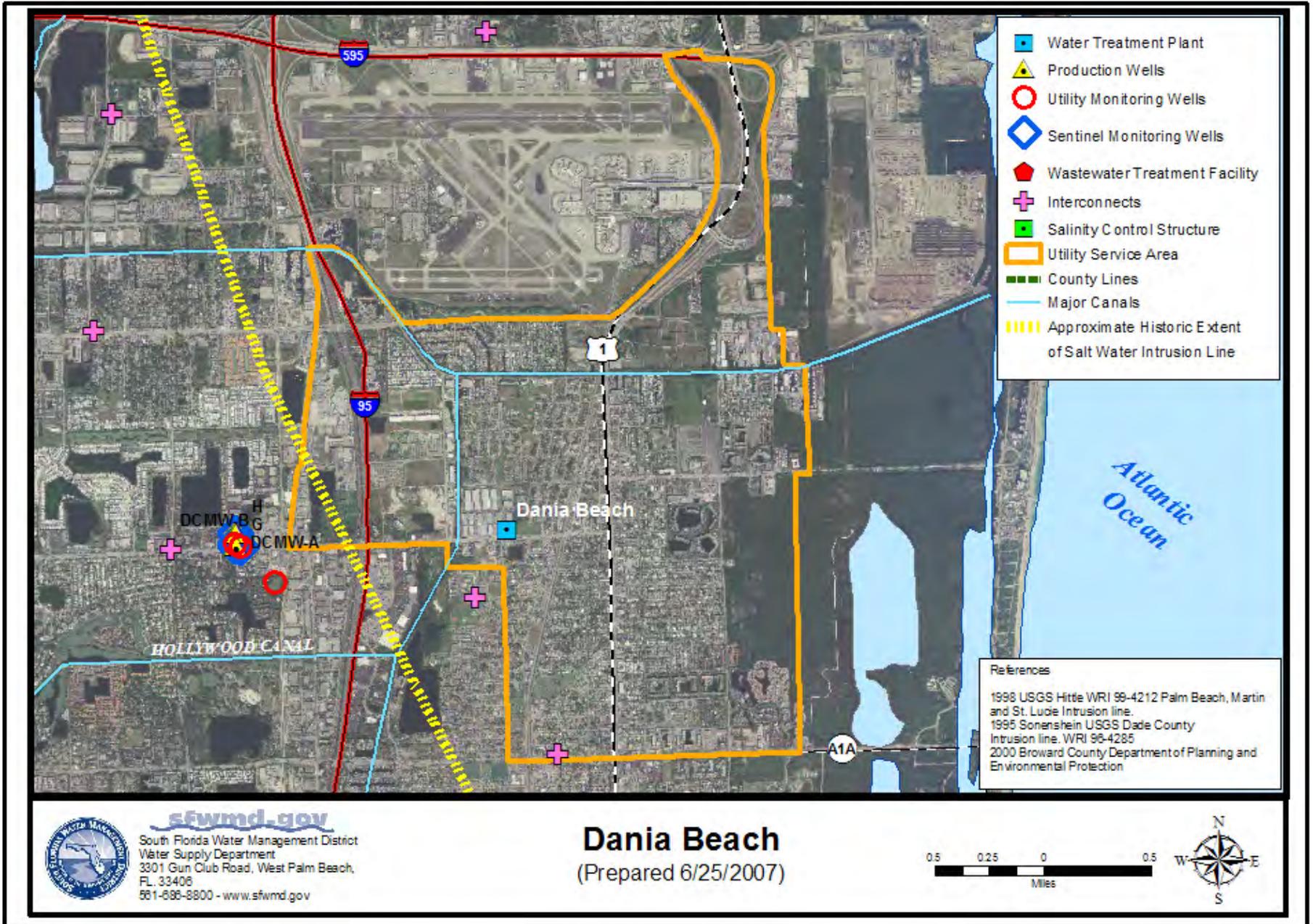
Dania Beach will exercise the following options before exceeding the recent 500 mg/L chloride standard: 1) Pressure will be reduced from 50 psi (plant)/45 psi (extremity) to 30 psi (extremity); 2) Dania Beach will rely on its emergency interconnect with Hollywood. The agreement is structured to provide unlimited quantity; 3) Incrementally increase blending of Brian Piccolo wellfield (raw). This source has capacity if permitted temporarily at designed capacity. However, color and THM will be a limiting factor on how much can be blended.

Discussion:

(Dominic Orlando, 4/19/07) Dania is currently pulling 1-1.8 MGD from wellfield and +1 MGD from Broward's Southern Regional wellfield. An emergency connection with Hollywood is used occasionally, quantities are variable.

Interconnects & Supply Agreements With Other Utilities: (Mapped, Exhibit 8)

Broward County: Broward 3A and South Regional (raw)(no pipe size info available); City of Hollywood (2) 8"; Ft. Lauderdale (1) 12" (agreement terminated).



HALLANDALE BEACH

Utility Contact: Earl King, Assistant: (954) 457-1669 eking@hallandalebeachfl.gov

SFWMD Coordinator: Murray Miller (561) 682-6789 mmiller@sfwmd.gov

SFWMD Permit Reviewer: Kevin Rohrer (561) 682-6812 krohrer@sfwmd.gov

Water Use Permit #: 06-00138-W Issued: 6/14/2001 Expired: 6/14/2006 (Application in-house)

Source: Biscayne Aquifer

Annual Allocation: 4.0 MGD (3.5 MGD from west wellfield + 0.5 from east wellfield)

Max. Daily Allocation: 3.5 MGD (west wellfield only)

2005 Pumpage: 3.25 MGD

2006 Pumpage: 3.73 MGD (113.39 MGM; 1369 MGY)

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 10 MGD for existing wells

Treatment Method: Lime softening for existing wells, with 1:1 blending of raw water from the county's Brian Piccolo wellfield; a 6 MGD membrane softening for treating unlimited raw water from Broward Regional is projected to be complete in December 2007.

Supply Sources:

Wellfields: 2 - Eastern and Western wellfields

Eastern Wellfield:

Total Wells: 1-6; Wells #3, 5 placed on standby after 1989 drought.

Limitations: Production had been limited to emergency use with prior District approval. Due to N. Miami Beach's limitations on water availability, a consent decree in 2005 authorized activation of this wellfield for an additional 0.5 MGD until 1/2008. Pumping must cease when chlorides reach 1,000 mg/L in Monitoring Well G-2965.

Western Wellfield:

Total Wells: 2; Well #8 - primary production, Well #7 - supplement

Limitations: Limiting Condition #23: In declared water shortage, production limited to 3 MGD (west wellfield only). Further reductions may be required by District.

Monitoring Wells:

Water Quality Monitoring Program Wells: G-2477 (production zone), G-2478 (base of aquifer) are 1,000' east of Well #7. Chlorides in the base of the aquifer have increased above 75 mg/L since the 1980s. LC #23: If chlorides >150mg/L in Wells #7 or #8, or, monitoring wells indicate instability, pumpage must be reduced and District notified. An additional monitoring well (G-2965) was installed as a result of the 2005 consent decree. G-2965 is 165', 30' from production well (replaces G-1473).

Alternative Water Sources:

None

Utility Contingency Plan:

Hallandale expects to incrementally blend additional raw water from the Brian Piccolo wellfield, as necessary. This source has design capacity but may need temporary permit. Hallandale may explore need to treat color with chlorine dosing and THM with chloramine.

HALLANDALE BEACH (Continued)

Discussion:

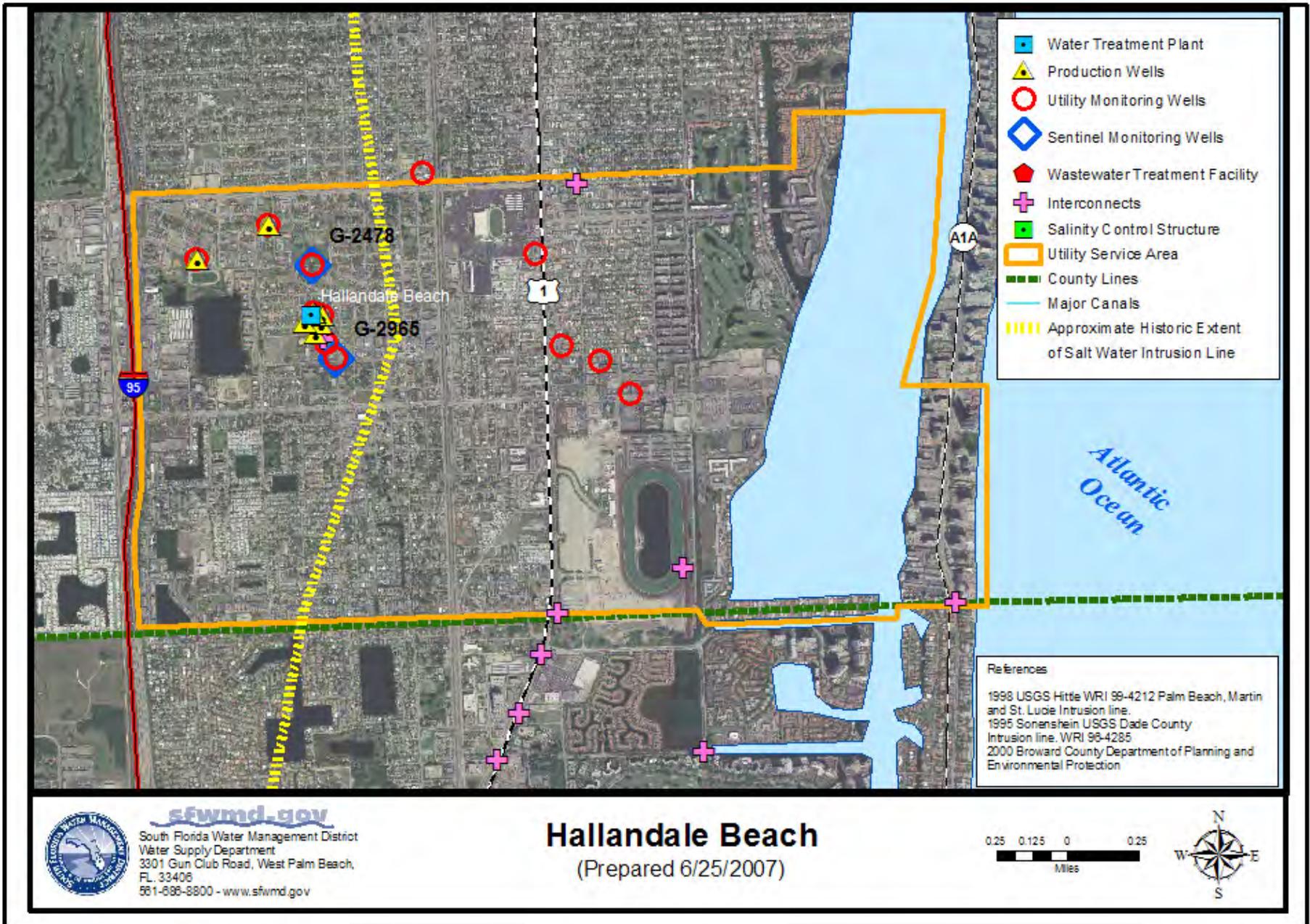
(Earl King, 4/19/07) Current usage is over 6 MGD. Pumpage from both wellfields increased 0.5 MGD to 4.0 MGD as per recent consent order, the balance (+2 MGD) is coming from Broward Piccolo (raw) and blended into the existing treatment train. Hallandale's wellfield pumpage will be reduced to 3.5 MGD when their membrane softening plant (to treat Broward Piccolo raw water) comes online in December (projected). No noted increase in chlorides to date.

The upper limit of Hallandale's agreement with Broward (Piccolo) is currently 6.2 MGD. Broward anticipated raising this limit to 7.2 MGD if and when the county is successful in getting their CUP. An agreement with N. Miami Beach exists for emergency use of 3 MGD.

An ordinance to permanently limit landscape irrigation to Phase 1 is in final reading. A reuse project is being contemplated as an offset to augment Broward's permit application in support of the agreement with Hallandale. Mr. King requested copies of the Broward and Hollywood utility profiles when they are mailed.

Interconnects & Supply Agreements With Other Utilities:

Broward County (South Regional Wellfield) for 10.5 MGD capacity via 24" and N. Miami Beach for 3 MGD via 20".



SOUTH MIAMI-DADE

Utility Contact: Ralph Terrero (786) 552-8112 work (786) 229-0702 cell TERRERO@miamidade.gov

SFWMD Coordinator: Karin Smith (561) 682-2026 karsmith@sfwmd.gov

SFWMD Permit Reviewer: Karin Smith (561) 682-2026 karsmith@sfwmd.gov

Water Use Permit #: 13-00040-W Issued: 3/2003 Expires: 3/2008*

Source: Biscayne Aquifer

Annual Allocation: 3,997 MG (11 MGD)

Max. Month. Allocation: 13.4 MGD Max Day

2005 Pumpage: 7 MGD

2006 Pumpage: 7 MGD

* This permit is being combined with two other permits and the combined allocation is limited to 349.76 MGD per an interim water use agreement.

Treatment Facilities:

Number of Facilities: 5

Total Capacity: 12.03 MGD

Treatment Method: Chlorination

Supply Sources:

Wellfields: 5 - Leisure City, Newton, Elevated Tank, Everglades Labor, Naranja

Leisure City Wellfield:

Total Wells: 4 (5.76 MGD max capacity)

Limitations: None, 2½ miles to saltwater intrusion line

Newton Wellfield:

Total Wells: 1 active (2.16 MGD capacity) + 1 inactive (2.16 MGD)

Limitations: None, 2½ miles to saltwater intrusion line

Elevated Tank Wellfield:

Total Wells: 2 (4.6 MGD capacity)

Limitations: None, 1½ miles to saltwater intrusion line

Everglades Labor Camp Wellfield:

Total Wells: 2 active (2.88 MGD capacity) + 1 inactive (0.72 MGD)

Limitations: None

Naranja Well:

Total Wells: 1 (1.15 MGD capacity)

Limitations: None, 2 miles to saltwater intrusion line

Monitoring Wells:

Water Quality Monitoring Program Wells: 7

G-3701, G-3162, G-1180 (sentry well), G-1179, G-3235A, G3698, G-3699

Alternative Water Sources:

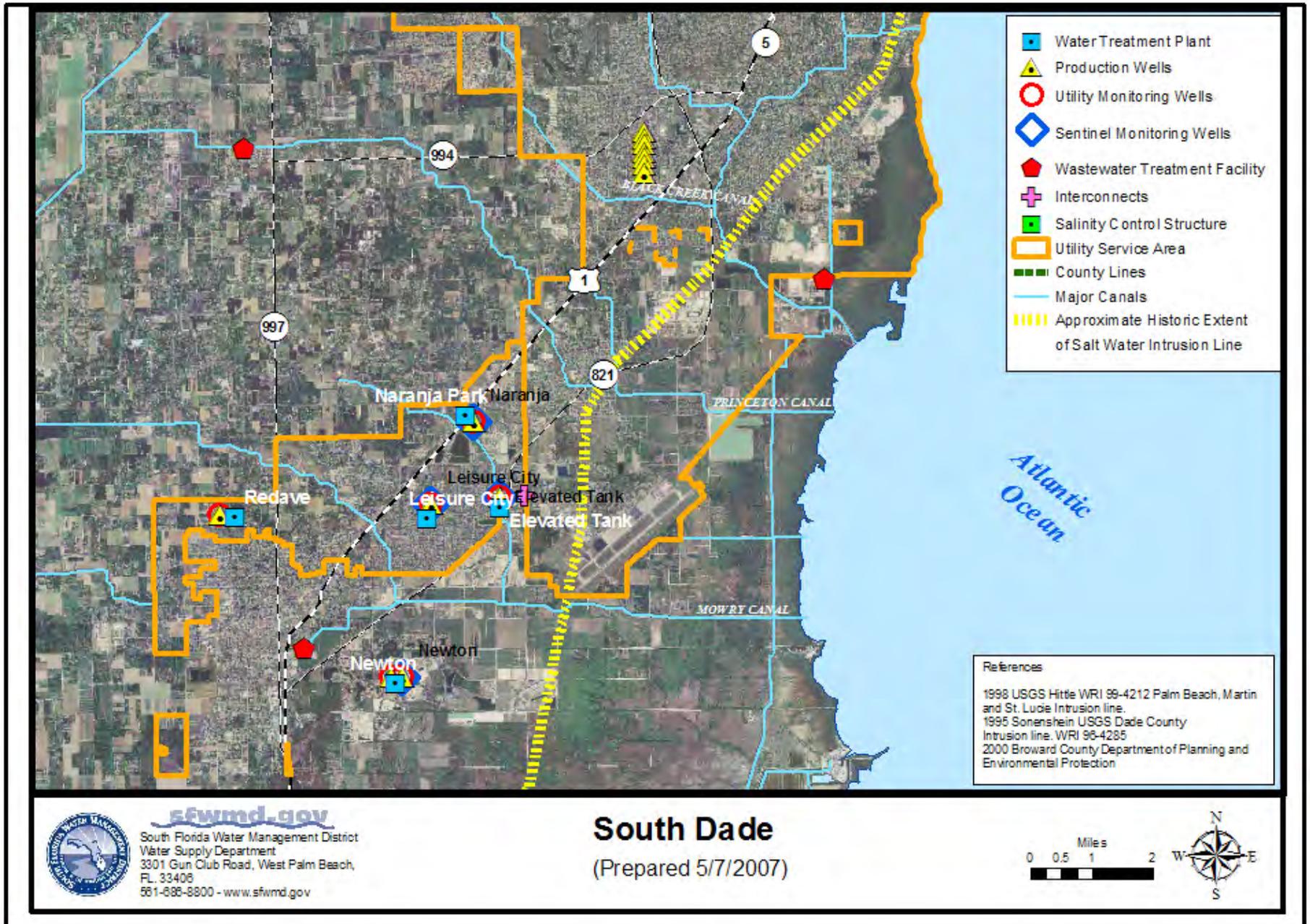
None

Utility Contingency Plan:

Weekly chloride samples and water levels are taken at the 5 wellfields and at well G-1180. No contingency plan.

Interconnects & Supply Agreements With Other Utilities:

Five South Dade WTP's and Alexander Orr WTP are interconnected with 48" pipe.



FLORIDA CITY

Utility Contact: Peter Baljet, P.E., City Engineer (305) 670-3986 baljet7pdg@aol.com

SFWMD Coordinator: Steve Bell (561) 682-6935 sbell@sfwmd.gov

SFWMD Permit Reviewer: Steve Bell (561) 682-6935 sbell@sfwmd.gov

Water Use Permit #: 13-00029-W Issued: 03/14/1996 Expired: 03/14/2006 (Application in-house)

Source: Biscayne Aquifer

Annual Allocation: 890 MG (2.44 MGD)

Max. Daily Allocation: 3.51 MGD

2005 Pumpage: 2.50 MGD

* These allocations are subject to change (reduction) based on historical use and revised population projections. Florida City is currently undergoing replacement of the distribution system due to unaccounted for losses as high as 60%.

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 4.00 MGD

Treatment Method: 4.00 MGD Disinfection (chlorine)

Supply Sources:

Wellfields: 1

Total Wells: 4

Limitations: None

Monitoring Wells:

Water Quality Monitoring Program Wells: Chloride concentration is measured monthly in each production well. Due to the proximity to the Florida Keys Aqueduct Authority (FKAA) wellfield, the SALT monitoring program for FKAA is used for both utilities.

Alternative Water Sources:

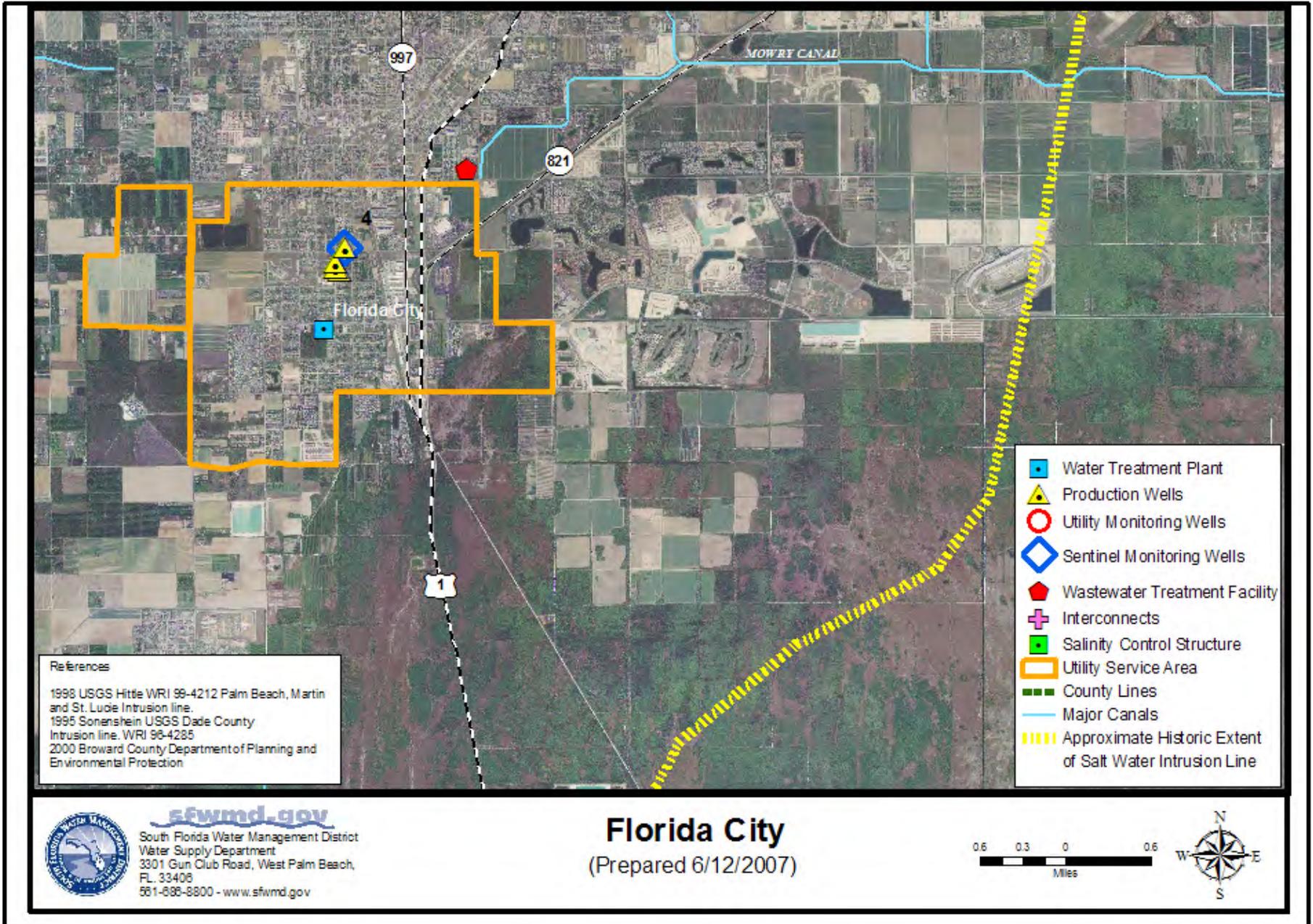
None

Utility Contingency Plan:

The utility will comply with the requirements of the Water Shortage Plan (Chapter 40E-21, Part V, Specific Restrictions, Florida Administrative Code) and reduce system pressure to 45 pounds per square inch.

Interconnects & Supply Agreements with Other Utilities:

There is one interconnection with the City of Homestead at Lucy Street and NW 6th Avenue.



HOMESTEAD

Utility Contact: Steve Anderson (786) 367-5501 sanderson@cityofhomestead.com

SFWMD Coordinator: Steve Bell (561) 682-6935 sbell@sfwmd.gov

SFWMD Permit Reviewer: Steve Bell (561) 682-6935 sbell@sfwmd.gov

Water Use Permit #: 13-00046-W Issued: 5/10/2006 Expires: 5/10/2026

Source: Biscayne Aquifer

Annual Allocation: 4,886 MG (13.39 MGD)

Max. Month. Allocation: 463.90 MG

2005 Pumpage: 10.70 MGD

* These allocations are authorized through 5/11/2011. After 5/11/2011, the annual allocation shall not exceed 3,635 MG and the maximum monthly shall not exceed 345 MG.

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 14.50 MGD

Treatment Method: Disinfection (chlorine gas)

Supply Sources:

Wellfields: 2 - Harris Field, Wittkop Park

Harris Field Wellfield:

Total Wells: 2

Limitations: None

Wittkop Park Wellfield:

Total Wells: 4

Limitations: None

Monitoring Wells:

Water Quality Monitoring Program Wells: 2 (MW 60 and MW95)

Alternative Water Sources:

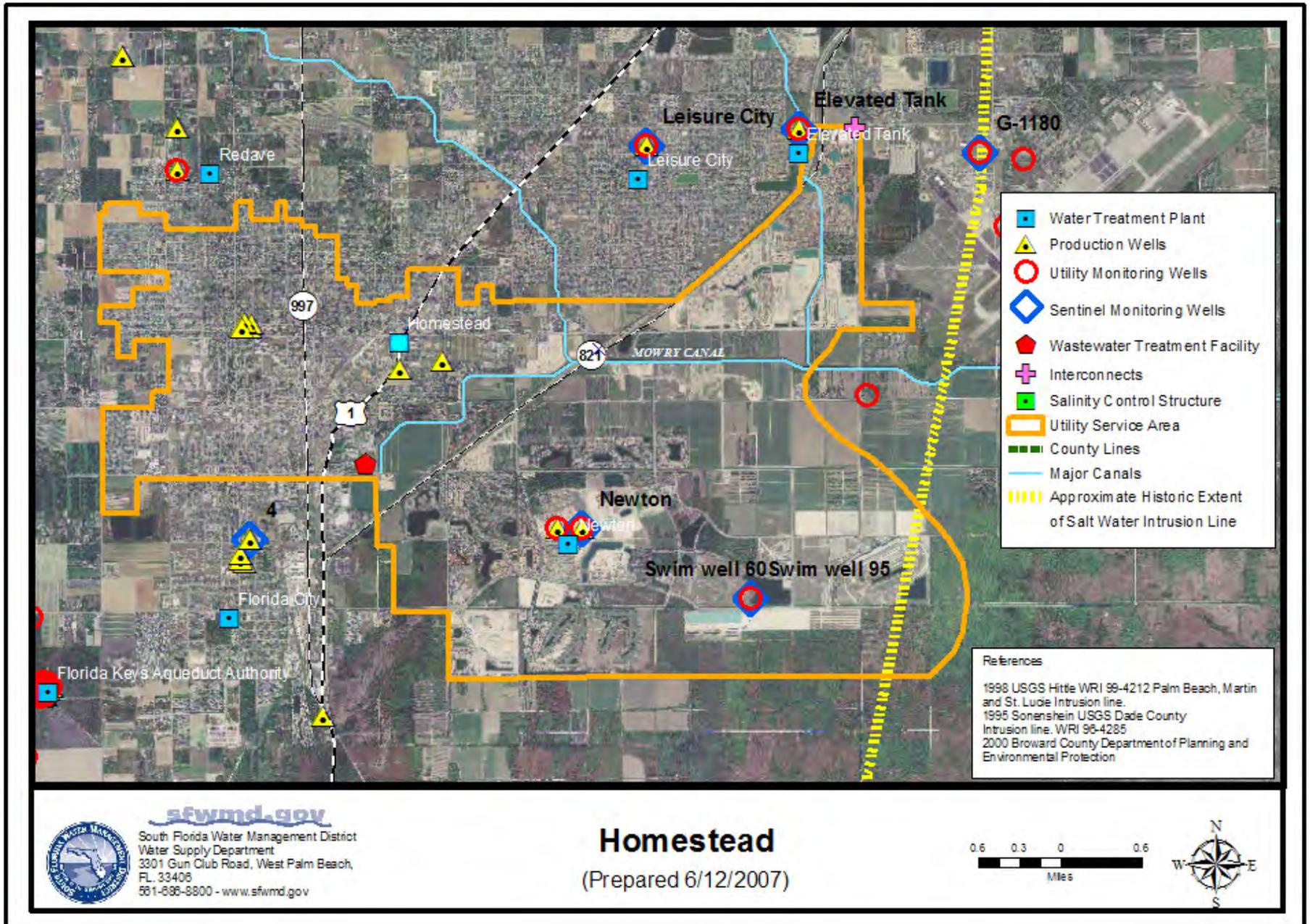
Reclaimed Water: The utility is currently permitted to recharge the Biscayne Aquifer with up to 6 MGD of reclaimed water introduced into rapid infiltration trenches at the water treatment plant.

Utility Contingency Plan:

The utility will comply with the requirements of the Water Shortage Plan (Chapter 40E-21, Part V, Specific Restrictions, Florida Administrative Code) and reduce system pressure to 45 pounds per square inch.

Interconnects & Supply Agreements with Other Utilities:

Miami-Dade- (1) 16"



FLORIDA KEYS AQUEDUCT AUTHORITY

Utility Contact: Jolynn Reynolds, P.E., Water Quality Engineer (305)-296-2454 joreynolds@fkaa.com

SFWMD Coordinator: Steve Bell (561) 682-6935 sbell@sfwmd.gov

SFWMD Permit Reviewer: Steve Bell (561) 682-6935 sbell@sfwmd.gov

Water Use Permit #: 13-00005-W Issued: 9/14/2005 Expires: 6/8/2025

Source: Biscayne Aquifer/Floridan Aquifer/Seawater

Annual Allocation: 7,274 MG (19.93 MGD)

Max. Month. Allocation: 723.21 MG

2005 Pumpage: 17.78 MGD (currently 13.92 MGD)

* These allocations are authorized through 10/10/2007. After 10/10/2007, the annual allocation shall not exceed 6,442 MG and the maximum monthly shall not exceed 617 MG.

Treatment Facilities:

Number of Facilities: 3 (Florida City, Marathon, Stock Island)

Total Capacity: 26.80 MGD

Treatment Method: 23.80 MGD lime softening (4 percent blending from Floridan Aquifer)
3.00 MGD reverse osmosis (seawater - Marathon, Stock Island)

Supply Sources:

Wellfields: 1

Total Wells: 11 (10 Biscayne Aquifer, 1 Floridan Aquifer blending well)
One proposed Floridan aquifer storage and recovery (ASR) well under construction

Limitations: Average Day allocation from the Biscayne Aquifer limited to 17 MGD from 12/1 through 4/1 when ASR well becomes operational

Reverse Osmosis:

Total Facilities: 2 (Marathon, Stock Island)

Limitations: None (seawater)

Monitoring Wells:

Water Quality Monitoring Program Wells: 13 SALT program wells

Alternative Water Sources:

Seawater - 3 MGD total capacity on Marathon and Stock Island

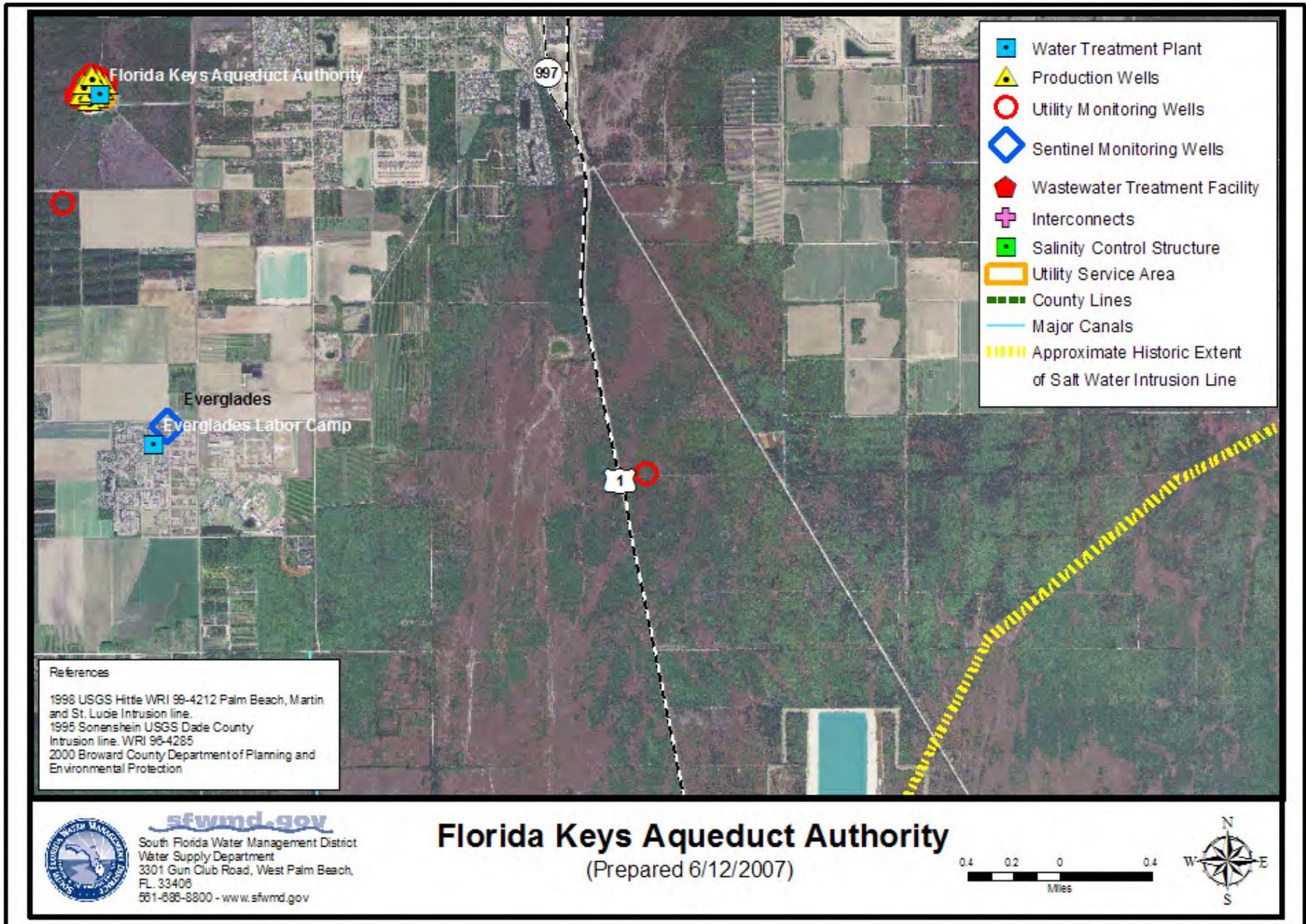
Reclaimed Water - The utility operates a 40,000 gallon per day facility serving Duck Key/Hawk's Cay.

Utility Contingency Plan:

The utility would further reduce pressure in the delivery system. The reverse osmosis facilities (seawater) on Marathon and Stock Island would be activated.

Interconnects & Supply Agreements With Other Utilities:

There are no interconnects with other utilities. Bulk sale contract to supply U.S. Navy with up to 2.40 MGD.



COASTAL UTILITIES OF CONCERN: UTILITY SUMMARIES AND WELLFIELD MAPS

TEQUESTA

Utility Contact: Roy Fallon (561) 262-4344 Roys67@aol.com

SFWMD Coordinator: Barbara Powell (561) 682-2236 bpowell@sfwmd.gov

SFWMD Permit Reviewer: Paulette Glebocki (561) 682-6941 pglebock@sfwmd.gov

Water Use Permit #: 50-00046-W Issued: 2/1996 Expired: 2/2006 (Application in-house)

Sources: Surficial Aquifer and Floridan Aquifer

Annual Allocation: 1,768 MG (4.84 MGD)

Max. Daily Allocation: 2.70 MG

2005 Pumpage: 2.34 MGD

Treatment Facilities:

Number of Facilities: 2

2.73 MGD capacity sand filtration

1.20 MGD reverse osmosis (additional 1.20 MGD expansion to be completed Summer 2007)

Total Capacity: 3.93 MGD

Supply Sources:

Wellfields: 2 Eastern and Western Peninsula Wellfields

Eastern Wellfield:

Total Wells: 7 Surficial Aquifer, 2 Floridan Aquifer

Limitations: Maximum Daily 1.80 MGD from Surficial Aquifer

Western Wellfield:

Total Wells: 3 Surficial Aquifer

Limitations: Maximum Daily 0.90 MGD from wellfield

* Surficial Aquifer maximum daily allocation is 2.70 MGD

Tequesta has an agreement with Jupiter to purchase 1.35 MGD of water. This agreement expires in June 2007. Tequesta intends to replace this water with water produced from an expansion of the reverse osmosis plant expected to be completed at about the same time (6/2007). The interconnection will be kept for emergency purposes.

Monitoring Wells:

Water Quality Monitoring Program Wells: ~15 usable monitor wells

* Water levels and some conductivity measurements are taken monthly. Chlorides are measured quarterly. Weekly chlorides are taken at two monitor wells.

Alternative Water Sources:

Use of Floridan Aquifer System wells for supply. Loxahatchee River District treats up to 6.0 MGD of reclaimed water used to irrigate 13 golf courses.

Utility Contingency Plan:

The contingency plan is to shift withdrawals from the Eastern Peninsula Wellfield to the Western Wellfield. The expansion of the reverse osmosis water treatment facility will also allow more flexibility in using the Floridan Aquifer System instead of the Surficial Aquifer.

Interconnects & Supply Agreements With Other Utilities:

Town of Jupiter at Bridge Road and Old Dixie Highway

Southern Martin County Utilities at A1A at County Line (Blowing Rocks Preserve) - supplies 50 houses

Southeast Landing Development at S.E. Landing Place and Country Club Drive

JUPITER

Utility Contact: Paul Jurczak, Manager (561) 741-2602 paulj@jupiter.fl.us

SFWMD Coordinator: Barbara Powell (561) 682-2236 bpowell@sfwmd.gov

SFWMD Permit Reviewer: Steve Bell (561) 682-6935 sbell@sfwmd.gov

Water Use Permit #: 50-00010-W Issued: 11/11/2004 Expires: 11/14/2024

Source: Surficial Aquifer/Floridan Aquifer

Annual Allocation: To 10/14/2009: 9,172 MG (25.13 MGD)

Annual Allocation: To 11/14/2024: 8,314 MG (22.78 MGD)

Max. Month. Allocation: 935 MG

2005 Pumpage: 17.70 MGD

2006 Pumpage: 18.29 MGD [Surficial Aquifer (SAS): 10.42; Floridan Aquifer (FAS): 7.87]

Treatment Facilities:

Number of Facilities: 2

Total Capacity: 29.30 MGD

Treatment Method: 13.50 MGD lime softening; 13.70 MGD reverse osmosis; 1.80 MGD ion exchange

* The Nanofiltration Plant will begin to phase out all remaining conventional treatment processes used in Jupiter by late 2009. Contract was sent out for re-bids.

Supply Sources:

Wellfields: 4 - #1, #2 and #3, and Floridan Aquifer wellfield

Wellfield #1:

Total Wells: 5 - all wells abandoned

Wellfield #2:

Total Wells: 19 Need confirmation

Wellfield #3:

Total Wells: 24 (10) Need confirmation

Wellfield #4: Under construction

Total Wells: 0

Floridan Wellfield:

Total Wells: 12 (Reverse Osmosis #1 abandoned)

Limitations: Avg Annual: FAS: 4427 MG; SAS: 3887 MG; Max Mo.: FAS: 555 MG; SAS: 380 MG

Monitoring Wells:

Water Quality Monitoring Program Wells: 9 Chlorides/14 water levels only

Alternative Water Sources:

Use of Floridan Aquifer System wells for supply. Loxahatchee River Environmental Control District treats up to 6 MGD of reclaimed water used to irrigate 13 golf courses. Nano concentrate to be blended with reclaimed water system for irrigation purposes.

Utility Contingency Plan:

In the event of a District declared water shortage covering the Town of Jupiter service area, the permittee is authorized to increase the utilization of the Floridan Aquifer wells over the allocation included in Limiting Condition No. 5, unless otherwise directed in the applicable water shortage order.

Interconnects & Supply Agreements With Other Utilities:

Interconnect with Tequesta at: 1675 N. Old Dixie Highway.

Interconnect with Tequesta at: SE Country Club Drive South of Cove Point Street.

Interconnect With Seacoast at: North east side of Donald Ross and Alternate A1A.

All four interconnects are handled with valves. Interconnect with Seacoast at US-1/AIA in Juno Beach.

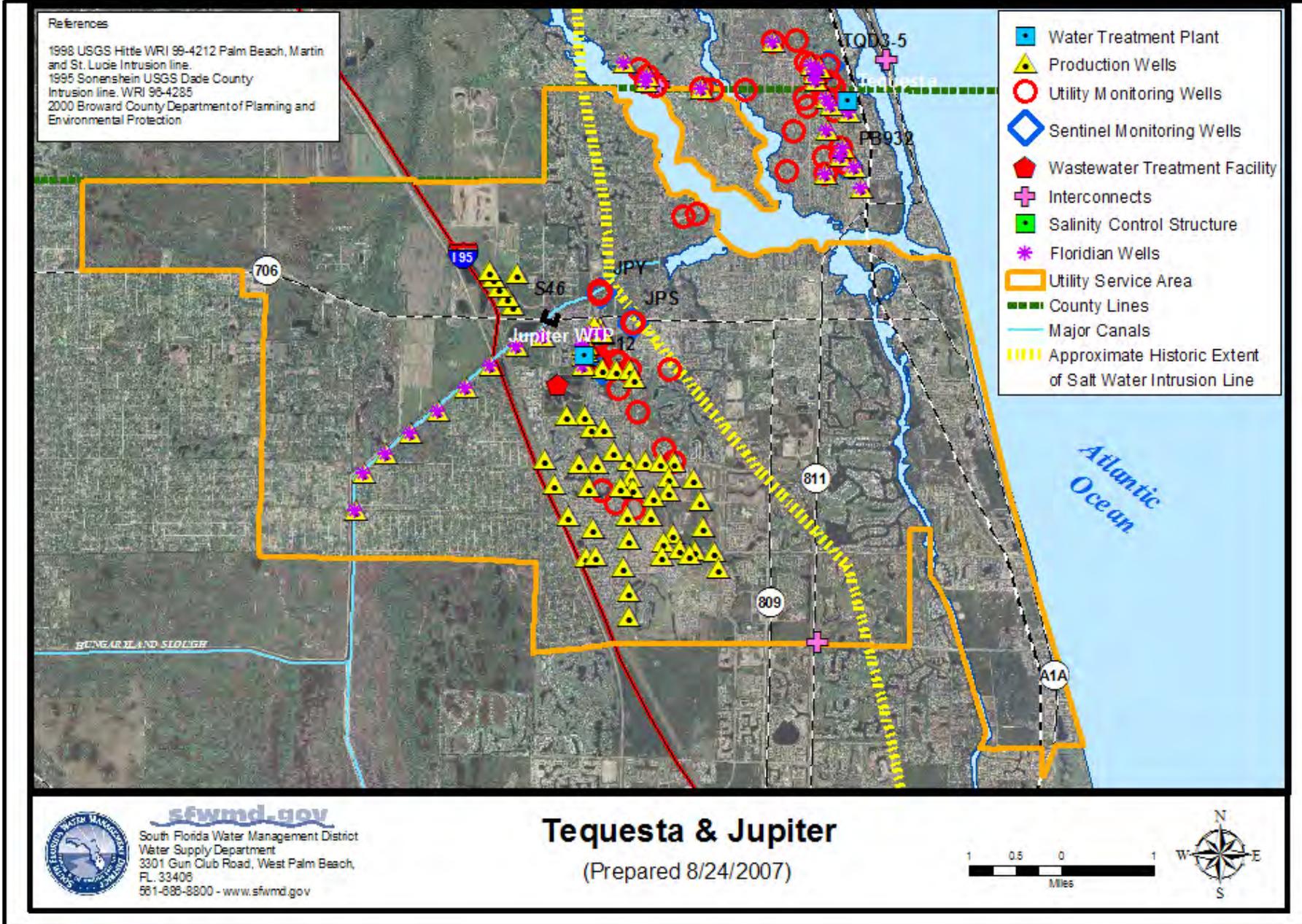
US-1/AIA Seacoast Interconnect 8" meter 16" DIP

Country Club Dr. Tequesta 6" meter 12" DIP

Old Dixie Hwy. Tequesta 6" meter 12" DIP

Seacoast Donald Ross/Alt. AIA 8" meter 16" DIP

The above information provided by Amanda Barnes (Assistant Director of Utilities-Jupiter) on 04/20/07.



RIVIERA BEACH

Utility Contact: David Danford (561) 845-4051 ddanford@rivierabch.com
SFWMD Coordinator: Davies Mtundu (561) 682-6581 dmtundu@sfwmd.gov
SFWMD Permit Reviewer: Steve Bell (561) 682-6935 sbell@sfwmd.gov

Water Use Permit #: 50-00460-W Issued: 08/08/1985 Expires: Application in-house (950724-10)

Source: Surficial Aquifer

Annual Allocation: 3,250 (8.90 MGD)
Max. Daily Allocation: 14.26 MG
2005 Pumpage: 7.42 MGD
2006 Pumpage: 7.88 MGD (estimated)

Treatment Facilities:

Number of Facilities: 1
Total Capacity: 17.50 MGD
Treatment Method: Lime softening

Supply Sources:

Wellfields: 2 Eastern and Western Wellfield

Eastern Wellfield

Total Wells: 16
Limitations: Withdrawals limited to 6 MGD

Western Wellfield

Total Wells: 11
Limitations: None

Monitoring Wells:

Water Quality Monitoring Program Wells: 2 (RB20 and RB32). RB20 is the sentinel well

Alternative Water Sources:

R/O Water Projects:

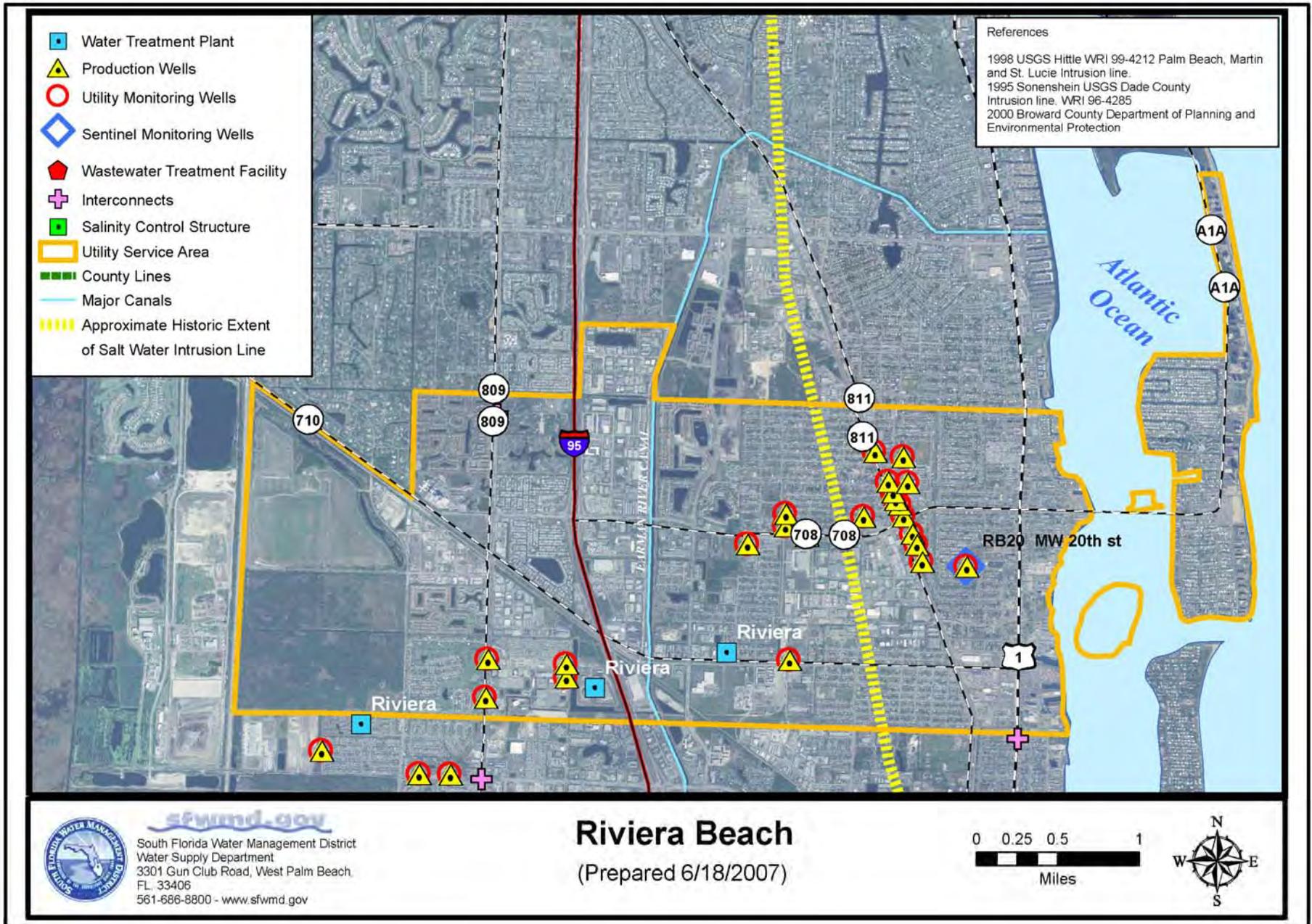
The City of Riviera Beach has indicated it will move completely to a Floridan Aquifer water source for its water supply by 2025. The District recommends accelerating the timeline of this project to meet future demands and given the city's current operating conditions.

Utility Contingency Plan:

The utility will move as much of the withdrawals from the eastern wellfield as possible to the western wellfield. The western wellfield has issues with the potential for impacts to wetlands and the potential for increased drawdown at the Palm Beach County Solid Waste Authority Resource Recovery Facility.

Interconnects & Supply Agreements with Other Utilities:

Seacoast Utility Authority - (1) 12" at Leo and Military Trail
West Palm Beach - (2) 12" at 59th Street and US-1 and the other at Military Trail and 45th Street



MANALAPAN

Utility Contact: Valerie May 561-714-08495 (cell) wplant@bellsouth.net

SFWMD Coordinator: Barbara Powell (561) 682-2236 Bpowell@sfwmd.gov

SFWMD Permit Reviewer: Karin Smith (561) 682-2026 karsmith@sfwmd.gov

Water Use Permit #: 50-00506-W **Issued:** 8/13/2003 **Expires:** 8/14/2023

Source: Biscayne Aquifer

Annual Allocation: 699.0 MG (1.91 MGD)

Max. Month. Allocation: 71.2 MGD

2006 Pumpage: 0.74 MGD [Surficial Aquifer (SAS): 0.67 MGD Floridan Aquifer (FAS)= 1.41 MGD]

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 1.9 MGD on-site storage capacity of 715,000 gallons. Floridan Aquifer treatment losses are expected to be about 25%.

Supply Sources:

Wellfields: 2 - SAS and FAS

SAS Wellfield:

Total Wells: 2 currently

Limitations:

FAS Wellfield:

Total Wells: 1 (W15)

Limitations: SAS is limited and expected to provide only 30% for blending with the rest coming from FAS.

Monitoring Wells:

Water Quality Monitoring Program Wells:

Peele/Dixie: 5 wells; **Prospect:** 5 wells

Sentinel Monitor Wells: MW2, MW6 monitored weekly for chlorides, conductance and water level.

Alternative Water Sources:

Future - FAS

Utility Contingency Plan:

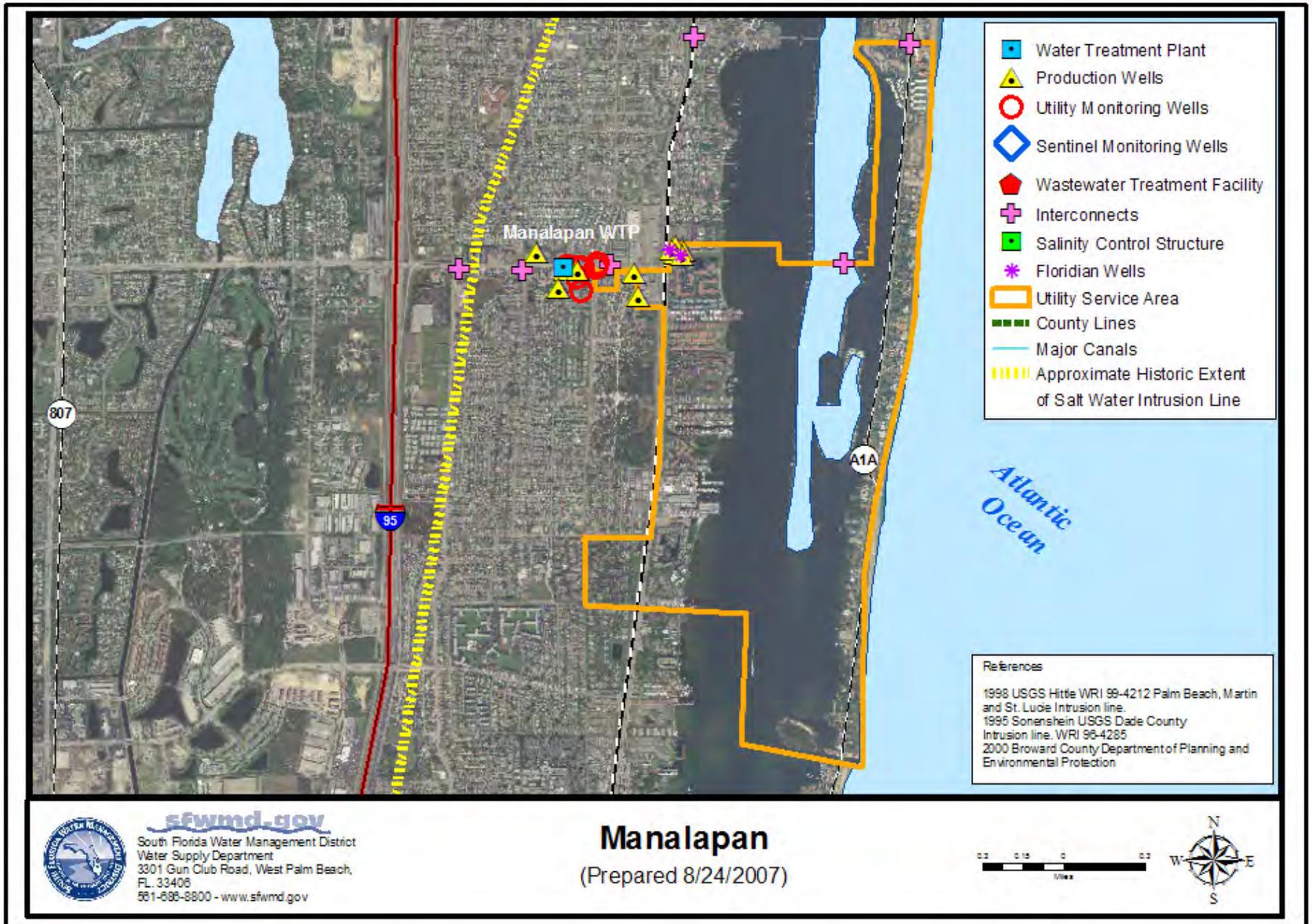
The contingency plan for a drought would be to lower the percentage of SAS water blended with reverse osmosis water to the lowest possible level. This could be accomplished by partially closing raw water main valves on a temporary basis. Long-term issues would involve installing variable frequency drives on the existing SAS wells. Non-drought situations would involve opening the interconnects with Lantana.

Interconnects & Supply Agreements With Other Utilities:

Hypoluxo Rd: 6" 0.50 MGD 26° 34' 19.83" N 80° 03' 24.92" W

E.Ocean Blvd. 8" 1.00 MGD 26° 35' 02.12" N 80° 02' 20.37" W

Point Manalapan 4" 0.25 MGD 26° 34' 19.80" N 80° 02' 34.86" W



BOYNTON BEACH

Utility Contact: Kofi Boateng, Director (561) 742-6401 boatengk@ci.boynton-beach.fl.us

SFWMD Coordinator: Laura Corry (561) 682-6012 lcorry@sfwmd.gov

SFWMD Permit Reviewer: Jeff Scott (561) 682-6924 jscott@sfwmd.gov

Water Use Permit #: 50-00499-W Expires: 8/14/2010

Source: Surficial Aquifer System/ Floridan Aquifer System

Annual Allocation: 7,844 MG (21.49 MGD)

Max. Month. Allocation: 741.1 MG

2005 Pumpage: 14.55 MGD

Treatment Facilities:

Number of Facilities: 2

Total Capacity: 34 MGD

Treatment Method: Lime softening 24.00 MGD; membrane softening 10 MGD; reverse osmosis 10.00 MGD (proposed)

Supply Sources:

Wellfields: 2 - Eastern and Western

Eastern Wellfield

Total Wells: 19

Limitations: 8 MGD

Western Wellfield

Total wells: 11

Limitations: 12

Monitoring Wells:

Water Quality Monitoring Program Wells: 14

Alternative Water Sources:

1. Floridian Reverse Osmosis: proposed to be completed for 2013
2. Aquifer Storage Recovery (ASR) 4 MGD and 2 MGD

Utility Contingency Plan:

Cut back on pumpage of eastern most wells. Maximize use of ASR. Specific trigger that would shift pumpage would be an emergency situation. Being more flexible with regulatory limits during this water shortage would assist.

Interconnects & Supply Agreements With Other Utilities:

Palm Beach County Water Utilities: (2) 12" emergency and amending sales agreement for 1 MGD until 2013

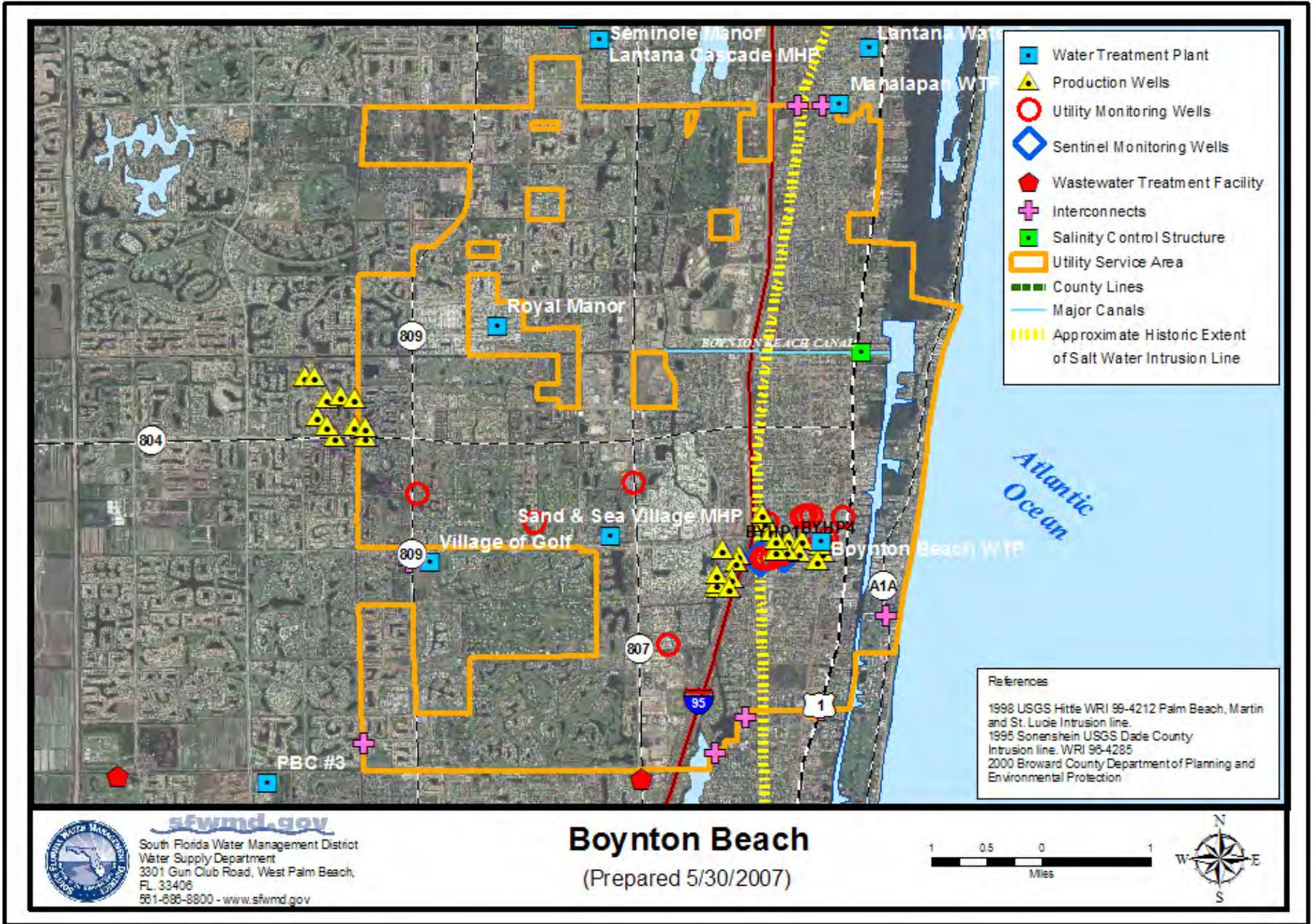
City of Delray Beach Utilities: (2) 6" emergency

Town of Gulfstream: (1) 6" emergency

Town of Lantana: (2) emergency

Village of Golf: (1) emergency

In addition, the City of Boynton Beach is also exploring the opportunity of a 12-inch interconnection with the City of Lake Worth on Hypoluxo Road.



DELRAY BEACH

Utility Contact: Richard Hasko (561) 243-7336 hasko@ci.delray-beach.fl.us
SFWMD Coordinator: Laura Corry (561) 682-6012 lcorry@sfwmd.gov
SFWMD Permit Reviewer: Steve Memberg (561) 682-2133 smemberg@sfwmd.gov

Water Use Permit #: 50-00177-W Issued: 3/9/2005 Expires: 3/9/2025

Source: Surficial Aquifer/Floridan Aquifer

Annual Allocation: From 3/10/2005 to 3/9/2025 - 6,937 MG (19.01 MGD)

Annual Allocation: From 3/11/2010 to 3/9/2025 - 5,811 MG (15.92 MGD)

Max. Month. Allocation: 670.8 MG

2005 Pumpage: 17.30 MGD

2006 Pumpage: 21.50 MGD

* Aquifer storage and recovery (ASR) well not currently in use.

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 26 MGD

Treatment Method: Lime softening

Supply Sources:

Wellfields: 2 - Eastern and Western

Eastern Wellfield

Total Wells: 12

The withdrawals from the Eastern wellfield shall not exceed 5.8 MGD and shall be further restricted as follows:

Withdrawals from Wells 1 - 8 shall not exceed 4.7 MGD.

Withdrawals from Wells 9 - 17 shall not exceed 1.1 MGD.

Western Wellfield

Total Wells: 18

Limitations: The combined withdrawals from 20-Series and Golf Course wellfields shall not exceed 17.26 MGD. The withdrawals from the Morikami Park wellfield shall not exceed 5.60 MGD.

Monitoring Wells:

Water Quality Monitoring Program Wells:

Alternative Water Sources:

Reclaimed Water: Municipal golf course, Hamlet Golf Course and Fairways of Delray receive reclaimed water from South Central Regional Wastewater Treatment Plant.

Utility Contingency Plan:

An emergency section in the water shortage ordinance and a surcharge for additional use. Will be monitoring eastern wellfield more frequently.

Interconnects & Supply Agreements With Other Utilities:

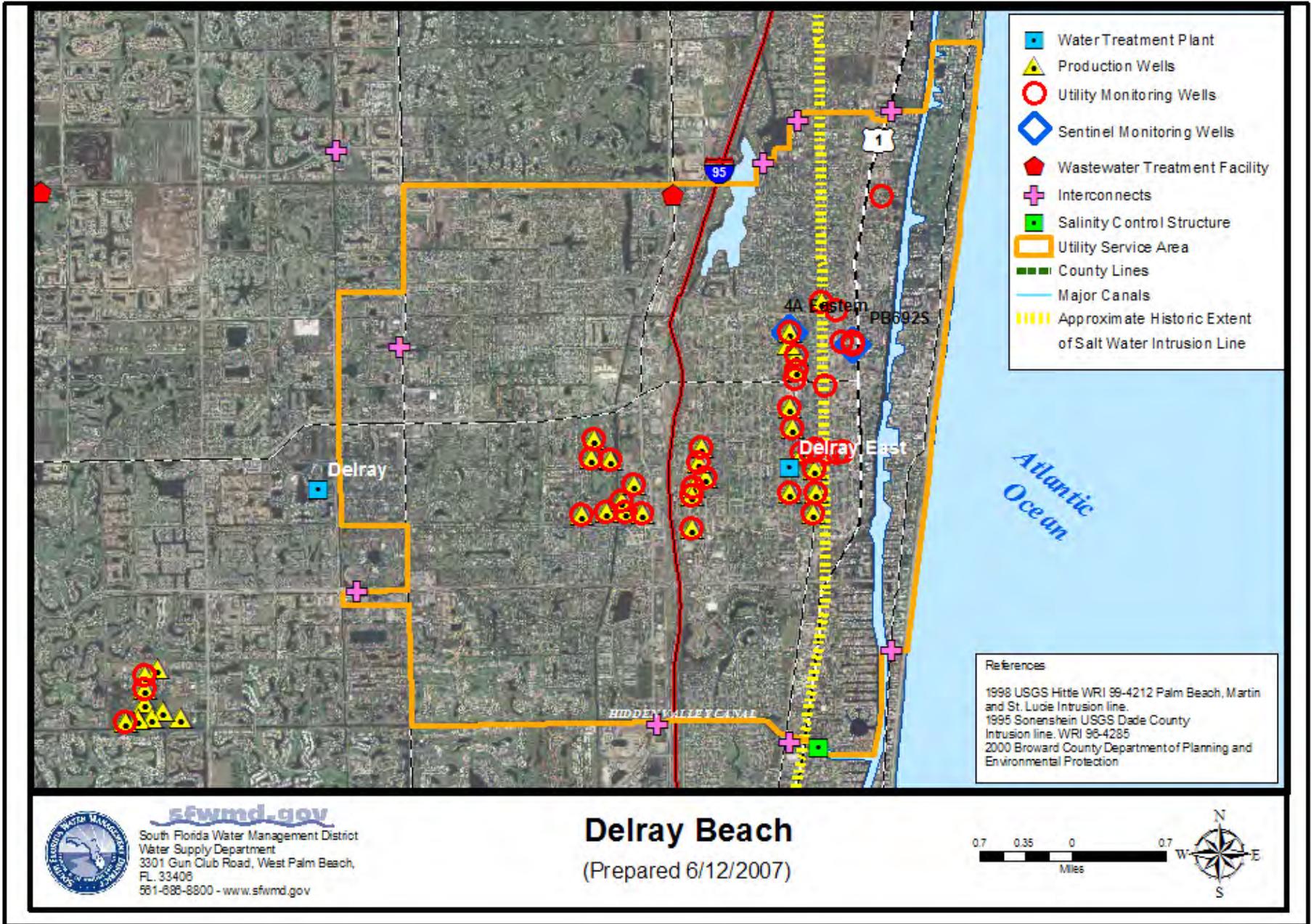
2 interconnects with City of Boynton Beach

2 interconnects with City of Boca Raton

1 existing interconnect and one almost under construction with Palm Beach County

1 interconnect A1A with Highland Beach

Provide wholesale water to Town of Gulfstream (2 meters; 6" & 8")



BOCA RATON

Utility Contact: Lisa Wilson-Davis (561) 338-7310 LWilsonDavis@ci.boca-raton.fl.us

SFWMD Coordinator: Davies Mtundu (561)-682-6581 dmtundu@sfwmd.gov

SFWMD Permit Reviewer: Paulette Glebocki (561)-682-6941 pglebock@sfwmd.gov

Water Use Permit #: 50-00367-W Issued: 4/12/2001 Expired: 4/12/2006 (Application in-house)

Source: Biscayne Aquifer

Annual Allocation: 17,743 MG (48.61 MGD)

Max. Month. Allocation: 64.65 MG

2005 Pumpage: 42.69 MGD

2006 Pumpage: 44.30 MGD

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 70 MGD

Treatment Method: Lime softening and membrane softening

Supply Sources:

Wellfields: 3 - Northwest, Eastern, Southwest

Northwest Wellfield: 22 wells

Eastern Wellfield: 16 wells

Southwest Wellfield: 13 wells

Monitoring Wells:

Water Quality Monitoring Program Wells: 7; 3 Sentinel wells (PB1457, PB1669 and 3-East)

Alternative Water Sources:

Reclaimed Water Projects: Reclaimed Water Projects: In 1990, as part of the proactive environmental stewardship philosophy of the City of Boca Raton, the city began Project IRIS - In-city Reclamation Irrigation System. The system currently has a capacity of 10 MGD with an in-plant capacity expansion to 15 MGD targeted for completion in late 2009. To date, this project provides an average of 2,131.6 MGY or 5.84 MGD of reclaimed water for irrigation purposes. Along with the in-plant capacity expansion, the city will be constructing a 5 MG offsite storage tank. The city has identified several projects for the expansion of the reclaimed distribution system targeting customers utilizing Biscayne Aquifer wells and potable water. The resulting increased demand from these projects is 2,929.125 MGY or 8.025 MGD; yielding a total reclaimed use of 5,060.726 MGY or 13.865 MGD by 2016.

Utility Contingency Plan:

Shift primary pumping to western wells. Shift to higher percentage use of lime softening treatment process. Continue/increase public education and enforcements efforts.

Use of Reclaimed Water: Boca Raton plans to utilize reclaimed water to recharge the E3 Canal which, in turn, is used to recharge one of their wellfields. This canal-recharge option would require some relaxation of DEP standards (the Utility will communicate with DEP regarding this option).

Interconnects & Supply Agreements With Other Utilities:

All for emergency purposes:

Deerfield Beach: 8-inch connection at 803 GPM capacity at South City Line & A1A (existing)

Deerfield Beach: 8-inch connection at 803 GPM capacity at Hillsboro Canal & I-95 (proposed)

Highland Beach: 10-inch connection at 979 GPM capacity at North City Limits & A1A (existing)

Delray Beach: 8-inch connection at 627 GPM capacity at North City Limits & Dixie Hwy. (existing)

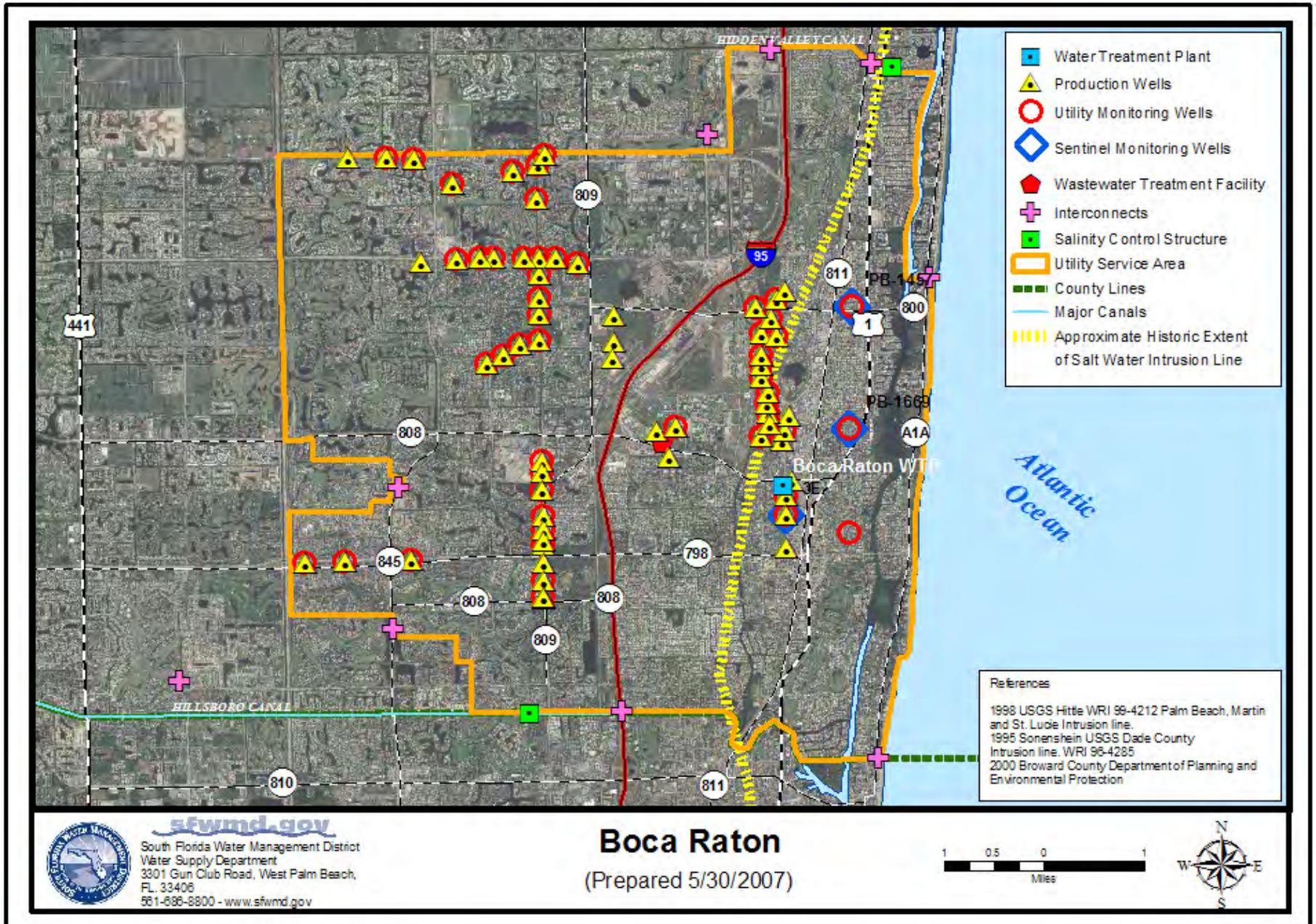
Delray Beach: 8-inch connection at 627 GPM capacity at North City Limits & N. Congress (existing)

Palm Beach County 6-inch connection at 627 GPM capacity at Congress Ave. (existing)

Palm Beach County 10-inch connection at 979 GPM capacity at Jog Road & Sunstream Blvd (existing)

Palm Beach County 8-inch connection at 627 GPM capacity at Jog Road & Canary Palm Drive (existing)

These interconnects are used for emergency purposes only.



DEERFIELD BEACH

Utility Contact: Wayne Miller 954-480-4369 thoney@deerfield-beach.com

SFWMD Coordinator: Kate Edgerton (561) 682-2544 kedger@sfwmd.gov

SFWMD Permit Reviewer: Karin Smith (561) 682-2026 karsmith@sfwmd.gov

Water Use Permit #: 06-00082-W Issued: 9/2004 Expires: 9/2009

Sources: Biscayne Aquifer; One Floridan Aquifer Blending Well (currently not in use)

Annual Allocation: 4,528 MG (12.41 MGD)

Max. Month. Allocation: 437.4 MG

2005 Pumpage: 11.11 MGD

* Implementing membrane filtration treatment at West Treatment Plant, which will increase the demand approximately 15%. If needed, will purchase water from Broward County.

Treatment Facilities:

Number of Facilities: 2 - East and West

Total Capacity: 34.80 MGD

East Wellfield 16.80 MGD; Lime Softening

West Wellfield 18.00 MGD (10.5 MGD Membrane; 7.5 Softening)

Supply Sources:

Wellfields: 2 - Eastern and Western; 1 Floridan Aquifer blending well

Eastern Wellfield - Biscayne Aquifer:

Total Wells: 12

Limitations: Maximum monthly withdrawal of 102 MGM and an annual withdrawal of 1,224 MG (3.35 MGD)

Western Wellfield - Biscayne Aquifer:

Total Wells: 4 (2 more proposed)

Limitations: Maximum monthly withdrawal of 335 MGM and an annual withdrawal of 3,184 MG (8.72 MGD)

Floridan Aquifer Blending Well:

Total Wells: 1

Limitations: 1.0 MGD capacity

* Water from Deerfield Beach's Eastern and Western wellfields are interconnected and can be blended before distribution.

Monitoring Wells:

Water Quality Monitoring Program Wells: 20 wells (17 wells - chloride weekly with water levels monthly; 3 wells - monitored semi-annually).

Sentinel Monitor Well D7 (G2725) is being monitored weekly for chlorides and water level.

Alternative Water Sources:

Floridan Aquifer System blending well - 1.0 MGD production capacity

Utility Contingency Plan:

The contingency plan is to stop pumping the eastern wells and shift pumpage to the Western Wellfield. The city is planning to increase the capacity in the Western Wellfield to promote more flexibility.

Interconnects & Supply Agreements With Other Utilities:

Hillsboro Beach 6" S.E. 10th St. and A1A

Broward County 2A* 8" S.W. 10th St. and Independence Dr.

8" S.E. 17th St. and S.E. 8th St.

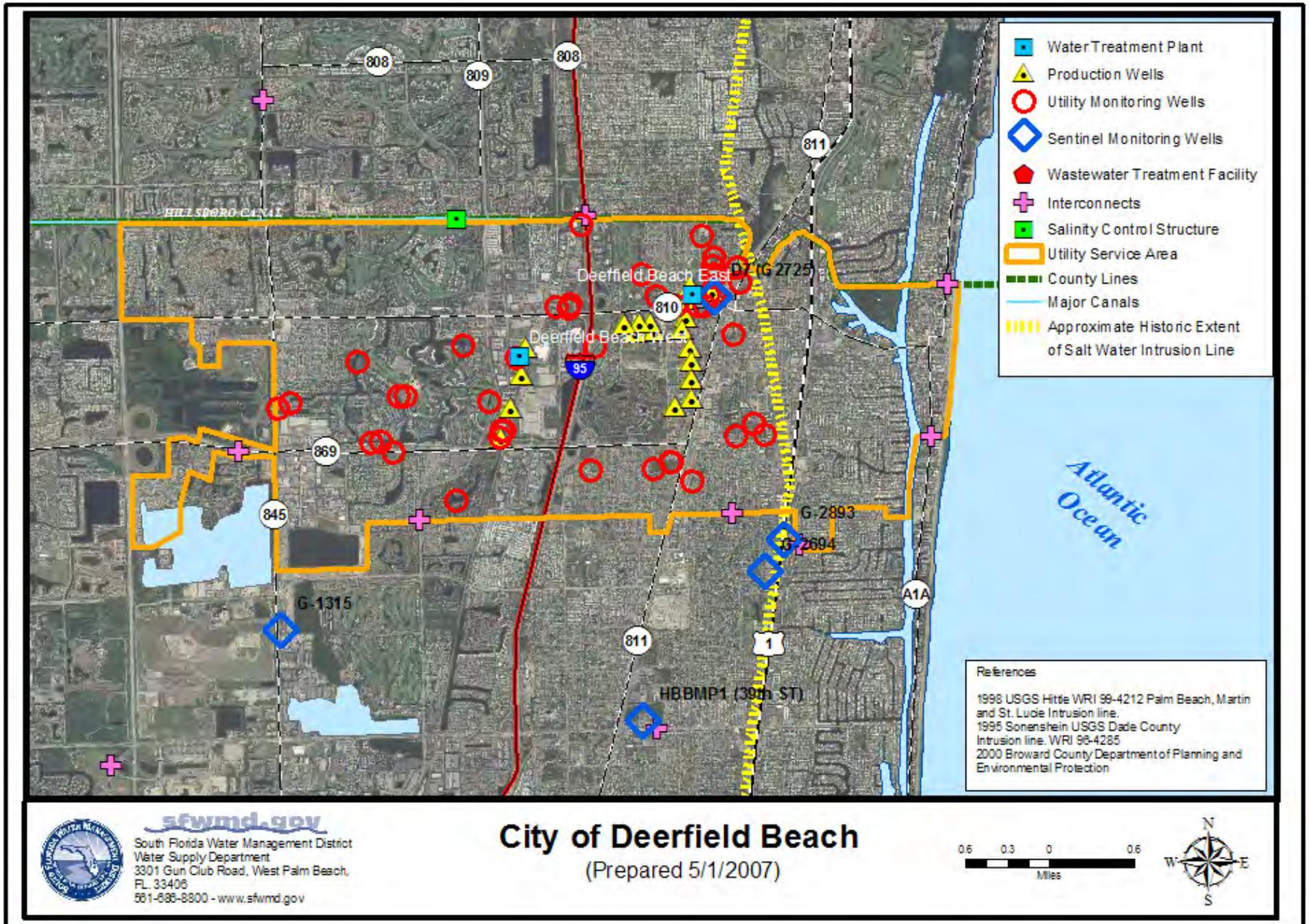
6" S.E. 15th St. and S.E. 2nd Ave.

8" Military Trail south of 10th St.

Boca Raton 6" N.E. 20th Ave. and N.E. 7th St. (one way to Boca Raton)

6" A1A and N.E. 7th St. (one way to Deerfield Beach)

*An agreement to buy a minimum of 0.58 MGD from Broward County North Regional. They have agreements to sell water (only if available) to Hillsboro Beach, Boca Raton and Broward County.



BROWARD COUNTY DISTRICT 2A

Utility Contact: Fran Henderson (954) 831-0760

SFWMD Coordinator: Karin Smith (561) 682-2026 karsmith@sfwmd.gov

SFWMD Permit Reviewer: Karin Smith (561) 682-2026 karsmith@sfwmd.gov

Water Use Permit #:	06-00142-W	Issued: 7/1998	Expired 7/2003* (Application in-house)
	06-01634-W	Issued: 8/2003	Expired 8/2003 (Application in-house)

Sources: Biscayne Aquifer

Annual Allocation: 4,015 MG (11.00 MGD)

Max. Daily Allocation: 13.00 MG

2005 Pumpage: 16.04 MGD

2006 Pumpage: 16.35 MGD

* Broward County District 2A and North Regional permits are being combined under the North Regional permit number (06-01634-W). A permit application is currently under review at the SFWMD.

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 40 MGD

Treatment Method: Lime softening

* Raw water from the North Regional wellfield is also treated at this plant.

Supply Sources:

Wellfields: 2 - 2A and North Regional

2A Wellfield:

Total Wells: 8 Biscayne Aquifer (Wells 1, 2, and 3 have been abandoned; Well 5 is not used)
1 Floridan Aquifer Well (currently inactive)

Limitations: Maximum daily allocation of 13.00 MGD. Total well capacity is 31 MGD

North Regional Wellfield:

Total Wells: 10 Biscayne Aquifer wells

Limitations: Maximum daily allocation of 10 MGD. Can pump 12.4 MGD for 5 days per year

Monitoring Wells:

Water Quality Monitoring Program Wells: 18

Use a cluster of early warning monitor wells (2600 series); Monitor Well 2694 is the sentinel well.

Alternative Water Sources:

Aquifer storage and recovery (ASR) 3.5 MGD capacity

* ASR well is not active. Broward County is pursuing a permit to operate.

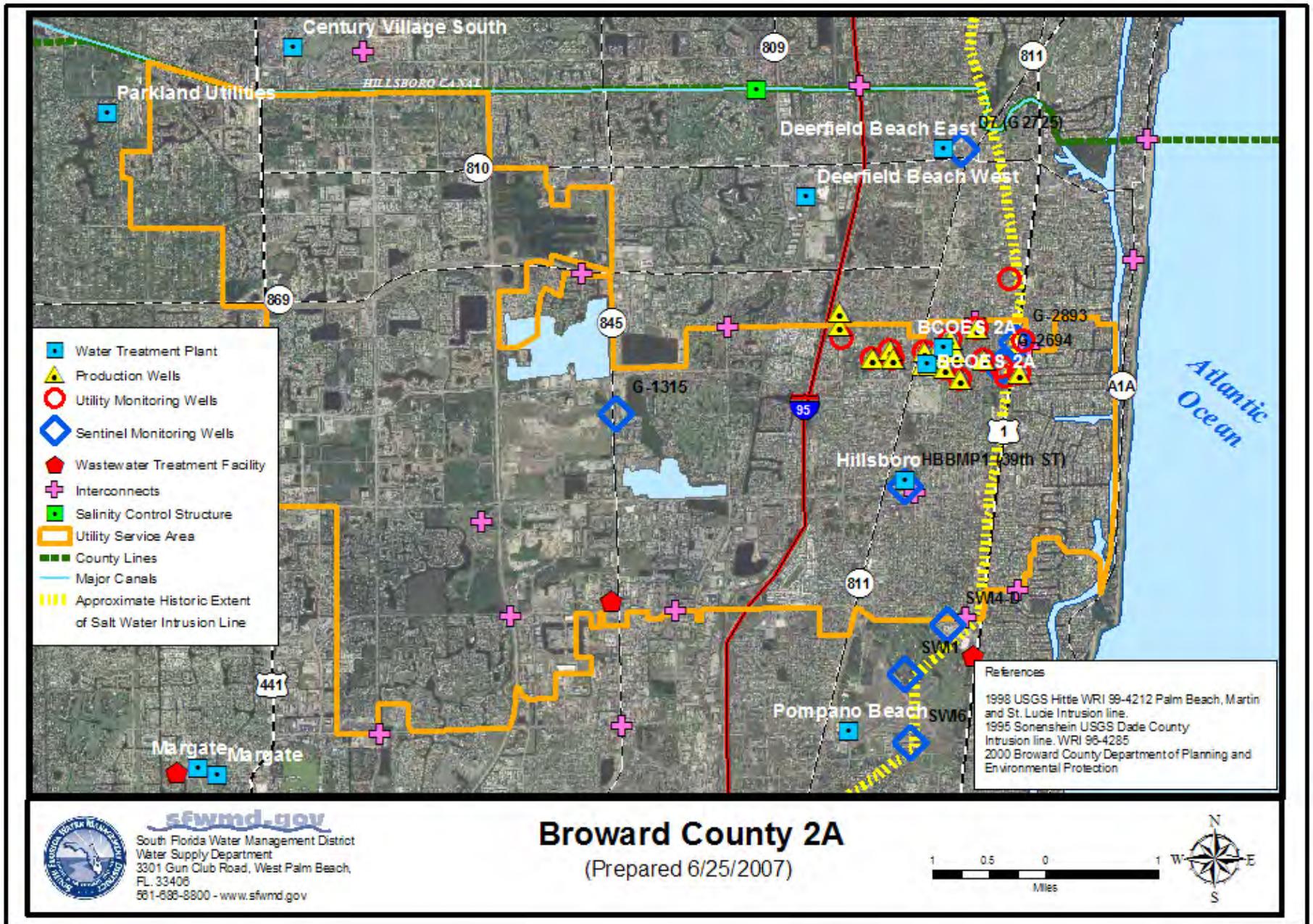
Utility Contingency Plan:

The contingency plan is to divert Biscayne Aquifer withdrawals to the North Regional Wellfield, which has a 20 MGD capacity. The pending water use permit, that combines 2A and North Regional, would allow greater flexibility between the two systems.

Interconnects & Supply Agreements With Other Utilities:

Deerfield Beach*	6" SE 8 Ave. and SE 17 St. 6" SE 15 St. and NE 17 Ave. 12" SW 15 St. and Military Trail
Pompano Beach	8" Hillsboro Plt. 926 and East Sample Rd. 12" W Copans and NW 15 Ave.
Palm Beach County	18" Lyons Rd. and Hillsboro Canal (through North Region)
Coconut Creek	18" W Copans west of FL Turnpike 18" Turnpike and W Sample Rd.

*An agreement, by contract, to provide 0.59 MGD to Deerfield Beach



POMPANO BEACH

Utility Contact: Randy Brown (954) 545-7044 Randolph.Brown@copbfl.com

SFWMD Coordinator: Mark Elsner (561) 682-6156 melsner@sfwmd.gov

SFWMD Permit Reviewer: Jeff Scott (561) 682-6924 jscott@sfwmd.gov

Water Use Permit #: 06-00070-W Issued: 9/2005 Expires: 9/2025

Source: Biscayne Aquifer

Annual Allocation: 7,067 MG (19.36 MGD)

Max. Month. Allocation: 665.1 MG

2005 Pumpage: 17.57 MGD

* These allocations are authorized through 8/10/2010. After 8/10/2010, the annual allocation shall not exceed 6,478 MG and the maximum monthly shall not exceed 610 MG.

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 50 MGD

Treatment Method: 40 MGD lime softening; 10 MGD membrane softening

Supply Sources:

Wellfields: 2 - Eastern (Airport) and Western (Palm Aire)

Eastern Wellfield:

Total Wells: 15

Limitations: Maximum month allocation limited to 186 MG from 11/1 through 5/31; 279 MG from 6/1 through 10/31.

Western Wellfield:

Total Wells: 10

Limitations: None

Monitoring Wells:

Water Quality Monitoring Program Wells: 10

Alternative Water Sources:

Reclaimed Water 7.50 MGD production capacity

1.39 MGD used in 2005

Users: Pompano Beach GC, medians, residential lots, parks, commercial properties and Lighthouse Point medians

Utility Contingency Plan:

If necessary, shift as much pumpage to Western Wellfield as possible. Monitor conductivity levels weekly.

Interconnects & Supply Agreements With Other Utilities:

Eastern and Western wellfields interconnected.

Broward County 2A* 12" 1 MGD at Copans Rd & 15th St.

Broward County 2A* 12" 1 MGD near SW 18th St. & Powerline Rd.

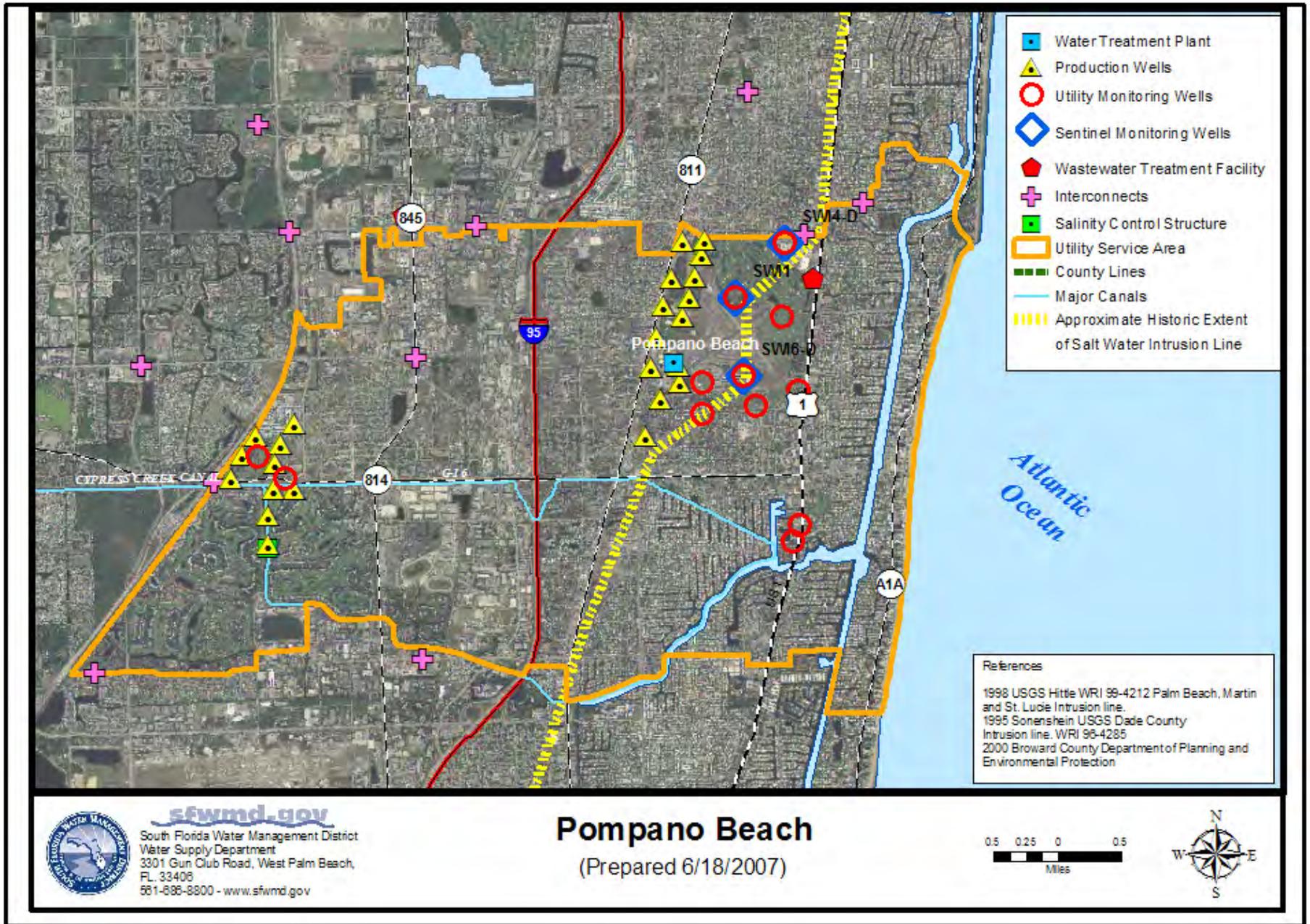
Ft. Lauderdale* 12" 1 MGD near SW 15th St. & Powerline Rd.

Ft. Lauderdale* 6" 6800 NE 20th Terr., Ft. Lauderdale

Margate 10" 3100 MLK Blvd., Pompano Beach

Margate 12" 3300 W. Atlantic Blvd., Pompano Beach

*No agreements or volumes specified. Water provided if called upon & available.



FORT LAUDERDALE

Utility Contact: Rick Johnson (954) 828-7865 RJohnson@fortlauderdale.gov

SFWMD Coordinator: Barbara Powell (561) 682-2236 Bpowell@sfwmd.gov

SFWMD Permit Reviewer: John Lockwood (561) 682-6884 jlockwo@sfwmd.gov

Water Use Permit #: 06-00123-W Issued: 5/9/2004 Expires: 5/9/2007

Sources: Biscayne Aquifer

Annual Allocation: 18,469 MG (50.60 MGD)

Max. Month. Allocation: 67.30 MGD

2006 Pumpage: 48.94 MGD

* Future treatment is expected to be reverse osmosis for the Peele/Dixie.

Treatment Facilities:

Number of Facilities: 2 - Fiveash, Peele/Dixie

Total Capacity: 90.00 MGD

Fiveash 70 MGD: Lime Softening

Peele/Dixie 20 MGD: Lime Softening (future membrane plant)

Supply Sources:

Wellfields: 2 - Prospect and Dixie

Prospect Wellfield - Biscayne Aquifer:

Total Wells: 52

Limitations:

Dixie Wellfield - Biscayne Aquifer:

Total Wells: 35

Limitations: Maximum monthly withdrawal greater than 10-15 MGD will require written approval from the District.

Monitoring Wells:

Water Quality Monitoring Program Wells: Peele/Dixie: 5 wells; Prospect: 5 wells

Sentinel Monitor Wells: MW2, MW6 monitored weekly for chlorides, conductance and water level.

Alternative Water Sources:

Future - Floridan Aquifer System

Utility Contingency Plan:

The city has several contingency plans on file as part of their Emergency Response Plan; however, there are no contingency plans on record concerning drought conditions.

Interconnects & Supply Agreements With Other Utilities:

Broward County;

1) 3400 SW 9 Ave. 8" interconnect

2) 3400 SW 2 Ave. 6" interconnect

3) Cypress Creek Road and Powerline Road, NE corner, 10" interconnect

4) NW 19th St. and NW 24 Ave., NW corner, 6" interconnect

5) Broward Blvd and SW 34 Ave., SE corner, 10" interconnect

Plantation; Peters Road and St. Rd. 7, NE corner, 8" interconnect

Dania; Removed

Davie; 2600 SW 40 Ave., 6" interconnect

Pompano Beach; NE 20 Terr. and NE 68th St., NE corner, 6" interconnect

HOLLYWOOD

Utility Contact: Taylor Calhoun (954) 967-4230 tcalhoun@hollywoodfl.org
SFWMMD Coordinator: Davies Mtundu (561) 682-6581 dmtundu@sfwmd.gov
SFWMMD Permit Reviewer: Tom Colios (561) 682-6944 tcolios@sfwmd.gov

Water Use Permit #: 06-00038-W Issued: 12/12/2002 Expires: 12/12/2007

Sources: Biscayne Aquifer System (BAS) and Floridan Aquifer System (FAS)

Annual Allocation: 9,709 MG (26.6 MGD)

Max. Month. Allocation: 1,085 MG

2005 Pumpage: 23.36 MGD BAS
0.58 MGD FAS

2006 Pumpage: 22.75 MGD [21.39 MGD (BAS), 1.36 MGD (FAS)]
5.23 MGD raw water purchased from Broward County Piccolo Wellfield

* The following limitations to annual withdrawals from specific sources are stipulated:

- Biscayne Aquifer-Chaminade Wellfield: 5,475 MG
- Biscayne Aquifer-South Wellfield: 3,577 MG

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 55.50 MGD

Treatment Method: 3 Systems - lime softening; membrane softening (nanofiltration); reverse osmosis (RO) (2 RO trains, each at 2MGD, but only one train has been operational since implementation of the RO system).

* Current capacity is 40 MGD (includes 2 MGD from the one operational RO membrane train)

Supply Sources:

Wellfields: 2

Biscayne Aquifer: Chaminade Wellfield: Limited to 5,475 MG
South Wellfield: Limited to 3,577 MG

Total Wells: 16

Floridan Aquifer:

Total Wells: 4 (3 are being used currently, withdrawing 2.5 MGD; the 4th has never been fully developed)

Raw water is also available from Broward County South Regional System (Brian Piccolo Park Wellfield).

Monitoring Wells:

Water Quality Monitoring Program Wells: 7 wells are monitored by contract with the USGS. One of those wells (Sentinel Well), G2956, is monitored weekly. Historically, there have been no salt-water intrusion problems and current indications are that there will not be any in the near future.

Alternative Water Sources:

Reclaimed Water: 2 MGD are currently being delivered to golf courses; 2.9 MGD were used in 2005 on the average; two FAS Aquifer wells are planned for 2008; a new membrane treatment skid will produce an additional 2 MGD.

Utility Contingency Plan:

Saltwater monitoring program (SALT): Because of the threat of saline intrusion into the existing north wellfield, Staff recommend that the two remaining standby wells (20 & 21) not exceed the pumpages (0.75 MGD) simulated in the previously approved modeling pursuant to Limiting Condition No. 24. The use of the southern and western wellfields in conjunction with the abandonment of the eastern (north & plant) wellfield will result in increased water levels in the vicinity of the saline water interface. Expect to increase raw-water purchase from the Broward County Piccolo Wellfield. Actually, Hollywood has already increased raw water purchases to approximately 7 million gallons per day. Conservation measures to include taking off irrigations end-users off the potable water supply Interconnects need to address distribution pressures; most end users are getting their deliveries at pressures ranging from 57 to 60 psi whereas some have it from 45 to 48 psi; any lower pressures would result in boil-water notices.

HOLLYWOOD (Continued)

Interconnects & Supply Agreements With Other Utilities:

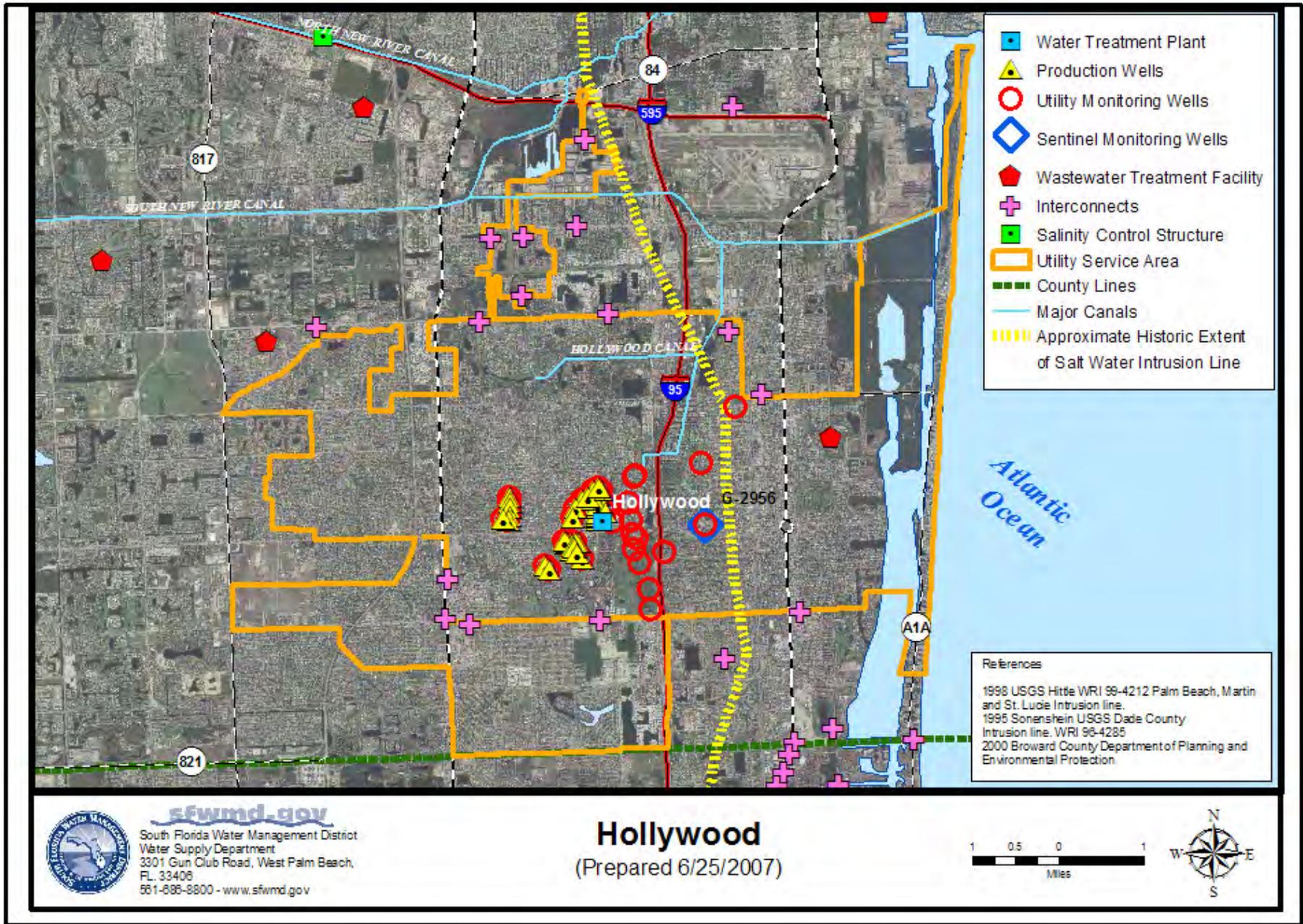
Emergency interconnects with: City of Dania (2) 6"; City of Hallandale 6"; City of Pembroke Pines (2) 8"; Broward County Utilities 8". The Broward County Utilities interconnect has been used on a continuous basis since Aug 1989 to provide treated water to the Broward County 3C service area. A permanent interconnect has been completed as part of the "Finished Water for Resale" agreement between the city and the county and the city is providing treated water to the Broward County 3A, 3B and 3C service areas.

The interconnects are as follows:

Broward County BCA-3A-1: 10-inch interconnection @ 7.92 MGD at N 56th Ave. & Stirling Rd. (existing)
Broward County BCA-3A-2: 10-inch interconnection @ 7.92 MGD at N Park Rd. & Stirling Rd. (existing)
Broward County BCA-3A-3: 16-inch interconnection @ 28.7 MGD at SW 40th Ave. & Griffin Rd. (existing)
Broward County BCA-3B-1: 10-inch interconnection @ 7.92 MGD at Pembroke Rd. & Park Rd. (existing)
Broward County BCA-3C-1: 8-inch interconnection @ 5.76 MGD Fletcher St. & S.R. 7 (existing)
Broward County BCA-3C-2: 8-inch interconnection @ 5.76 MGD SW 3rd Ave. & Sheridan St. (existing)
Dania Beach DB-1: 6-inch interconnection @ 1.87 MGD at SW 3rd Ave. & Sheridan St. (existing)
Dania Beach DB-2: 6-inch interconnection @ 1.87 MGD at Attucks Mid-School at Meade St. (existing)
Davie DV-1: 8-inch interconnection @ 5.76 MGD Davie Rd. Extension & Stirling Rd. (existing)
Unincorporated Hollywood HWD-3A-1: 4-inch interconnection @ 0.94 MGD at SW 36th St. & SW 30th Ave.
Unincorporated Hollywood HWD-3A-2: 10-inch interconnection @ 7.92 MGD at SW 30th & Griffin Rd.
Unincorporated Hollywood HWD-3A-3: 8-inch interconnection @ 9.36 MGD at Oakridge Dr. & Griffin Rd.
Unincorporated Hollywood HWD-3A-4: 8-inch interconnection @ 9.36 MGD at Oakridge Dr. & SW 57th Pl.

* 1) All interconnects are one-way from the city to the customer. 2) The interconnects with Cities of Hallandale and Pembroke Pines have been disconnected.

Extra raw water interconnect: The city has a 24" interconnect to receive raw water from the Brian Piccolo Park Wellfield.



NORTH MIAMI BEACH

Utility Contact: Glenn Humphrey (954) 232-2615 glenn.r.humphrey@mwhglobal.com

SFWMD Coordinator: Kate Edgerton (561) 682-2544 kedger@sfwmd.gov

SFWMD Permit Reviewer: John Lockwood (561) 682-6884 jlockwo@sfwmd.gov

Water Use Permit #: 13-00060-W Issued: MM/DD/YYYY Expired: 06/14/2006 (Application In-house)

Source: Biscayne Aquifer and Upper Floridan Aquifer

Annual Allocation: 11,428 MG (31.31 MGD)
9,603 MG (26.31 MGD) from Biscayne Aquifer
1,825 MG (5.00 MGD) from Upper Floridan Aquifer

Max. Month. Allocation: 1,254 MG (41.81 MGD)

2005 Pumpage: 13.7 MGD

2006 Pumpage: 14.2 MGD

Treatment Facilities:

Number of Facilities: 1 Norwood-Oeffler Water Treatment Plant

Total Capacity: 25.5 MGD

Treatment Method: 15.0 MGD lime softening
9.0 MGD membrane (nano filtration) softening
1.5 MGD by-pass pre-filtering and disinfection
6.5 MGD Floridan Aquifer expected operational in July 2007

Supply Sources:

Wellfields: 1 - Western (Norwood-Oeffler Wellfield)

Western Wellfield:

Total Wells: 16

Limitations: None

Monitoring Wells:

Water Quality Monitoring Program Wells: 23

Alternative Water Sources:

6.5 MGD reverse osmosis facility under construction. Expected operational by 7/2007.

Utility Contingency Plan:

Norwood Oeffler Wellfield and Miami-Dade Water and Sewer Dept. (MDWASD) are western wellfields. In case of any contingency, the City of North Miami Beach can shift to most appropriate supply.

Interconnects & Supply Agreements with Other Utilities:

Emergency Interconnect Locations:

1	City of Opa Locka	2781 N.W. 151 St.	6" Turbo
2	City of Hallandale	A1A & Massina	6" Turbo x
3	City of Hallandale	A1A & Massina	6" Turbo x
4	MDWASD	19900 N.E. 10 Ave.	10" Turbo
5	MDWASD	19900 N.E. 10 Ave.	10" Turbo
6	City of North Miami	Highland Dr. & N.E. 135 St.	6" Turbo x
7	Village of Bal Harbour	Collins Ave. & Bakers Haul.	6" Turbo x

Existing Bulk Sales Interconnect Locations:

8	City of Hallandale	Bisc. Blvd. & Cnty Line Rd.	8" Turbo x
9	City of Hallandale	Bisc. Blvd. & Cnty Line Rd.	8" Turbo x
10	MDWASD	N.E. 207 St. & 34 Ave.	6" Turbo x (closed permanently)
11	MDWASD	N.E. 207 St. & 34 Ave.	6" Turbo x (closed permanently)
12	MDWASD	N.E. 207 St. & 34 Ave.	10" Turbo x (closed permanently)
13	MDWASD	20700 Biscayne Blvd.	10" Turbo
14	MDWASD	20700 Biscayne Blvd.	4" Turbo

NORTH MIAMI BEACH (Continued)

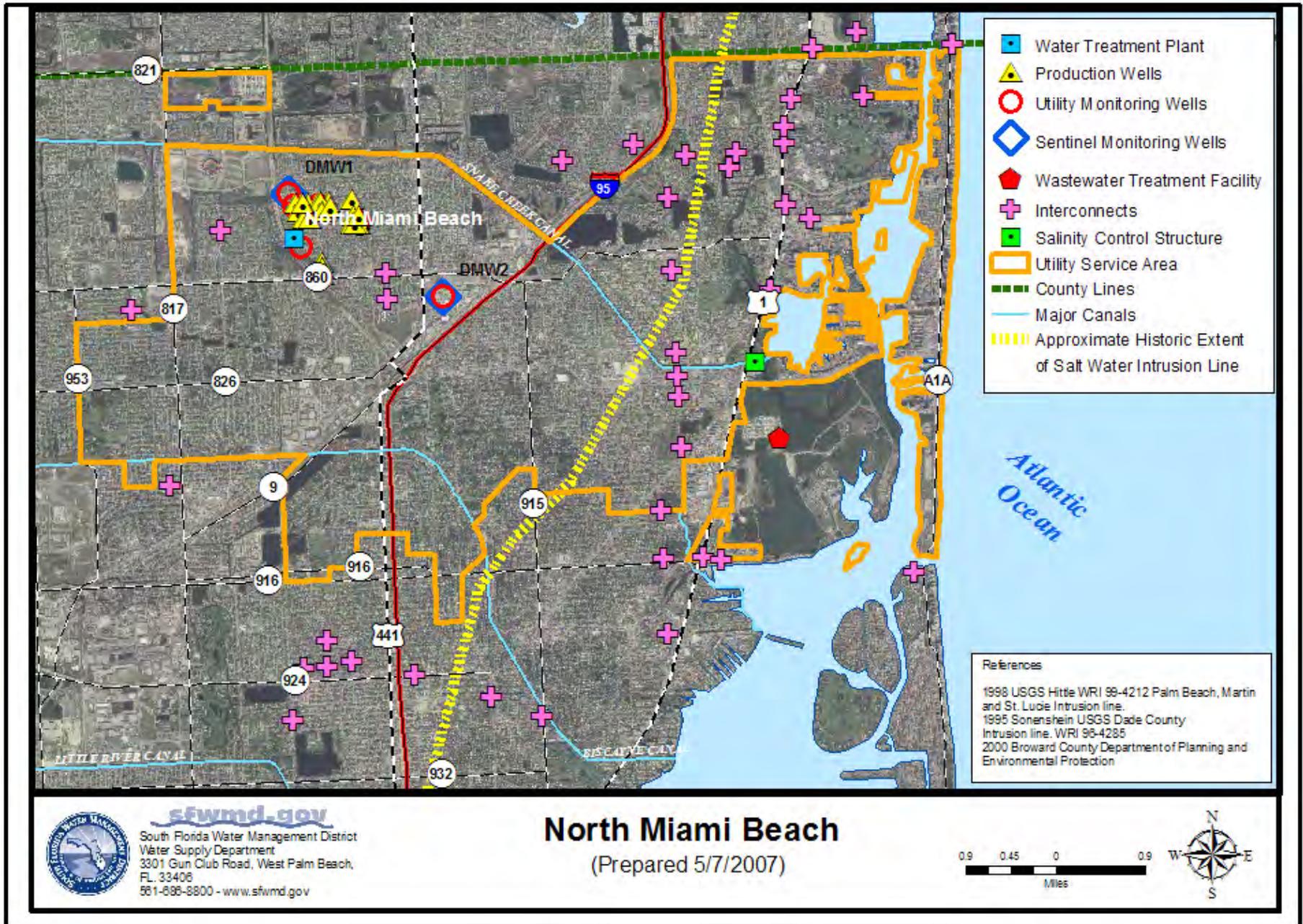
Interconnects & Supply Agreements with Other Utilities (Continued)

15	MDWASD	20300 Biscayne Blvd.	8" Turbo
16	MDWASD	19975 Biscayne Blvd.	8" Turbo
17	MDWASD	19975 Biscayne Blvd.	8" Turbo
18	MDWASD	19101 Biscayne Blvd.	6" Turbo
19	MDWASD	18851 N.E. 29 Ave.	6" Turbo
20	MDWASD	17695 Biscayne Blvd.	6" Turbo (to MDWASD only)
21	MDWASD	17695 Biscayne Blvd.	1.5" (to MDWASD only)
22	MDWASD	17655 Biscayne Blvd.	6" Turbo (to MDWASD only)
23	MDWASD	19891 N.E. 24 Ave.	6" Turbo
24	MDWASD	19700 N.E. 23 Ave.	2"
25	MDWASD	19700 N.E. 23 Ave.	6" Turbo
26	MDWASD	N.E. 19 Ct. & 20 Ave. at 199 St.	6" Turbo
27	MDWASD	N.E. 19 Ct. & 20 Ave. at 199 St.	6" Turbo
28	MDWASD	20101-29 N.E. 15 Ct.	8" Turbo
29	MDWASD	20101-29 N.E. 15 Ct.	8" Turbo
30	MDWASD	10300 N.W. 5 Ct.	6" Turbo
31	MDWASD	17900 N.W. 5 Ave.	2" Turbo
32	MDWASD	N.E. 212 St. & Bisc. Blvd.	8" Turbo
33	MDWASD	N.E. 212 St. & Bisc. Blvd.	8" Turbo
34	MDWASD	36 Ave. / N.E. 207 St.	6" Turbo
35	MDWASD	36 Ave. / N.E. 207 St.	6" Turbo
36	MDWASD	20403 Biscayne Blvd.	6" Turbo
37	MDWASD	20403 Biscayne Blvd.	6" Turbo
38	MDWASD	17985 Biscayne Blvd.	2"
39	MDWASD	17985 Biscayne Blvd.	2"
40	MDWASD	20955 Biscayne Blvd.	2"

Western wellfields interconnected

Active Bulk Water Purchase Interconnect

50	MDWASD	N.W. 179 St. & N.W. 31 Ave.	(2) 10" Compound
51	MDWASD	N.W. 22 Ave. & N.W. 191 St.	(1) 6" Turbo
52	MDWASD	N.W. 8 Ave. & N.W. 191 St.	(2) 10" Venturi
53	MDWASD	N.E. 18 Ave. & N.E. 181 St.	(2) 8" Turbo
54	MDWASD	N.E. 18 Ave. & N.E. 168 St.	(2) 6" Turbo
55	MDWASD	N.E. 18 Ave. & N.E. 164 St.	(2) 6" Turbo
56	MDWASD	N.E. 18 Ave. & N.E. 161 St.	(1) 36" Venturi
57	MDWASD	N.E. 18 Ave. & N.E. 168 St.	(2) 8" Turbo
58	MDWASD	N.E. 18 Ave. & N.E. 193 St.	



NORTH MIAMI

Utility Contact: Gary Demorest (305) 953-2855 gsdemo@comcast.net
SFWMD Coordinator: Kate Edgerton (561) 682-2544 kedger@sfwmd.gov
SFWMD Permit Reviewer: John Lockwood (561) 682-6884 jlockwo@sfwmd.gov

Water Use Permit #: 13-00059-W Issued: 12/12/2002 Expires: 12/12/2007

Source: Biscayne Aquifer

Annual Allocation: 3,395 MG (9.30 MGD)

Max. Month. Allocation: 279 MG

2005 Pumpage: 8.6 MGD: Purchases from Miami-Dade Water and Sewer Dept. (MDWASD) were
4.2 MGD.

2006 Pumpage: 7.9 MGD

Treatment Facilities:

Number of Facilities: 1 - Norman H. Winson Treatment Plant

Total Capacity: 9.3 MGD

Treatment Method: Lime softening, filtration and disinfection (chloramines)

Supply Sources:

Wellfields: 1 - Eastern

Eastern Wellfield:

Total Wells: 14

Limitations: There were some concerns about harmful saltwater intrusion and therefore the applicant subsequently requested a renewal of the permit for the existing allocation of 9.3 MGD.

Monitoring Wells:

Water Quality Monitoring Program Wells: 19 (17 of these wells are for the Biscayne Aquifer)

Alternative Water Sources:

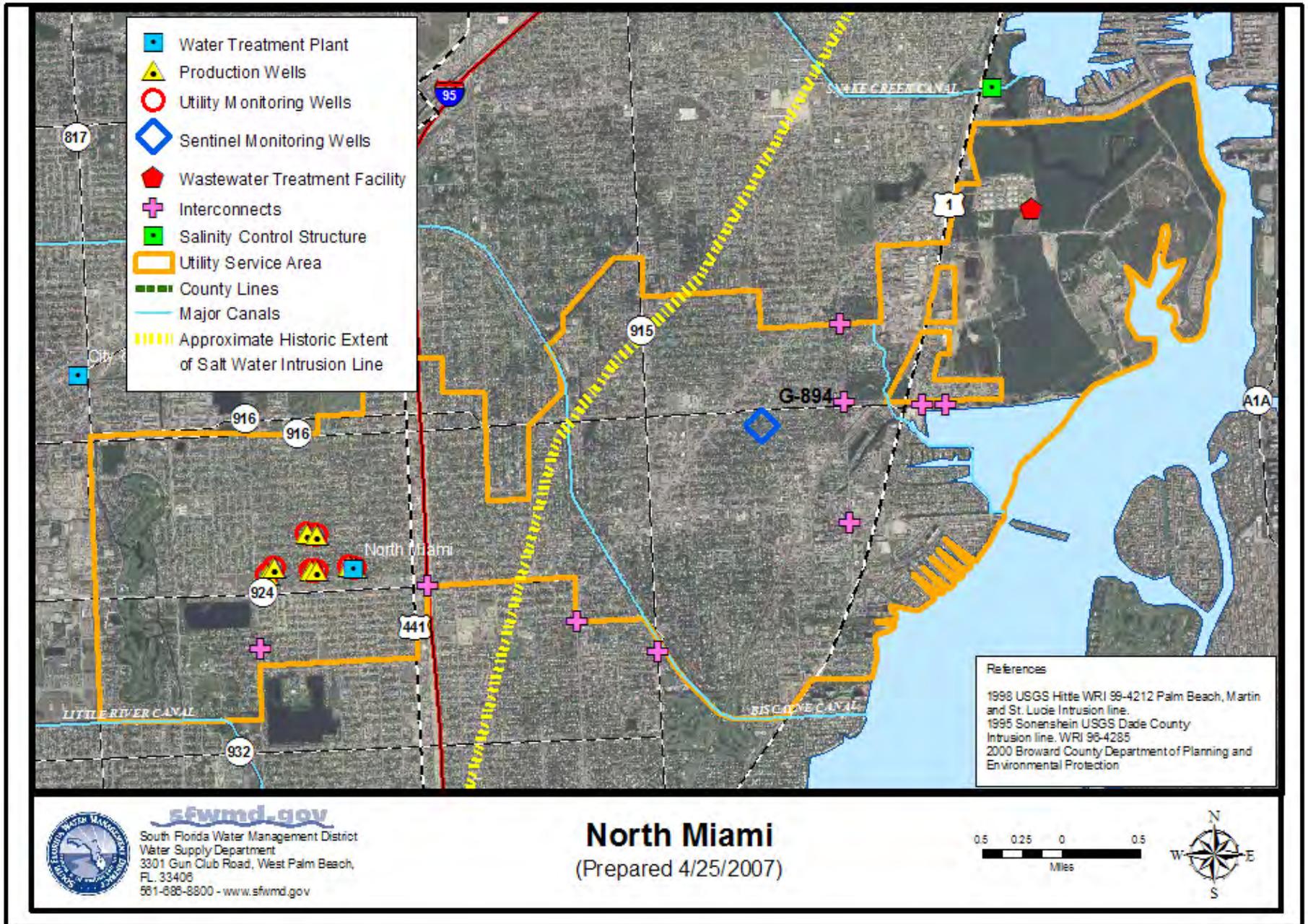
None

Utility Contingency Plan:

The utility will investigate if a written contingency plan exists. Currently, it appears to be ad-hoc.

Interconnects & Supply Agreements with Other Utilities:

The city has seven metered interconnections with MDWASD and one emergency locked metered connection with the City of North Miami Beach. There are 2 inter-local agreements with North Miami Beach and City of Opa-laka.



HIALEAH/PRESTON (NORTH MIAMI-DADE)

Utility Contact: Ralph Terrero (786) 552-8112 work (786) 229-0702 cell TERRERO@miamidade.gov

SFWMD Coordinator: Karin Smith (561) 682-2026 karsmith@sfwmd.gov

SFWMD Permit Reviewer: Karin Smith (561) 682-2026 karsmith@sfwmd.gov

Water Use Permit #: 13-00037-W Issued: 2/11/1999 Expired 2/2004* (Application in-house)

Source: Biscayne Aquifer

Annual Allocation: 72,703 MG (199 MGD)

Max. Month. Allocation: 235 MGD Max Day

2005 Pumpage: 163 MGD

2006 Pumpage: 164 MGD

* This permit is being combined with two other permits and the combined allocation is limited to 349.76 MGD per an interim water use agreement.

Treatment Facilities:

Number of Facilities: 2

Total Capacity: 225 MGD - Preston 165 MGD; Hialeah 60 MGD

Treatment Method: 225 MGD lime softening

Supply Sources:

Wellfields: 4 - Preston/Hialeah, Miami Springs Upper and Lower, Northwest

Preston/Hialeah Wellfield:

Total Wells: 10 (81.36 MGD max capacity)

Limitations: 70 MGD limit from Hialeah/Preston and Miami Springs combined, 2 miles to salt intrusion line

Miami Springs Upper Wellfield:

Total Wells: 12 (45.6 MGD max capacity)

Limitations: 70 MGD limit from Hialeah/Preston and Miami Springs combined, 2½ miles to salt intrusion line

Miami Springs Lower Wellfield:

Total Wells: 8 (30.67 MGD max capacity)

Limitations: 70 MGD limit from Hialeah/Preston and Miami Springs combined, 1¾ miles to salt intrusion line

Northwest Wellfield:

Total Wells: 15 (225 MGD max capacity)

Limitations: 155 MGD (mitigated impacts to wetlands)

Monitoring Wells:

Water Quality Monitoring Program Wells: 10

At salt intrusion line: G-3601, G-3602, G-3604, G-3605, F-45 (sentry well)

East of salt intrusion line: G-3704

West of salt intrusion line: G-548, G-571(sentry well), G-354, G-1351 (sentry well)

Alternative Water Sources:

Reclaimed Water: None

Utility Contingency Plan:

Shift pumpage to Northwest wellfield (currently pumping ~100 MGD).

Interconnects & Supply Agreements With Other Utilities:

The Hialeah/Preston service area has line pressure in the 1960s and the Alexander Orr distribution system has 78 psi at the plant and it reduces to it's lowest pressure at 8th street or Flagler. This allows up to 40 MGD to flow into the Hialeah/Preston distribution system. Because of the pressure differential, water from Hialeah/Preston cannot go to the Alexander Orr service area. Two valved interconnects (48" and 36") are currently being constructed to move water between the two distribution systems. Maimi-Dade Water and Sewer Department (MDWASD) is in the process of doing an analysis on which valves could be closed to push water between the two distribution systems.

ALEXANDER ORR (CENTRAL MIAMI-DADE)

Utility Contact: Ralph Terrero 786-552-8112 work 786-229-0702 cell TERRERO@miamidade.gov
SFWMD Coordinator and Permit: Karin Smith (561) 682-2026 karsmith@sfwmd.gov

Water Use Permit #: 13-00017-W Issued: 5/1995 Expired: 5/2004* (Application in-house)

Source: Biscayne Aquifer

Annual Allocation: 74,000 MG (203 MGD)

Max. Month. Allocation: 242 MGD Max Day

2005 Pumpage: 177 MGD

2006 Pumpage: 176 MGD

* This permit is being combined with two other permits and the combined allocation is limited to 349.76 MGD per an interim water use agreement.

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 248 MGD

Treatment Method: 248 MGD lime softening

Supply Sources:

Wellfields: 4 - Orr, Snapper Creek, Southwest, West

Orr Wellfield:

Total Wells: 10 (74.4 MGD max capacity)

Limitations: None in permit, 3 miles to salt intrusion line

Snapper Creek Wellfield:

Total Wells: 4 (47.8 MGD max capacity)

Limitations: None

Southwest Wellfield:

Total Wells: 17 (142.9 MGD max capacity) + 2 inactive Floridan aquifer storage and recovery (ASR) wells

Limitations: None

West Wellfield:

Total Wells: 3 Biscayne Aquifer (25 MGD max capacity), 3 Floridan Aquifer (15 MGD cap.)

Limitations: Wellfield limit of 15 MGD, Well 29 limited to 5 MGD, Well 31 standby only

Monitoring Wells:

Water Quality Monitoring Program Wells: 9

At salt intrusion line: G-3605, G-3608, G-3609, G-3610

East of salt intrusion line: G-432, G-896

West of salt intrusion line: G-3606, G-3607 (sentry well), G-1009B,

Alternative Water Sources:

Reclaimed Water: None

Aquifer Storage and Recovery: 3 active, 2 inactive wells

Floridan Aquifer Blending: Currently using 3 ASR wells at West Wellfield to blend 3 MGD.

Utility Contingency Plan:

Chloride and water level samples are taken weekly at monitor wells east of the most susceptible wellfields. If chlorides begin elevating in the Snapper Creek wellfield, pumpage would be shifted to the West Wellfield Floridan Aquifer wells used as blending wells. The county is also trying to activate two inactive ASR wells at Southwest for blending purposes. Max 7 MGD Floridan blending due to chloride taste issues. Plenty of unused capacity at Southwest Wellfield available (currently pumping ~90 MGD).

Interconnects & Supply Agreements With Other Utilities:

The Alexander Orr distribution system has 78 psi at the plant and it reduces to its lowest pressure at 8th Street or Flagler. This allows up to 40 MGD to flow into the Hialeah/Preston service area with pressure in the 1960s. Because of the pressure differential, water from Hialeah/Preston cannot go to the Alexander Orr service area. Two valved interconnects (48" and 36") are being constructed to move water between the two distribution systems. Miami-Dade Water and Sewer Dept. (MDWASD) is in the process of analyzing which valves could be closed to push water between the two distribution systems.

SURFACE WATER UTILITIES OF CONCERN: UTILITY SUMMARIES AND MAPS

OKEECHOBEE UTILITY AUTHORITY (OUA)

Utility Contact: John F. Hayford, Director (863) 763-9460 mjhayford@engineer.com

SFWMD Coordinator: Jorge Patino (561) 682-6175 jpatino@sfwmd.gov

SFWMD Permit Reviewer: Donna Moscone (561) 682-6714, mdmoscone@sfwmd.gov

Water Use Permit #: 47-00004-W Issued: 01/10/2002 Expired: 01/10/2007 (Application in-house).

Source: Lake Okeechobee and Surficial Aquifer System (SAS)

Annual Allocation: 1,033 MG (2.83 MGD)

Max. Daily Allocation: 3.85 MGD daily max., SAS limited to 2.2 MGD

2005 Pumpage: 2.03 MGD (739.831 MGY), raw totals both plants

2006 Pumpage: 2.17 MGD (793.141 MGY), raw totals both plants

Treatment Facilities:

Number of Facilities: 2 (one groundwater WTP, and one surface water WTP)

Total Capacity: 6 MGD total (1 MGD Groundwater WTP and 5 MGD Surface WTP (recent DEP permit)

Treatment Method: Groundwater: aeration/chlorination/filtration
Surface Water: aeration, coagulation, sedimentation, ozone, dual media filtration, chlorination

Supply Sources:

Surficial Aquifer System:

Total Wells: (7) 10" diameter wells ranging in depth from 155' to 175', only four have ever been in service (3, 4 and 5 are capped)

Limitations: SAS is limited to 2.2 MGD and has a rated capacity 3.02 MGD

Lake Okeechobee:

Withdrawal Facilities: (2)
Old intake has three (3) pumps to the edge of government cut (approx. 300' long and 9' NGVD);
2001 intake is within 50 feet of old one at approx. 3.5' NGVD

Limitations: Rated capacity 9.79 MGD; pump intake elevations: 9' NGVD (old) and 3.5' NGVD (2001)

Other limitations: In the event of a declared water shortage, water withdrawal reductions will be ordered by the District in accordance with the Water Shortage Plan, Chapter 40E-21, F.A.C., During water shortage, permittee shall submit pumpage reports.

Monitoring Wells:

Lake water has been getting harder from 140 to 200 ppm.

Alternative Water Sources:

None

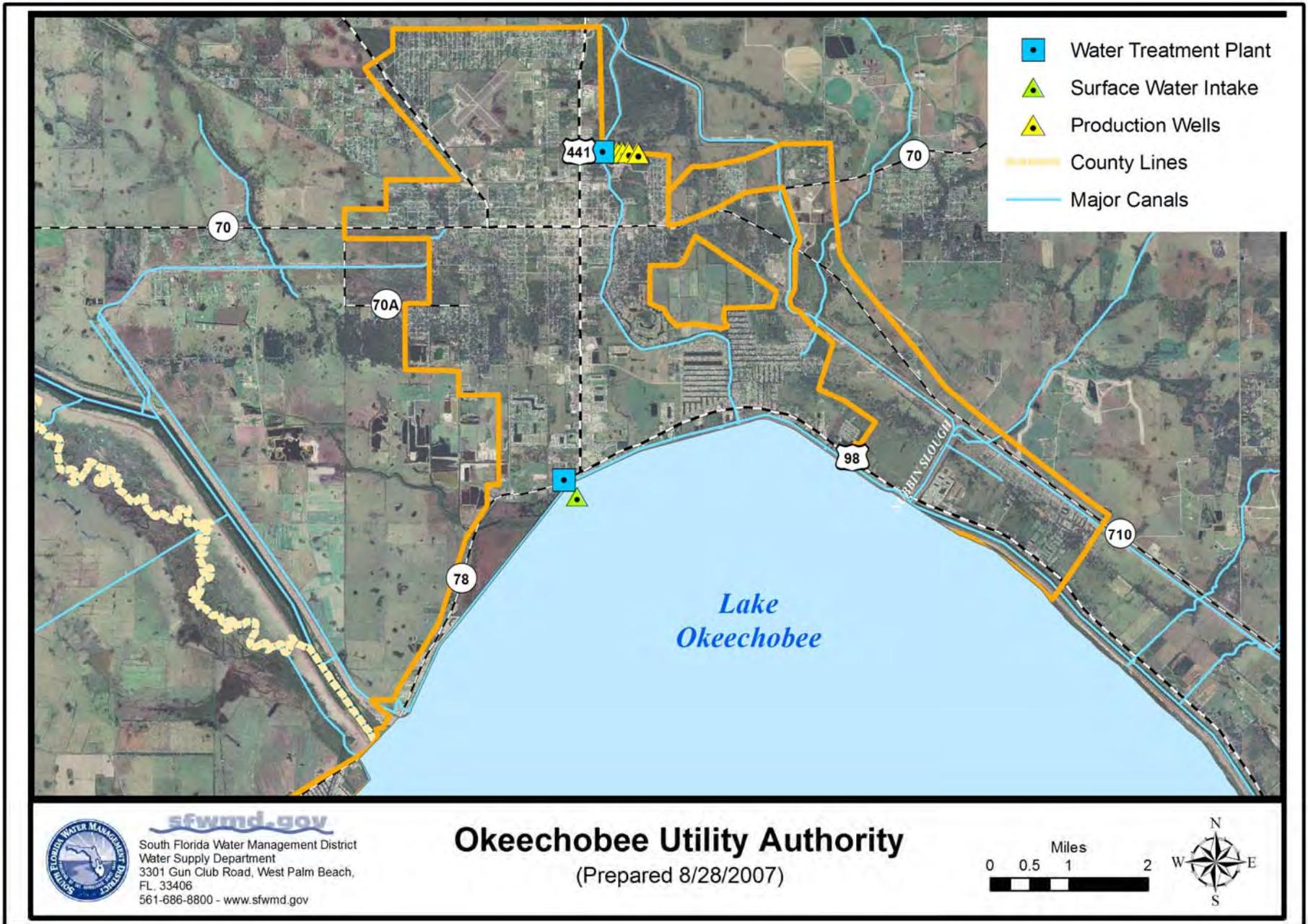
Utility Contingency Plan:

In 2001, a water intake pipe was laid at an invert elevation of 3.5 feet NGVD from a lake intake structure to a new wet well. Two submersible pumps set at elevation 2.0 feet NGVD supply water from the wet well to the main treatment plant. It is anticipated that the treatment plant will be able to draw water from the lake down to elevation 6.5 feet NGVD.

The water plant reported high turbidity and suspended solids due to sediments clogging the Government Cut Intake. The District coordinated with Water plant and the Okeechobee County to cleanout the intake. On May 15, 2007, the intake was completely cleaned out using county facilities. A portable pump was used to supply the plant with water from the rim canal during the cleanout.

Interconnects & Supply Agreements with other Utilities:

None



PAHOKEE

Utility Contact: Lillie Latimore (561) 924-5534

SFWMD Coordinator: Davies Mtundu (561) 682-6581 dmtundu@sfwmd.gov

SFWMD Permit Reviewer: Pending

Water Use Permit #: 50-00473-W Issued: 07/09/1998 Expired 07/09/2003 (Application in-house)

Sources: Lake Okeechobee

Annual Allocation: 295 MG (1.29 MGD)

Max. Month. Allocation: 39.2 MG

2005 Pumpage: 0.96 MGD

2006 Pumpage: 0.95 MGD

Limitations: None stipulated

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 1.8 MGD

Treatment Method: Used to be lime softening, now utilizing a flocculant.

Supply Sources:

Lake Okeechobee

Monitoring Wells:

None

Alternative Water Sources:

None

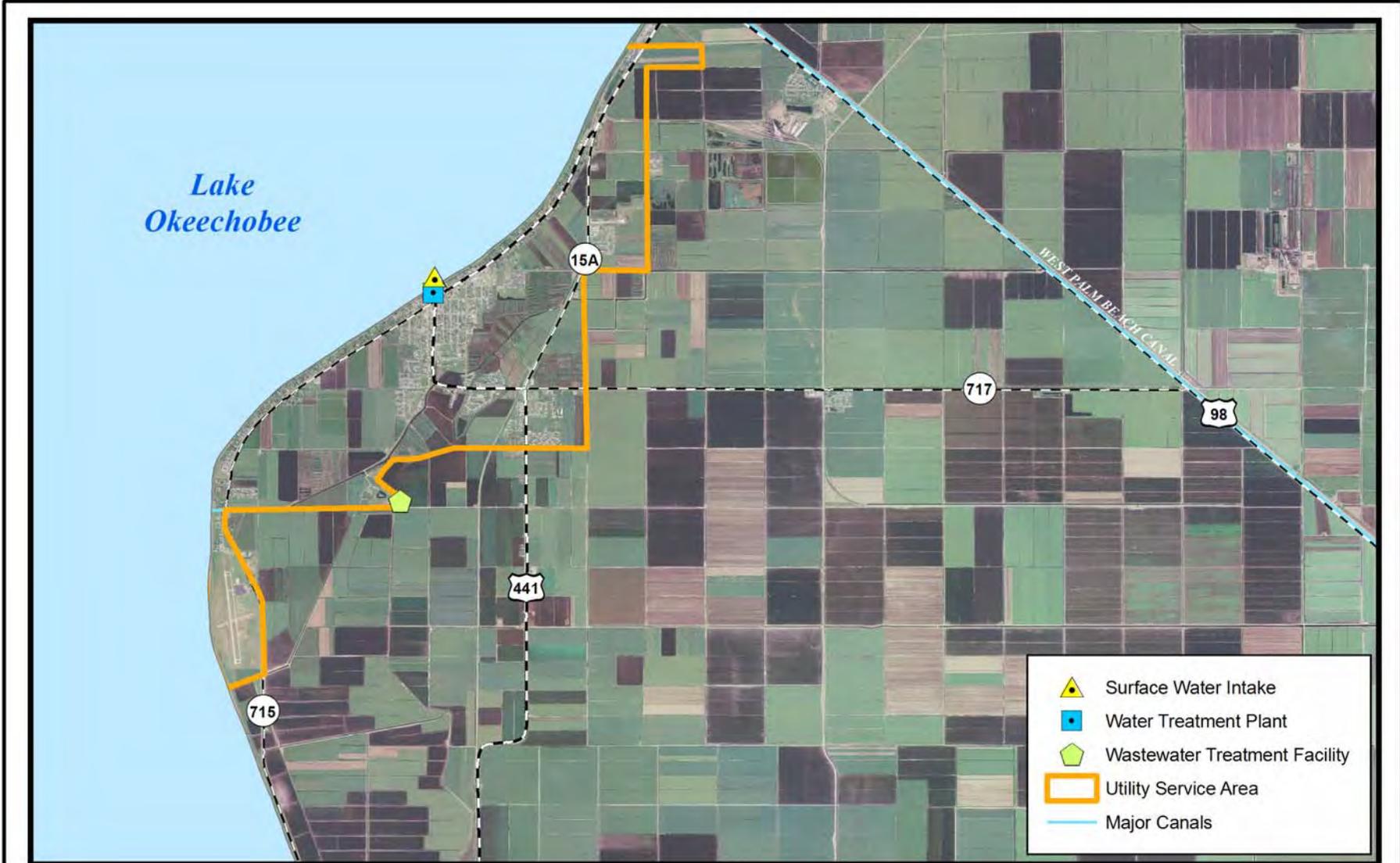
Utility Contingency Plan:

The District installed a back-up intake in 2001, to deliver 1,200 gallons of water per minute, but the electrical installation sustained damages during the 2005 hurricane season. On April 20, 2007, the District completed repairs on the backup intake, which is now fully functional and it is capable of meeting Pahokee's water demands down to elevation 4.0 feet NGVD. The City of Pahokee is expected to get its future water supply from the 10 MGD Lake Region Water Treatment Plant, expected to be completed before July 2008.

The District also modified the primary intake to allow supply down to about elevation 7 feet NGVD.

Interconnects & Supply Agreements With Other Utilities:

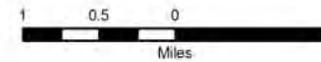
The city has no interconnects with nearby cities.



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Pahokee

(Prepared 8/28/2007)



BELLE GLADE

Utility Contact: Ken Robinson (561) 992-1645

SFWMD Coordinator: Davies Mtundu (561) 682-6581 dmtundu@sfwmd.gov

SFWMD Permit Reviewer: Pending

Water Use Permit #: 50-00454-W Issued: 02/08/2006 Expires: 02/08/2011

Sources: Lake Okeechobee

Annual Allocation: 1,708 MG (4.68 MGD)

Max. Month. Allocation: 160.8 MG

2005 Pumpage: 4.75 MGD

2006 Pumpage: 4.36 MGD

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 8.0 MGD

Treatment Method: Lime softening

Supply Sources:

Lake Okeechobee

Monitoring Wells:

None

Alternative Water Sources:

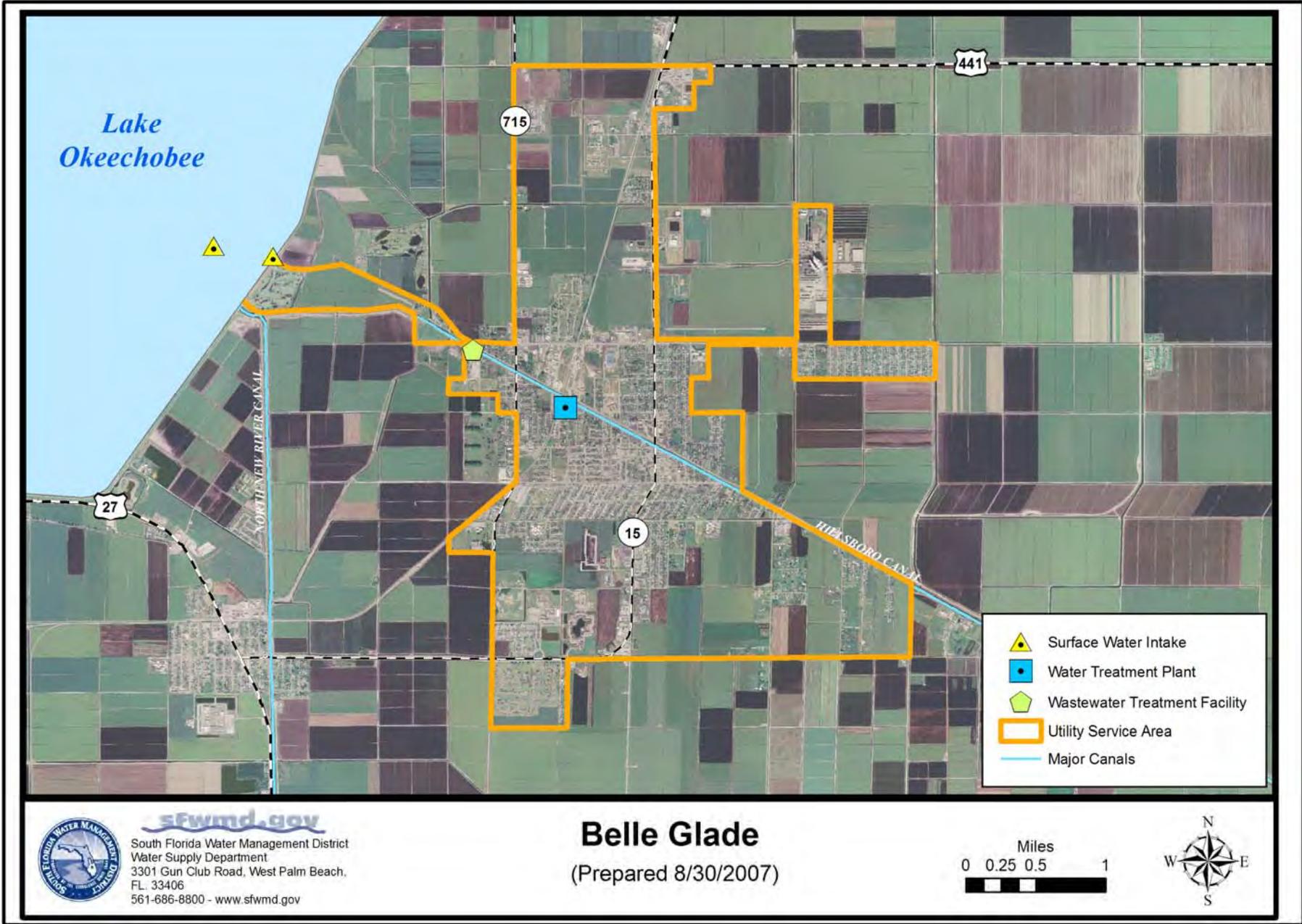
None

Utility Contingency Plan:

An emergency intake was installed in 2001 to ensure that the treatment plant will be able to draw water from the rim canal down to elevation 4 feet, should lake levels drop below 10 ft NGVD. The Plant Manager was contacted in April 2007 and confirmed that water supply equipment is presently functional. The City of Belle Glade is expected to get its future water supply from the 10 MGD Lake Region Water Treatment Plant, expected to be completed before July 2008.

Interconnects & Supply Agreements With Other Utilities:

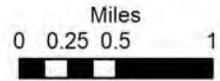
The city has an interconnect with South Bay for a limited supply of water.



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Belle Glade

(Prepared 8/30/2007)



SOUTH BAY

Utility Contact: Allen Davis (561) 996-0520 davisa@southbaycity.com

SFWMD Coordinator: Davies Mtundu (561) 682-6581 dmtundu@sfwmd.gov

SFWMD Permit Reviewer: Pending

Water Use Permit #: 50-00131-W Issued: 10/13/1994 Expired: 10/13/2004 (Application in-house)

Sources: Lake Okeechobee

Annual Allocation: 227 MG (1.02 MGD maximum)

Max. Daily Allocation: 1 MG (estimated)

2005 Pumpage: 0.96 MGD

2006 Pumpage: 1.11 MGD

Limitations: None stipulated

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 2.2 MGD

Treatment Method: Lime softening

Supply Sources:

Lake Okeechobee

Monitoring Wells:

None

Alternative Water Sources:

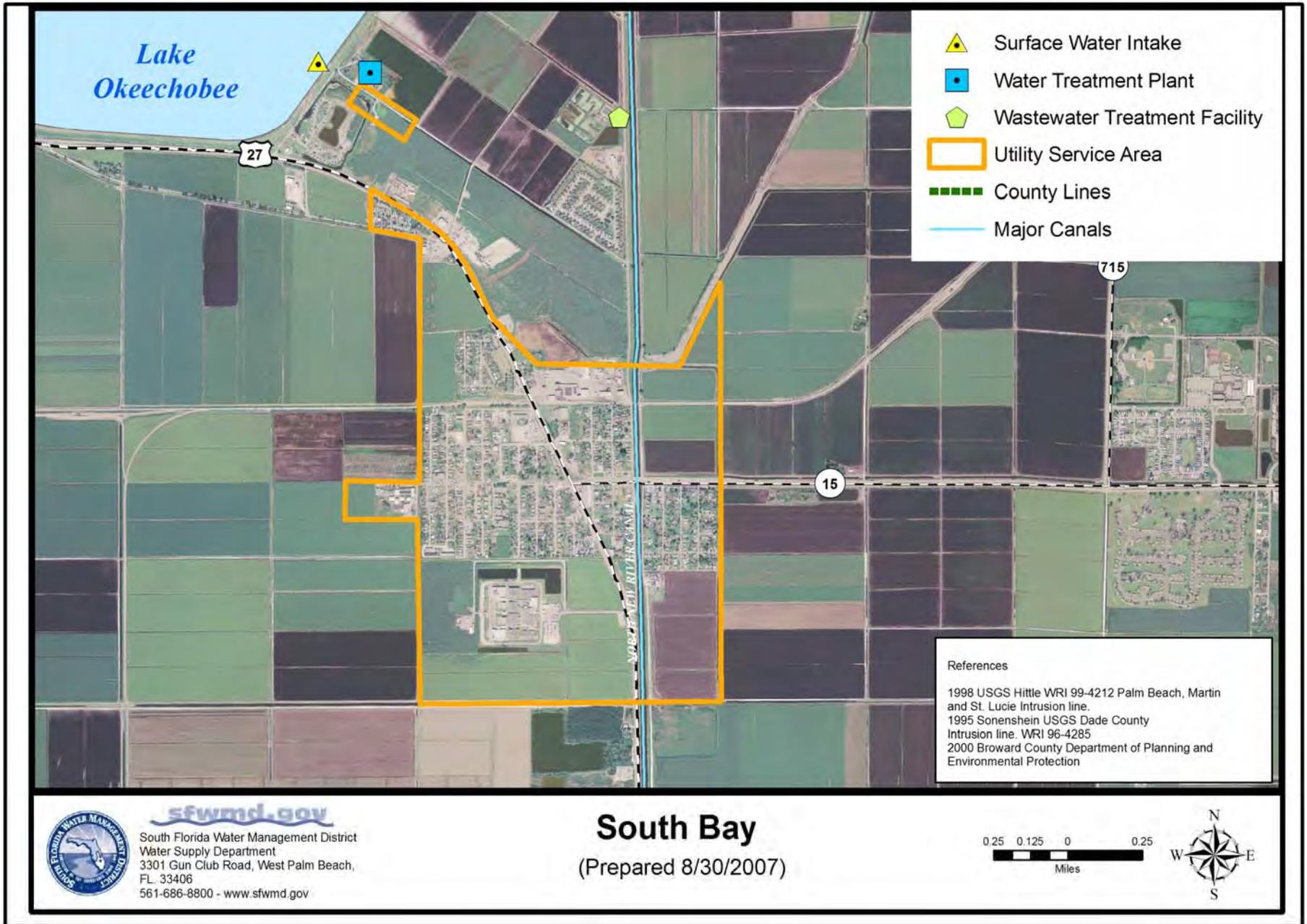
None

Utility Contingency Plan:

The three new 750 gallons per minute per unit pumps that the District replaced in 2001 have strengthened South Bay's contingency plans. The water intake structure is located on the rim canal near the South Bay Municipal Boat Ramp. Elevation of the pump's intake pipes were confirmed by the District's surveyor in August 2007 to average 4.0 feet for the three pumps. The City of South Bay is expected to get its future water supply from the 10 MGD Lake Region Water Treatment Plant, expected to be completed before July 2008.

Interconnects & Supply Agreements With Other Utilities:

The city has an interconnects with Belle Glade for limited supply.



LEE COUNTY - OLGA

Utility Contact: Howard Wegis (239) 479-8163 wegishs@leegov.com
SFWMD Coordinator: Nestor Garrido (561) 682-6908 ngarrido@sfwmd.gov
SFWMD Permit Reviewer: Terrance Bengtsson (239) 338-2929 x7740 tbengts@sfwmd.gov

Water Use Permit #: 36-00003-W **Issued:** 05/15/2003 **Expires:** 04/10/2008

Source: Caloosahatchee River (C-43 Canal)

Annual Allocation: 7,749 MG including Corkscrew, Green Meadows and Cypress Lakes Wellfields

Max. Month. Allocation: 941.4 MG

2005 Pumpage: 4.0 MGD AADF

2006 Pumpage: 3.96 MGD AADF

Treatment Facilities:

Number of Facilities: Olga Water Treatment Plant

Total Capacity: 5.0 MGD

Treatment Method: Conventional coagulation, sedimentation and filtration

Supply Sources:

Surface Water from C-43 Canal:

During a severe drought, lack of water being released from Lake Okeechobee and the threat of saline water encroaching eastward through the Franklin locks (S-79) are the two factors affecting water quality at the Olga WTP.

Monitoring Wells:

N/A

Alternative Water Sources:

Aquifer storage and recovery (ASR)

Utility Contingency Plan:

Shut down the Olga WTP intake - This option is not contemplated by Lee County as they need water from the Olga WTP to combat fires that frequently occur during droughts.

Public Notices - In coordination with the Lee County Health Department, public notes are distributed to advise individuals susceptible to higher chloride and sodium levels in their water to monitor their water consumption and health.

Aquifer Storage and Recovery (ASR) System, Olga WTP - This facility can store approximately 40 million gallons, but arsenic levels that exceed the primary drinking water standard may limit its use during any given drought.

Aquifer Storage and Recovery (ASR) System, Corkscrew Wellfield - This facility can store approximately 300 million gallons at 3 MGD, and is located in the southern portion of the county's service area.

Franklin Locks - Request limited opening of the Franklin Locks.

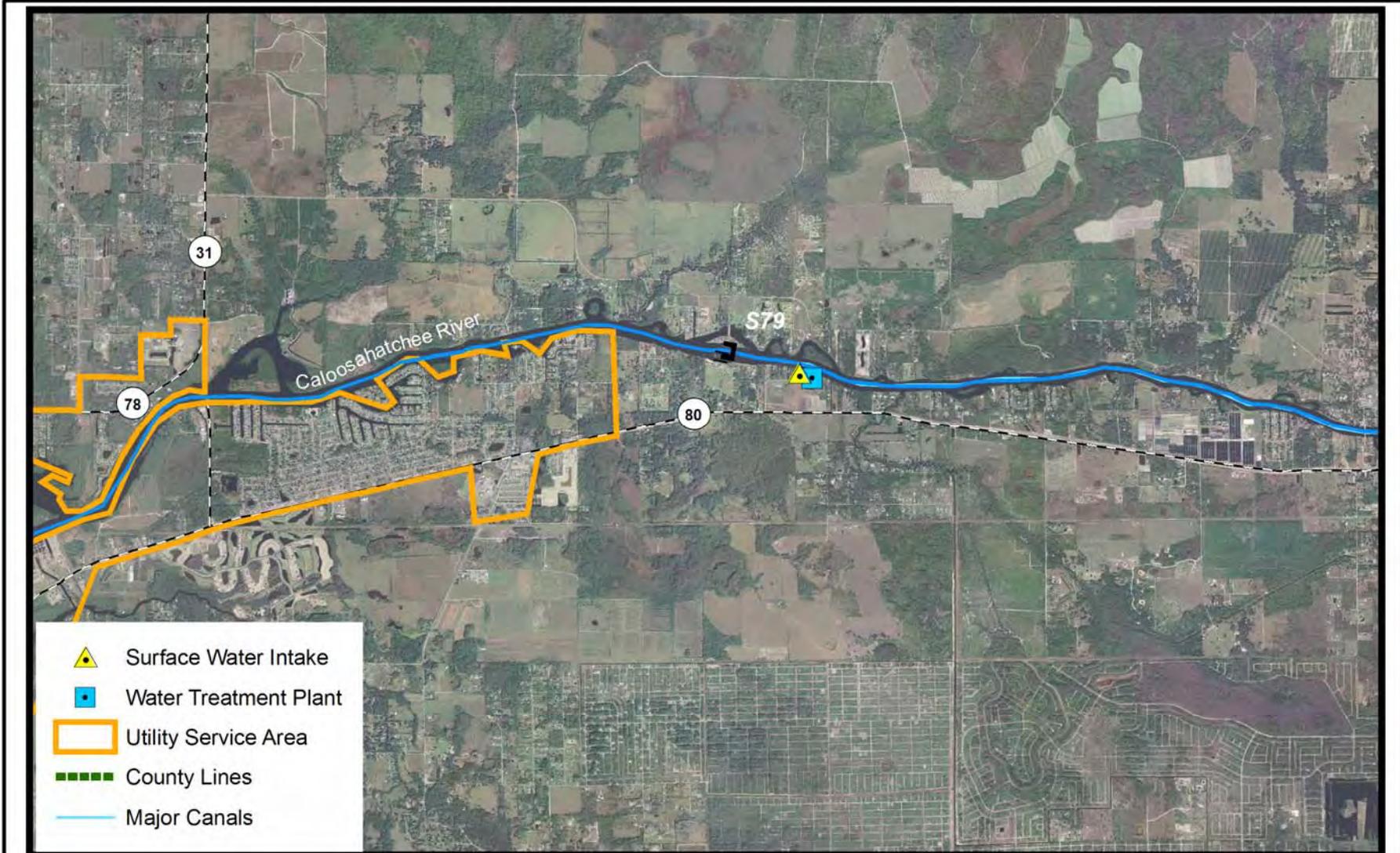
Interconnects & Supply Agreements with Other Utilities:

Lee County has physical interconnects with a few neighboring utilities including:

Bonita Springs - Up to 2 MGD can be delivered, but cannot deliver this water directly to the Olga WTP service area.

Fort Myers - 1 to 2 MGD is possible, but low pressure, low flow, and incompatible disinfection process make this option problematic.

Cape Coral - The existing interconnect is only 6-inch-diameter, which limits flow (< 1 MGD) and since Cape Coral rarely has excess water, is rarely used except to provide water from Lee County to Cape Coral.



-  Surface Water Intake
-  Water Treatment Plant
-  Utility Service Area
-  County Lines
-  Major Canals

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Lee County Utility - Olga

(Prepared 8/30/2007)



U.S. SUGAR CORPORATION - CLEWISTON

Utility Contact: Roy Carter 863-902-2811

SFWMD Coordinator: Jorge Patino (561) 682-6175 jpatino@sfwmd.gov

SFWMD Permit Reviewer: Kevin Rohrer, 561-682-6045, mkrohrer@sfwmd.gov

Water Use Permit #: 26-00024-W Issued: 12/14/2006 Expires: 12/14/2011

Source: Lake Okeechobee, Rim Canal, and Lower Tamiami Aquifer (LTA) - 99% of allocation from the Lake and Rim Canal.

Annual Allocation: 2,106 MG

Max. Month. Allocation: 202.8 MG, LTA limited to 680 MGY and 94.5 MGM

2005 Pumpage: 1,903 MG

2006 Pumpage: 1,670 MG

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 6.0 Potable and 1.0 Process = 7.0 MGD total

Treatment Method: The plant has two treatment trains: Enhance Softening for potable and Enhanced Coagulation for process water.

Supply Sources:

Lower Tamiami Aquifer:

Total Wells: (2) 12" diameter by 155' deep wells

Limitations: LTA limited to 680 MGY and 94.5 MGM and has a rated capacity of 70 MGM

Lake Okeechobee:

Withdrawal Facilities: 4 pumps, 1 intake, 5'x5' opening

Limitations: Rated capacity 534.1 MGM, surface water pumps intake elevation is 5.31' NGVD

Lake Okeechobee Rim Canal:

Withdrawal Facilities: 2 pumps, 2 intakes, 1 intake at Elevation 6.5; 1 intake at Elevation 1.75

Limitations: Rated capacity 429 MGM, intake elevation of 5,000 GPM surface water pump is 6.5' NGVD

Monitoring Wells:

N/A

Alternative Water Sources:

The City of Clewiston has been constructing a 3-MGD reverse osmosis (RO) water treatment plant to treat Upper Floridan Aquifer water. The city indicated in its funding proposal that the plant is expected to be completed by August 1, 2007.

Utility Contingency Plan:

The City of Clewiston currently gets water from U.S. Sugar Corporation's water treatment plant with intakes located in the lake and the Rim Canal. A pump station was installed by the District in 2001 along the Rim Canal, as a result of the 2001 drought to ensure that potable water supply is available to the Clewiston area when lake levels are low. The new water intake can draw water down to about elevation 1.75 feet NGVD. U.S. Sugar water operators reported sediment problems with the rim canal backup intake. The District coordinated with the Army Corps of Engineers and used their barge with the assistance of Field Station crew and dredged the intake back to design sections on May 8, 2007. Cleanout was successful and pumps are presently functional. Due to declared water shortage, water withdrawal reductions have been ordered by the District in accordance with the Water Shortage Plan, Chapter 40E-21, F.A.C., During declared water shortage, permittee shall submit pumpage reports.

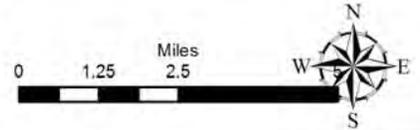
Interconnects & Supply Agreements with other Utilities:

Supplies water as a wholesaler to the City of Clewiston. On August 18, 2003 (see City of Clewiston Permit No. 26-00769-W), U.S. Sugar notified the City of Clewiston and South Shore Water Association that they would stop selling water to them by September 2006. A letter dated November 10, 2005 indicated that U.S. Sugar will supply water to the city until August 2007. Due to delays in completing the RO plant, the City of Clewiston is expected to continue to get water from U.S. Sugar until October/November 2007.



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U.S. Sugar Corporation - Clewiston
 (Prepared 8/30/2007)



WEST PALM BEACH

Utility Contact: Marjie Craig, Utility Director 561-494-1040

SFWMD Coordinator: Ching Garvey (561) 682-2019 cgarvey@sfwmd.gov

SFWMD Permit Reviewer: Steve Memberg (561) 682-2133 smemberg@sfwmd.gov

Water Use Permit #: 06-00615-W Issued: 10/12/2006 Expires: 10/12/2026

Source: Surface Water (water treatment plant intake from Clear Lake). This is a summation of all source contributions including Clear Lake, Surficial Aquifer and Floridan Aquifer.

Annual Allocation: 39.3 MGD

Max. Daily Allocation: 44.6 MGD

2005 Pumpage: 31.51 MGD

2006 Pumpage: 31.73 MGD (Clear Lake surface water) and 5.17 MGD (wellfield Surficial water)

* Limiting Condition #26: Wellfield withdrawals are not authorized until the advanced wastewater treatment at East Central Water Reclamation Plant (ECRWRP) is operational and the reclaimed water is used to recharge the wellfield site. The city is authorized to withdraw water from the wellfield on a one-to-one basis relative to the delivery of ECRWRP reclaimed water to the wellfield.

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 47 MGD for surface water regional system

Treatment Method: Lime softening and chemical coagulation method.

Supply Sources:

Wellfields:

Wellfield: 1 Wellfield (located just East of the Turnpike and the city's wastewater treatment plant)

Total Wells: 10 wells, drilled in 1989

Limitations: Production is based on a one-to-one relative to the delivery of reclaimed water from the wetland based reclamation project. Withdraws from the wellfield are discharged to the M-Canal for treatment at the Clear Lake Water Treatment Plant (WTP).

Aquifer Storage and Recovery (ASR):

1 ASR Well - located at the city's Water Treatment Plant (WTP)

Total Wells: 1 7-MGD well drilled in 1998

Limitations: The total dissolved solids (TDS) are 8,000 mg/L. The usage is limited to the capability of the treatment plant to treat this high TDS. If it's used, it is also depends on the level of dilution it gets from the other water sources. The usage is limited by the water quality, since its source of water is from a shallow zone of the Floridan Aquifer.

Monitoring Wells:

N/A

Alternative Water Sources:

This includes 6 MGD reclaimed water produced at the ECRWRP, which is used to recharge the wellfield located just south of the ECRWRP. Renaissance Urban Stormwater Treatment project produces 1 MGD raw water, and storage of excess seasonal water via ASR.

WEST PALM BEACH

Utility Contingency Plan:

WPB expects to blend additional raw water (20 MGD) from the L-8 Rock Pit Reservoir via M-Canal to the Clear Lake to the WPB downtown water treatment plant. In addition, the ECRWTP will produce 10 MGD reclaimed water (4 MGD additional flow to normal permitted capacity). Six MGD raw water from the M-Canal will be blended with 10 MGD reclaimed water at the pipe to the wellfield located just west of the turnpike and south of the M-Canal. This blended water will recharge the standby wellfield. Therefore, the city may be allowed to pump 16 MGD raw water from the standby wellfield to the M-Canal. Finally, the city may be allowed to pump 30 MGD raw water from the Clear Lake to supply the water treatment plant. This allocation may need temporary permit. Florida Department of Environmental Protection Emergency Orders are required for directing L-8 water to M-Canal and its blending with reclaimed water at pipe to the standby wellfield, issuing variances for the water quality parameters of concerns, and allowing reclaimed water to directly sent to the standby wellfield.

Discussion:

DOH and FDEP agreed on a variation of the original City of West Palm Beach alternative to use advanced treated reuse water to supplement the city's water supply. The new alternative will co-mingle approximately 10 MGD of Public Access Reclaimed Water (from the City of West Palm Beach's ECRWRF Water Reclamation Project Facility) with 6 MGD of surface water from the M Canal. The co-mingled water will be conveyed to the standby wellfield impoundment area and allowed to percolate. This approach will allow the city to direct up to 16 MGD from the standby wellfield to the M-canal. A draft FDEP Emergency Authorization has been circulated by the DEP local office for comments to various interested groups (SFWMD, DOH, West Palm Beach).

The city does not have a plan to use the aquifer storage and recovery (ASR) because of the high TDS (8,000 ppm). If the ASR is used, the city could only withdraw 0.5 MGD. Since the L-8 Rock Pit water will be used, there is no plan to utilize its ASR.

An ordinance to permanently limit landscape irrigation to Phase 3 is started on April 27, 2007.

Interconnects & Supply Agreements With Other Utilities:

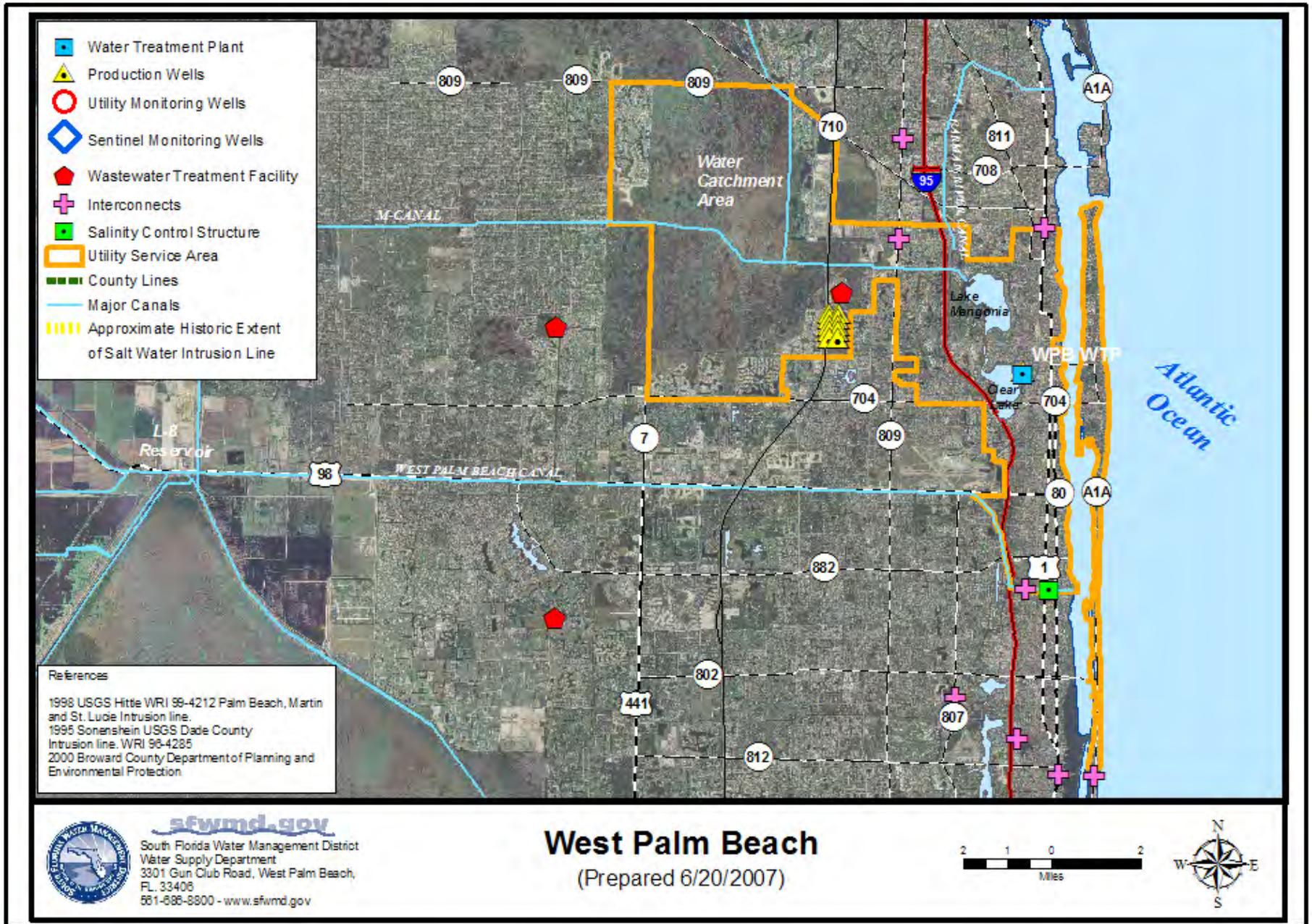
One interconnection with:

- City of Lake Worth delivery of up to 0.05 MGD finished water
- Village of Royal Palm Beach delivery of up to 2 MGD finished water
- Seacoast Utilities delivery up to 3 MGD finished water

Two interconnects with Indian Trail Improvement District delivery up to 0.15 MGD finished water

Two emergency interconnects with City of Riviera Beach

Three emergency interconnects with Palm Beach County



**Utilities of Concern in the
Lower West Coast Region
May 24, 2007**



**Water Shortage Analysis Team
South Florida Water Management District**

CONTACT INFORMATION

For further information about this document, please contact:

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INTRODUCTION

South Florida is experiencing one of the driest times in history. Water levels in the south Florida regional water management system and aquifers are critically low and rainfall is projected to be below normal in the coming months. The C-43 Basin is the only basin in the Lower West Coast Region connected to Lake Okeechobee, which is approaching one of the lowest water levels in recorded history. The remaining portions of this region are dependent on local rainfall for recharge of local and regional canals, and the Surficial Aquifer System (SAS) and Intermediate Aquifer System (IAS). Water levels in many monitoring wells along the coast are reaching all-time lows, and canal levels are nearing levels that prohibit additional withdrawals.

The SAS, which includes the Water Table and Lower Tamiami aquifers, is the principal source of water for urban uses, including potable water. The IAS, which includes the Sandstone and mid-Hawthorn aquifers, is also used for potable supply. In most of the urbanized portion of the region, development of the SAS and IAS has been maximized. As a result, most of the utilities in this region have tapped the Floridan Aquifer System (FAS) and constructed reverse osmosis treatment facilities to supplement SAS withdrawals. The Lee County Olga facility uses water from the C-43 Canal and Marco Island withdraws water from lakes on the mainland. In addition, Cape Coral withdraws water from their vast network of canals to supplement reclaimed water for irrigation.

Many public water supply systems in the Lower West Coast region are dependent on rainfall to recharge wellfields and impede the movement of saltwater inland during dry times. If water levels cannot be maintained in the coastal canals, the potential for inland movement of the saltwater interface increases. Several of the utilities in this region have wellfields located in close proximity to the coast and the existing saltwater interface. Any movement of the saltwater interface could contaminate these wellfields and jeopardize their role as a water supply source.

PURPOSE

The purpose of this document is to provide information about: the utilities that use surface water or have coastal wellfields in the Lower West Coast region; associated treatment facilities; interconnects with other utilities; and, current utility contingency plans, should a water source become unable to support user needs. Contingency plans will be evaluated on a regional basis, and areas where further work is needed will be identified. The utility information in this document was compiled from water use permits, the Lower West Coast Water Supply Plan and communications with the utilities. The utility-specific information was reviewed by the utilities for accuracy and completeness. This document will be amended and updated periodically as needed, especially as updates to contingency plans are provided.

An objective of this effort is to ensure utilities have effective drought contingency plans to address reduced water availability due to inland movement of the saltwater interface

or depleted surface water sources. Contingency plans should include strategies for the worst possible scenarios. While several of the utilities have multiple wellfields that can shift their pumpage to wellfields further west, or have an alternative source of water (i.e., Floridan Aquifer) that can be used to continue to meet user needs, the timing and trigger points to effect these shifts needs to be documented. Utility information and individual maps of these utilities, wellfields, service areas, etc. are provided in the Maps section of this document.

UTILITIES OF CONCERN

The Utilities of Concern in the Lower West Coast region have been divided into two categories: Surface Water Utilities of Concern and Coastal Utilities of Concern.

Surface Water Utilities of Concern

The Lee County Olga facility withdraws water from the C-43 Canal just upstream of the S-79 structure. Salinity levels near the Olga intake are reduced under normal conditions with water deliveries from Lake Okeechobee. At the time of this report, these water deliveries have been suspended. Marco Island Utilities relies on surface water lakes and impoundments for water supply. In addition, Cape Coral withdraws water from their vast network of canals to supplement reclaimed water for irrigation. Without rainfall, the water levels in these surface water sources are considerably lower than normal.

The following utilities have been determined to be Surface Water Utilities of Concern:

- ◆ Lee County Olga
- ◆ Marco Island (Marco Lakes)
- ◆ Cape Coral – IQ System

Coastal Utilities of Concern

Utilities that have wellfields near the saltwater interface, which have a western wellfield, and/or an alternative source that is not threatened by saltwater intrusion are categorized as Coastal Utilities of Concern. The following utilities, in order from north to south, have been determined to be Coastal Utilities of Concern:

- ◆ Bonita Springs Utilities
- ◆ Naples

SENTINEL MONITORING WELL NETWORK

The District has identified over 80 monitoring wells located throughout the District that form the Sentinel Monitoring Well Network. Most of the monitoring wells are owned by the USGS and utilities. The frequency of sampling for these wells has increased to weekly for water levels and chlorides. These data are analyzed to detect the movement and potential for movement of the saltwater interface. These data will principally be provided by utilities required to conduct this monitoring as a condition of their water use permit. Declining water levels and increases in chloride concentrations are indicators that saltwater intrusion is occurring within the aquifer. These observations may lead the South Florida Water Management District (SFWMD or District) to request weekly monitoring from more stations—including utility production wells—to determine the extent of the saltwater intrusion and its impact on the aquifer and potable water quality from the affected utility.

SUMMARY

This assessment reflects the utilities' ability to support water supplies during prolonged drought conditions by using interconnects and other contingency planning. While contingency planning should occur at both the local utility and regional levels, in fact, very few of the utilities have formal written plans for conditions that affect their water supply source.

For those utilities of concern that have no interconnects or ability to move pumpage to western wellfields, a more stringent monitoring program is needed. Saltwater monitoring and weekly pumpage reporting will be used to assess conditions as the drought persists.

For those utilities that have interconnects, several problems have been highlighted. First, the wellfields that are of concern are located in the eastern areas and have limited ability to shift wellfields to the west. Often, these utilities have interconnects with adjoining utilities that are under the same constraints. Since formal agreements between utilities are generally lacking, most are on an as-needed, as-available basis. With increased demands for water during this extremely dry period, many of the utilities are maximizing their water production to meet their own user demands, and do not have water to support other utilities.

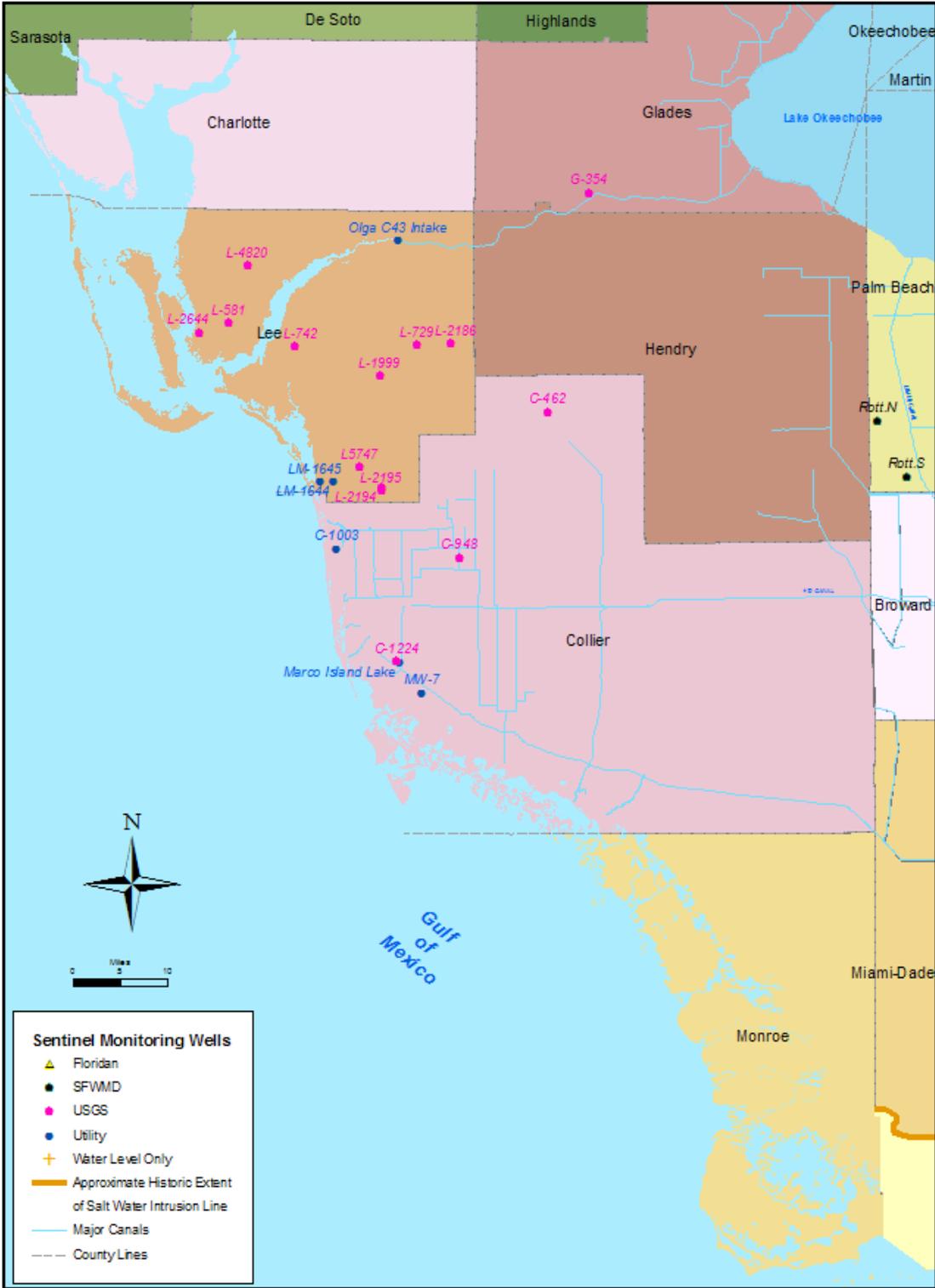
Second, these interconnects are at the extremities of the water distribution systems and have limited ability to convey large volumes of water from one utility to the other. In addition, the ability to convey water from one utility to another is constrained by the pressure differences between the utilities' systems. The receiving utility has to have lower line pressure before the utility providing the water can make any water distribution. It appears that most utilities are relying on an ad-hoc approach to this situation rather than a formalized contingency plan.

Third, the precise location of interconnects in several instances is unknown. Some have detailed maps that may or may not be part of their consumptive use permit. However, this information, if available, is dated or incorrect.

Coastal utilities of concern have western wellfields or have developed an alternative water supply that should provide some opportunity for contingencies. For example, many have shifted their pumpage, as much as possible, to their western wellfield or have expanded their alternative water supply, reducing pumpage along the coast, thus reducing the potential for saltwater intrusion. However, these operational decisions appear to be informal, rather than documented in contingency plans.

This document will be amended and updated periodically as needed, especially as updates to contingency plans are provided.

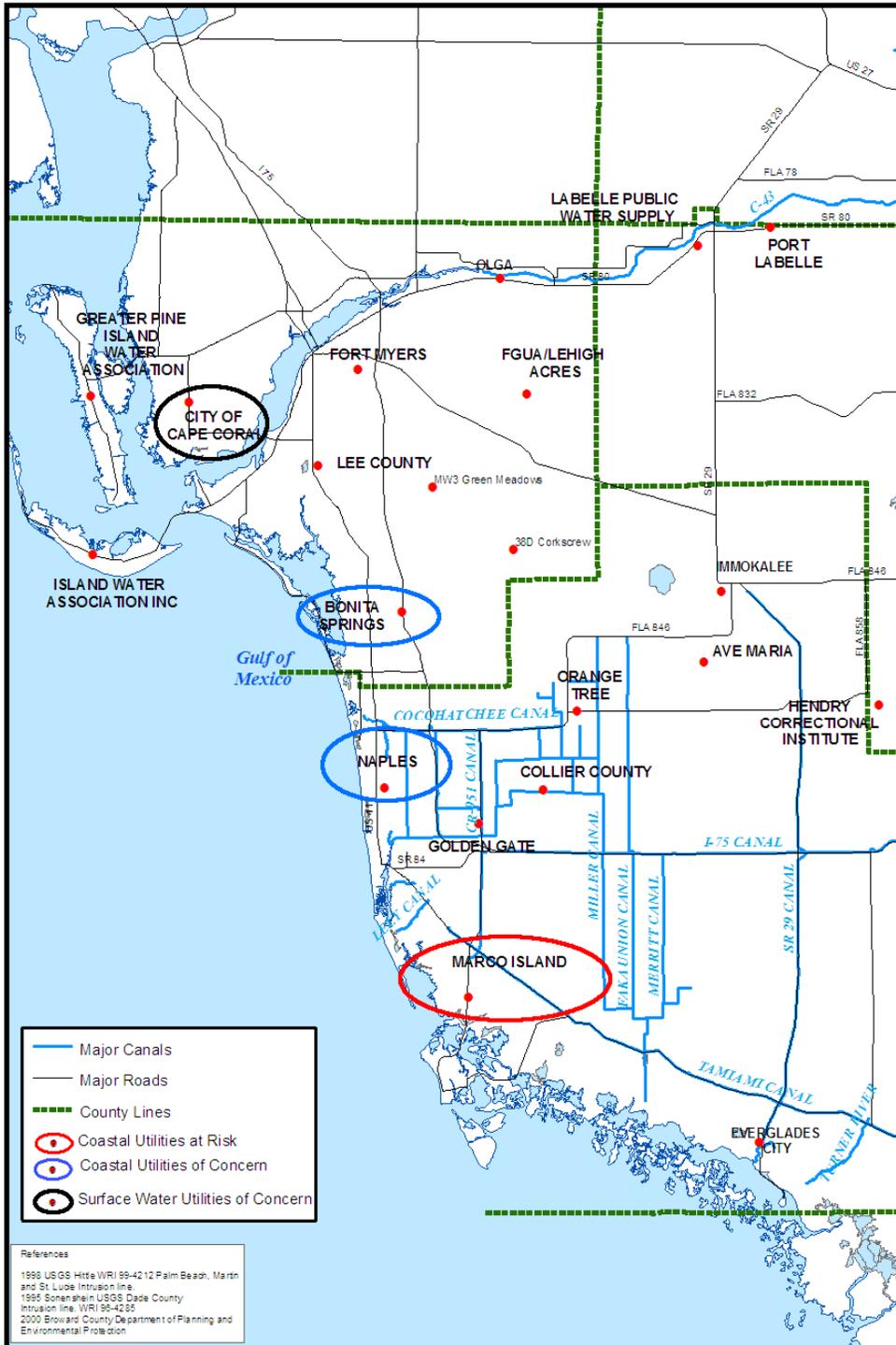
**MAPS OF
SENTINEL MONITORING WELL NETWORK,
SURFACE WATER UTILITIES OF CONCERN
AND
COASTAL UTILITIES OF CONCERN**



**Sentinel Monitoring Wells in
Lower West Coast Region**
(Prepared 5/21/2007)

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Utilities of Concern Lower West Coast



- Major Canals
- Major Roads
- - - County Lines
- Coastal Utilities at Risk
- Coastal Utilities of Concern
- Surface Water Utilities of Concern

References
 1996 USGS Htde WRI 99-4212 Palm Beach, Martin and St. Lucie Intrusion line
 1995 Sonenshein USGS Dade County Intrusion line, WRI 99-4235
 2000 Broward County Department of Planning and Environmental Protection



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(Prepared 5/18/2007)



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**SURFACE WATER UTILITIES OF CONCERN:
UTILITY SUMMARIES AND WELLFIELD MAPS**

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LEE COUNTY - OLGA PUBLIC WATER SUPPLY

Utility Contact: Howard Wegis (239) 479-8163 wegishs@leegov.com
SFWMD Utility Coordinator: Nestor Garrido (561) 682-6908 ngarrido@sfwmd.gov
SFWMD Permit Reviewer: Terrance Bengtsson (239) 338-2929 x7740 tbengts@sfwmd.gov

Water Use Permit #: 36-00003-W **Issued:** 05/15/2003 **Expires:** 04/10/2008

Source: Caloosahatchee River

Annual Allocation: 7,749 MG that includes Corkscrew, Green Meadows and Cypress Lakes Wellfields

Max. Month. Allocation: 941.4 MG

2005 Pumpage: 4.00 MGD AADF

2006 Pumpage: 3.96 MGD AADF

Treatment Facilities:

Number of Facilities: Olga Water Treatment Plant

Total Capacity: 5.0 MGD (Treatment capacity)

Treatment Method: Conventional coagulation, sedimentation and filtration

Supply Sources:

Source: C-43 Canal

Limitations: During a severe drought, lack of water being released from Lake Okeechobee and the threat of saline water encroaching eastward through the Franklin locks (S-79) are the two factors affecting water quality at the Olga WTP.

Monitoring Wells:

None

Alternative Water Sources:

Aquifer storage and recovery (ASR)

Utility Contingency Plan:

Shut down the Olga WTP intake - This option is not contemplated by Lee County as they need water from the Olga WTP to combat fires that frequently occur during droughts.

Public Notices - In coordination with the Lee County Health Department, public notes are distributed to advise individuals susceptible to higher chloride and sodium levels in their water to monitor their water consumption and health.

Aquifer Storage and Recovery (ASR) System, Olga WTP - This facility can store approximately 40 MG, but arsenic levels that exceed the primary drinking water standard may limit its use during any given drought.

Aquifer Storage and Recovery (ASR) System, Corkscrew Wellfield - This facility can store approximately 300 MG at 3 MGD, and is located in the southern portion of the County's service area.

Franklin Locks- Request limited opening of the Franklin Locks

Interconnects & Supply Agreements with Other Utilities:

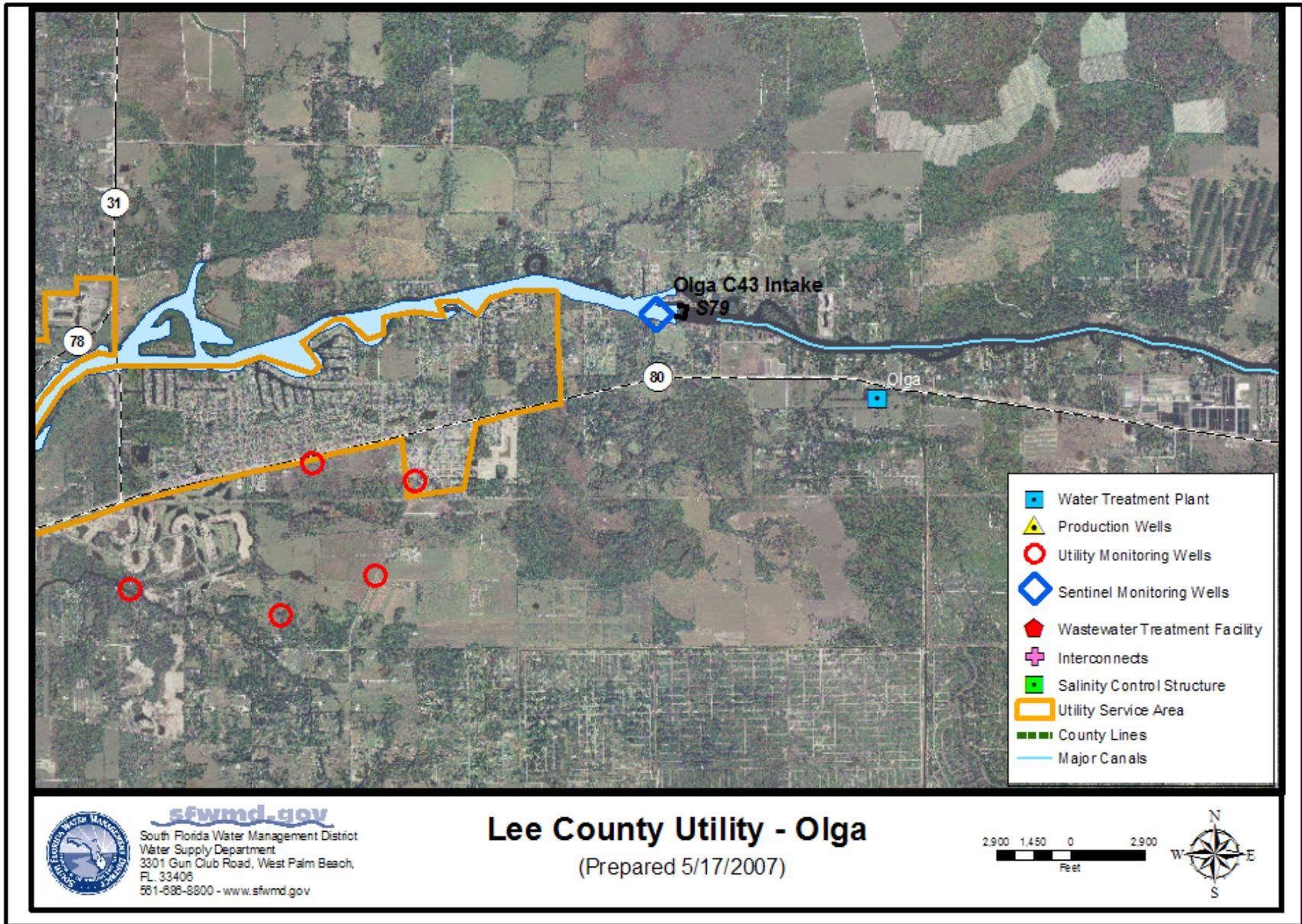
Lee County has physical interconnects with a few neighboring utilities including:

Bonita Springs - Up to 2 MGD can be delivered, but cannot deliver this water directly to the Olga WTP service area.

Fort Myers - 1 to 2 MGD is possible, but low pressure, low flow, and incompatible disinfection process make this option problematic.

Cape Coral - The existing interconnect is only 6-inch-diameter, which limits flow (< 1 MGD) and since Cape Coral rarely has excess water, is rarely used except to provide water from Lee County to Cape Coral.

Lee County has interconnects between all of its water plants' service areas. Essentially, there is one big service area served by Olga, Corkscrew, New North Lee County, Green Meadows, Cypress Lakes (off line now), Waterway Estates, Pinewoods (old GES Corkscrew) and Bartow/San Carlos (currently offline). There are projects planned to more efficiently move water throughout the entire system, currently this is difficult in high demand times. Lee County also has emergency interconnects with Bonita Springs Utilities, City of Fort Myers, and City of Cape Coral.



CAPE CORAL - SUPPLEMENTAL CANAL WATER

Utility Contact: George Reilly (239) 574-0710 greilly@capecoral.net
SFWMD Utility Coordinator: Nestor Garrido (561) 682-6908 ngarrido@sfwmd.gov
SFWMD Permit Reviewer: Terrance Bengtsson (239) 338-2929 x7740 tbengts@sfwmd.gov

Water Use Permit #: 36-00998-W Issued: 10/14/1993 Expired: 06/30/2005 **Renewal in-house?**

Source: Horizontal wells in the water table aquifer and freshwater canal system

Annual Allocation: 11622 MG
Max. Month. Allocation: 1409.4 MG
2005 Pumpage: 10.6 MGD AADF
2006 Pumpage: 10.7 MGD AADF

Treatment Facilities:

Number of Facilities: 2 Water reclamation plants, 5 canal stations
Total Capacity: 6.6 MGD Southwest WRF, 8.5 MGD Everest WRF, 2MGD from wells (17.1 MGD)
Treatment Method: Water reclamation reuse and canal water

Supply Sources:

Water Table Aquifer
Cape Coral Freshwater Canal System: 11622 MG- using 23 pumps

Monitoring Wells:

The city has 25 surface water level monitoring stations.

Alternative Water Sources:

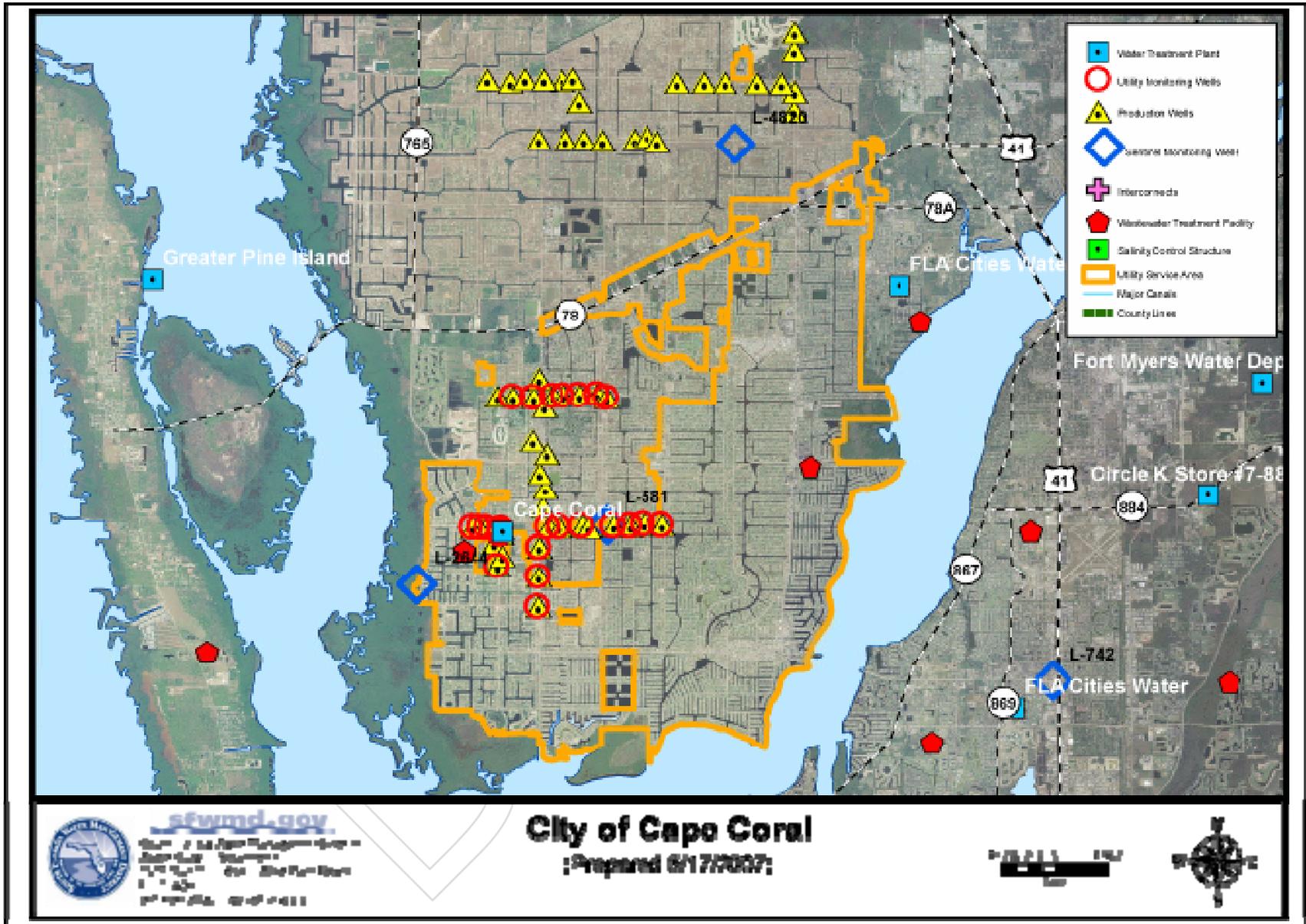
The City of Cape Coral has planned the construction of reclaimed water aquifer storage and recharge (AWS) wells as part of their comprehensive reclaimed water system to store unused reclaimed water during periods of excess water (rainy season). The city installed 34,500 linear feet of reclaimed water distribution line in the southwest area in 2006 and is installing over 200,000 linear feet in 2007. The city is expanding the Everest Water Reclamation Facility including one 5-million gallon reclaimed water storage tank. Also, the Southwest Water Reclamation Facility is being expanded in 2007, which includes two 5-million gallon reclaimed water storage tanks, reject piping and two aeration basins.

Utility Contingency Plan:

The plan includes the possibility of reducing irrigation periods (time of irrigation) within the service area as needed.

Interconnects & Supply Agreements with Other Utilities:

The City has two water interconnects with Lee County Utilities, one water interconnect with Pine Island Water and receives reuse water from Lee County from the Waterway Estates Wastewater Plant.



CITY OF MARCO ISLAND (MARCO LAKES)

Utility Contact: Rony Joel (239) 389-5064 rjoel@cityofmarcoisland.com

SFWMD Coordinator: John Maxted (561) 682-6778 jmaxted@sfwmd.gov

SFWMD Permit Reviewer: Paulette Glebocki (561) 682-6941 pglebocki@sfwmd.gov

Water Use Permit #: 11-00080-W Issued: 02/08/06 Expires: 02/08/2016

Annual Allocation: 4,535 MG (12.42 MGD); source - permit

Max. Month. Allocation: 381 MG; source - permit

2005 Pumpage: 5.68 MGD (2,075 MGY); source - K. Guerrero (regulation)

2006 Pumpage: 5.14 MGD (1,875 MGY); source - K. Guerrero (regulation)

Treatment Facilities:

Number of Facilities: 2 (Marco Island and Marco Shores)

Total Capacity: 7.42 MGD

Treatment Method: Lime softening

Supply Sources:

Wellfields: 2

Floridan Aquifer ASR and Marco Lakes System

Total Wells: 6

Limitations: 6 ASR wells used to supplement surface water in Marco Lakes; Marco lakes providing 2/3 of the water supply for the City

Mid-Hawthorne System

Total Wells: 21

Limitations: These wells linked to RO facility and provide 1/3 water supply for the City.

Monitoring Wells:

All production and ASR well monitored; only Marco Lakes reported (chlorides and conductivity) on the web site.

Alternative Water Sources:

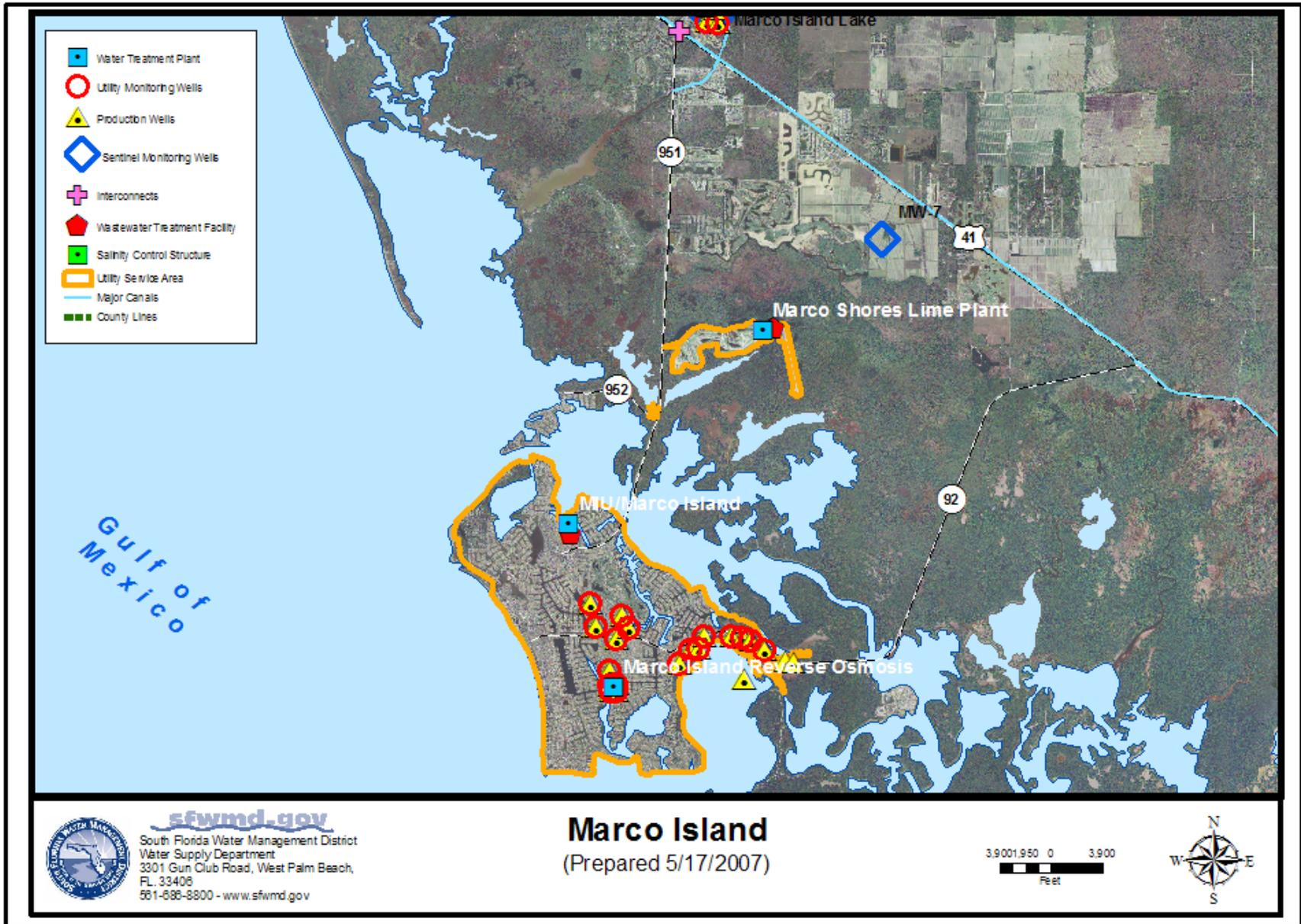
Reclaimed Water Projects: In the early 1980s, Marco Island Utilities started sending treated wastewater to the Marco Island and Marco Shores golf courses. In the late 1990s, the reclaimed service area was expanded to include many condominiums and a 9-hole executive golf course. Currently, the utility is looking to expand the reclaimed system to include another 72 customers that have an estimated usage of 330,000 gallons per day. This will bring their reclaimed usage to approximately 1.8 MGD. The utility also has six ASR wells on-line with a seventh well currently under construction. At the end of the injection cycle, the utility estimates over 700 million gallons injected for 2007 use. Marco Island Utilities also uses a reverse osmosis (RO) water treatment plant. This RO plant is able to treat 6 MGD from 21 different groundwater wells located throughout the island. The utility can also buy water from Collier County Utilities through a 12" interconnect. This interconnect could provide approximately 3 MGD.

Utility Contingency Plan:

Marco Island Utilities would first start withdrawing from the ASR system to supplement the surface water system. Then the utility would divert most of the demand from the surface water system to the groundwater system. The utility would then purchase bulk water from Collier County.

Interconnects & Supply Agreements with other Utilities:

Interconnect with Collier County Utilities established, but has never been used.



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COASTAL UTILITIES OF CONCERN:
UTILITY SUMMARIES AND WELLFIELD MAPS

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BONITA SPRINGS UTILITIES

Utility Contact: Michael Liggins (239) 390-4834 MLiggins@bsu.us
SFWMD Utility Coordinator: Nestor Garrido (561) 682-6908 ngarrido@sfwmd.gov
SFWMD Permit Reviewer: Terrance Bengtsson (239) 338-2929 x7740 tbengts@sfwmd.gov

Water Use Permit #: 36-00008-W Issued: 11/15/2001 Expired: 11/15/2006

Source: Lower Hawthorn Aquifer, Lower Tamiami Aquifer

Annual Allocation: 2,094 MG (5.73 MGD)

Max. Month. Allocation: 240.3 MG

2005 Pumpage: 3.2 MGD AADF (1,174.3 MG)

2006 Pumpage: 4.2 MGD AADF (1,559.1 MG)

Treatment Facilities:

Number of Facilities: 6.25 MGD - Reverse osmosis

8.00 MGD - Lime softening

Total Capacity: 8.01 MGD

Treatment Method: Lime Softening, filtration and disinfection, and reverse osmosis

Supply Sources:

Wellfields: 2 - East Wellfield and West Wellfield

East Wellfield

Total Wells: 12 wells - Well #5 through Well #16

Limitations: West - 3.18 MGD

West Wellfield

Total Wells: 8 wells - Well #17 through Well #24

Limitations: East - 4.83 MGD

Monitoring Wells:

Monitoring wells MW-1 through MW-8, Bonita-1, Bonita-2, BirdHab, E1, E2, EB, W1 and WB.

Alternative Water Sources:

Bonita Springs Utilities has a Reverse Osmosis water treatment plant with a capacity of 6.6 MGD and an average flow of 5.35 MGD. Refer to permit WUP # 36-04062-W.

Utility Contingency Plan:

Bonita Springs Utilities has developed an Emergency Operations Plan that includes the activation of interconnects with Lee County.

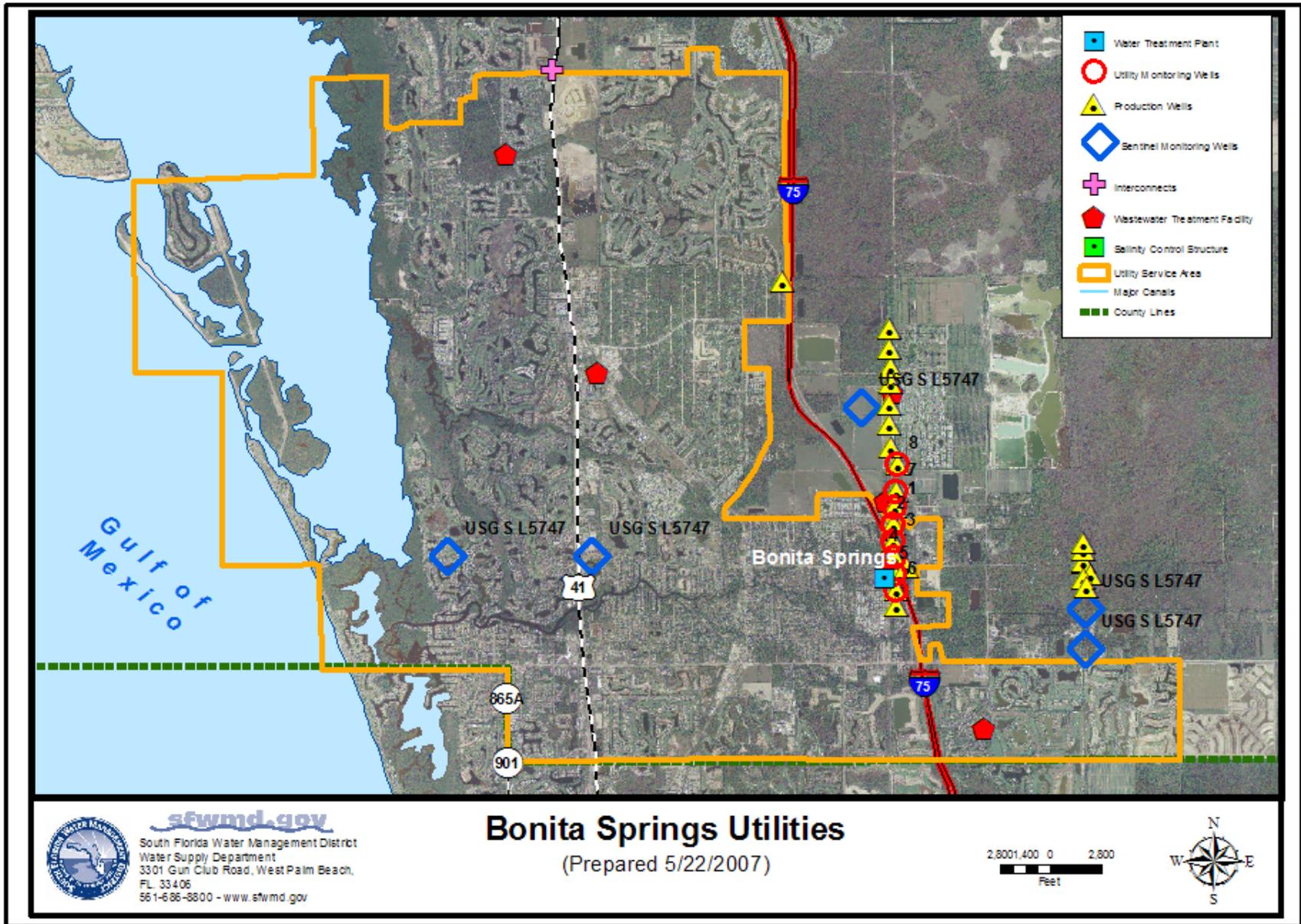
Interconnects & Supply Agreements with Other Utilities:

Two-way Interconnect with Lee County Utilities.

Sales to Lee Co. 2005 = 290.856 MG or MGD AADF 0.80MG.

Sales to Lee Co. 2006 = 395.902 MG or MGD AADF 1.08MG.

One-way Interconnect from Collier County is completed.



CITY OF NAPLES

Utility Contact: Robert Middleton (239) 213-4714 bmiddleton@naplesgov.com

SFWMD Coordinator: John Maxted (561) 682-6778 jmaxted@sfwmd.gov

SFWMD Permit Reviewer: Terry Bengtsson (239) 338-2929 x7740 tbengts@sfwmd.gov

Water Use Permit #: 11-00017-W Issued: 06/12/03 Expires: 06/12/08

Annual Allocation: 6,724 MG (18.42 MGD)

Max. Month. Allocation: 685.3 MG

2005 Pumpage: 16.79 MGD (6,130 MGY)

2006 Pumpage: 18.02 MGD (6,579 MGY)

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 30 MGD

Treatment Method: Lime softening with filtration prior to chlorination and fluoridation

Supply Sources:

Wellfields: 2 - Coastal Ridge - Lower Tamiami Aquifer; East Golden Gate - Surficial Aquifer System

Coastal Ridge - Lower Tamiami Aquifer:

Total Wells: 40

Limitations: 2 abandoned, 12 planned to be plugged and abandoned

East Golden Gate - Surficial Aquifer System:

Total Wells: 23

Limitations: 2 new Surficial Aquifer wells proposed

Monitoring Wells:

Limiting Conditions #26 and #27 in water use permit indicate the monitoring wells and test schedule. They are: Golden Gate MW-3D and S, 14D and S, 21D and S, 25D and 25S. Coastal Ridge C-1003, C528, C491, C490, MW-2D and S, 11D and S, 18D and S, 23D and S, 28D and S.

Alternative Water Sources:

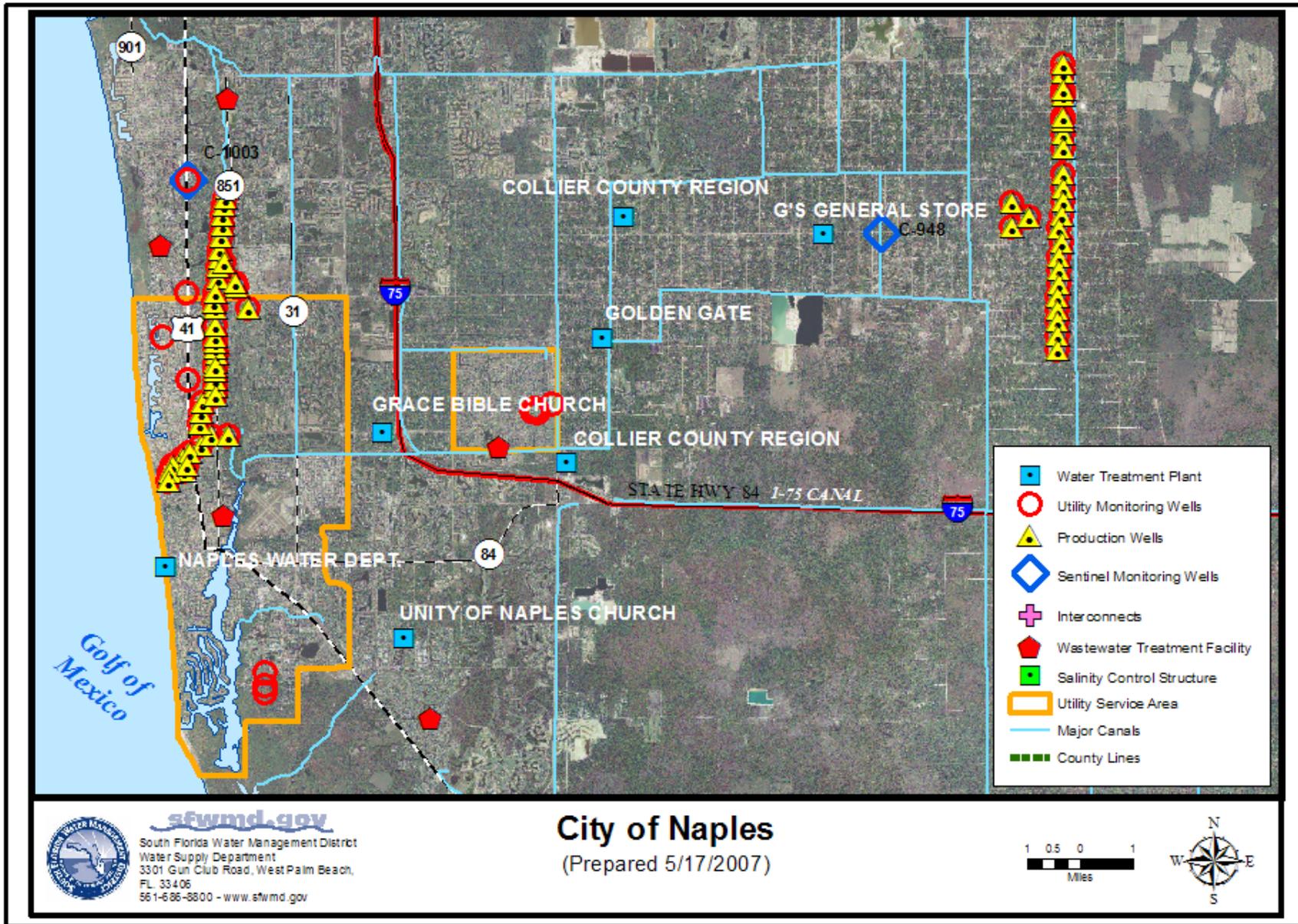
Reclaimed Water Projects: In 1985, the City began operation of a reclaimed water distribution system with nine local golf courses as the primary customers. The golf courses converted from Lower Tamiami water wells to the reclaimed water system reducing the demand on that aquifer. The system has expanded to additional non-resident customers. The current expansion includes a two-phase expansion to approximately 1,000 residential customers south of Central Avenue. Phase III will include an additional 1,000 residential customers. These residential customers currently use potable water for irrigation. The first two phases will save between 2.0 and 4.0 MGD of potable water. This expansion will be completed by August 2007. The City is installing an Exploratory ASR well to determine adequate ASR zones to construct an actual ASR well that will store excess reclaimed water and water from the Golden Gate Canal. This water will be used to supplement the reclaimed water system. An operational ASR well is scheduled by early 2009.

Utility Contingency Plan:

The City has two wellfields, Coastal Ridge wellfield and the East Golden Gate wellfield. The primary wellfield is East Golden Gate. The WUP includes a wellfield management plan based on monitoring well data. During times of drought, pumping is shifted from the Coastal Ridge wellfield to the East Golden Gate wellfield to protect from salt-water intrusion.

Interconnects & Supply Agreements with other Utilities:

The City has an Interconnect agreement with Collier County Utilities that provides two potable water interconnects. They are located at Pine Ridge Rd and Goodlette Rd. The second interconnect is located at Davis Blvd and Lake Wood Dr. These interconnects are used for emergency purposes only.



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**Utilities of Concern in the
Upper East Coast Region
May 24, 2007**



**Water Shortage Analysis Team
South Florida Water Management District**

CONTACT INFORMATION

For further information about this document,
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or

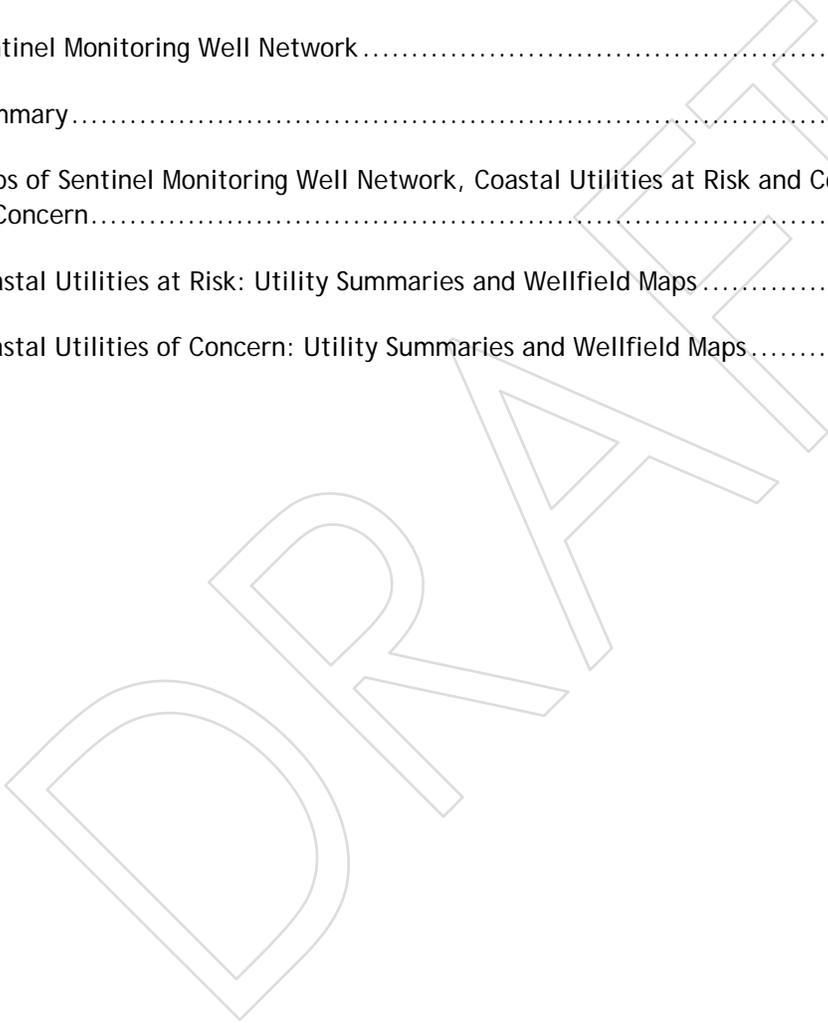
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sfwmd.gov

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INTRODUCTION

South Florida is experiencing one of the driest times in history. Water levels in the south Florida regional water management system and aquifers are critically low and rainfall is projected to be below normal in the coming months. The C-44 Basin is the only basin in the Upper East Coast region connected to Lake Okeechobee, which is approaching one of the lowest water levels in recorded history. The remaining portions of this region are dependent on local rainfall for recharge of local and regional canals, and the Surficial Aquifer System (SAS). Water levels in many monitoring wells along the coast are reaching all-time lows, and canal levels are nearing levels that prohibit additional withdrawals.

The SAS is the principal source of water for urban uses, including potable water. In most of the urbanized portion of the region, development of the SAS has been maximized. As a result, most of the utilities in this region have tapped the Floridan Aquifer System (FAS) and constructed reverse osmosis treatment facilities to supplement SAS withdrawals. In addition to use by utilities, the FAS is an important source of agricultural irrigation water in the northern portion of the region when surface water availability is reduced due to lack of rainfall.

Many coastal public water supply systems in the Upper East Coast region are dependent on rainfall to recharge SAS wellfields and impede the movement of saltwater inland during dry times. If water levels cannot be maintained in the aquifer, the potential for inland movement of the saltwater interface increases. Several of the utilities in this region have wellfields located in close proximity to the coast and the existing saltwater interface. Any movement of the saltwater interface could contaminate these wellfields and jeopardize their role as a water supply source.

PURPOSE

The purpose of this document is to provide information about: the utilities that have coastal wellfields in the Upper East Coast region; associated treatment facilities; interconnects with other utilities; and, current utility contingency plans, should a water source become unable to support user needs. Contingency plans will be evaluated on a regional basis, and areas where further work is needed will be identified. The utility information in this document was compiled from water use permits, the Upper East Coast Water Supply Plan and communications with the utilities. The utility-specific information was reviewed by the utilities for accuracy and completeness. This document will be amended and updated periodically as needed.

An objective of this effort is to ensure utilities have effective drought contingency plans to address reduced water availability due to inland movement of the saltwater interface or depleted surface water sources. Contingency plans should include strategies for the worst possible scenarios. While several of the utilities have multiple wellfields that can shift their pumpage to wellfields further west, or have an alternative source of water (i.e.,

Floridan Aquifer) that can be used to continue to meet user needs, the timing and trigger points to effect these shifts needs to be documented. Utility information and individual maps of these utilities, wellfields, service areas, etc. are provided in the Maps section of this document.

UTILITIES OF CONCERN

The Utilities of Concern in the Upper East Coast region have been divided into two categories: Coastal Utilities at Risk and Coastal Utilities of Concern.

Coastal Utilities at Risk

Coastal Utilities at Risk include utilities with wellfields near the saltwater interface, which do not have a western wellfield, have not developed alternative sources of water, and have limited ability to meet user needs through interconnects with other utilities. The following utilities have been determined to be Coastal Utilities at Risk:

- ◆ Stuart
- ◆ Miles Grant

Coastal Utilities of Concern

Utilities that have wellfields near the saltwater interface, which have a western wellfield, and/or an alternative source that is not threatened by saltwater intrusion are categorized as Coastal Utilities of Concern. The following utilities have been determined to be Coastal Utilities of Concern:

- ◆ Fort Pierce Utilities Authority
- ◆ Martin County North
- ◆ South Martin Regional

SENTINEL MONITORING WELL NETWORK

The District has identified over 80 monitoring wells located throughout the District that form the Sentinel Monitoring Well Network. Most of the monitoring wells are owned by the USGS and utilities. The frequency of sampling for these wells has increased to weekly for water levels and chlorides. These data are analyzed to detect the movement and potential for movement of the saltwater interface. These data will principally be provided by utilities required to conduct this monitoring as a condition of their water use permit. Declining water levels and increases in chloride concentrations are indicators that saltwater intrusion is occurring within the aquifer. These observations may lead the South Florida Water Management District (SFWMD or District) to request weekly monitoring from more stations—including utility production wells—to determine the extent of the saltwater intrusion and its impact on the aquifer and potable water quality from the affected utility.

SUMMARY

This assessment reflects the utilities' ability to support water supplies during prolonged drought conditions by using interconnects and other contingency planning. While contingency planning should occur at both the local utility and regional levels, in fact, very few of the utilities have formal written plans for conditions that affect their water supply source.

For those utilities at risk that have no interconnects or ability to move pumpage to western wellfields, a more stringent monitoring program is needed. Saltwater monitoring and weekly pumpage reporting will be used to assess conditions as the drought persists.

For those utilities that have interconnects, several problems have been highlighted. First, the wellfields that are at risk are located in the eastern areas and have limited ability to shift wellfields to the west. Often, these utilities have interconnects with adjoining utilities that are under the same constraints. Since formal agreements between utilities are generally lacking, most are on an as-needed, as-available basis. With increased demands for water during this extremely dry period, many of the utilities are maximizing their water production to meet their own user demands, and do not have water to support other utilities.

Second, these interconnects are at the extremities of the water distribution systems and have limited ability to convey large volumes of water from one utility to the other. In addition, the ability to convey water from one utility to another is constrained by the pressure differences between the utilities' systems. The receiving utility has to have lower line pressure before the utility providing the water can make any water distribution. It appears that most utilities are relying on an ad-hoc approach to this situation rather than a formalized contingency plan.

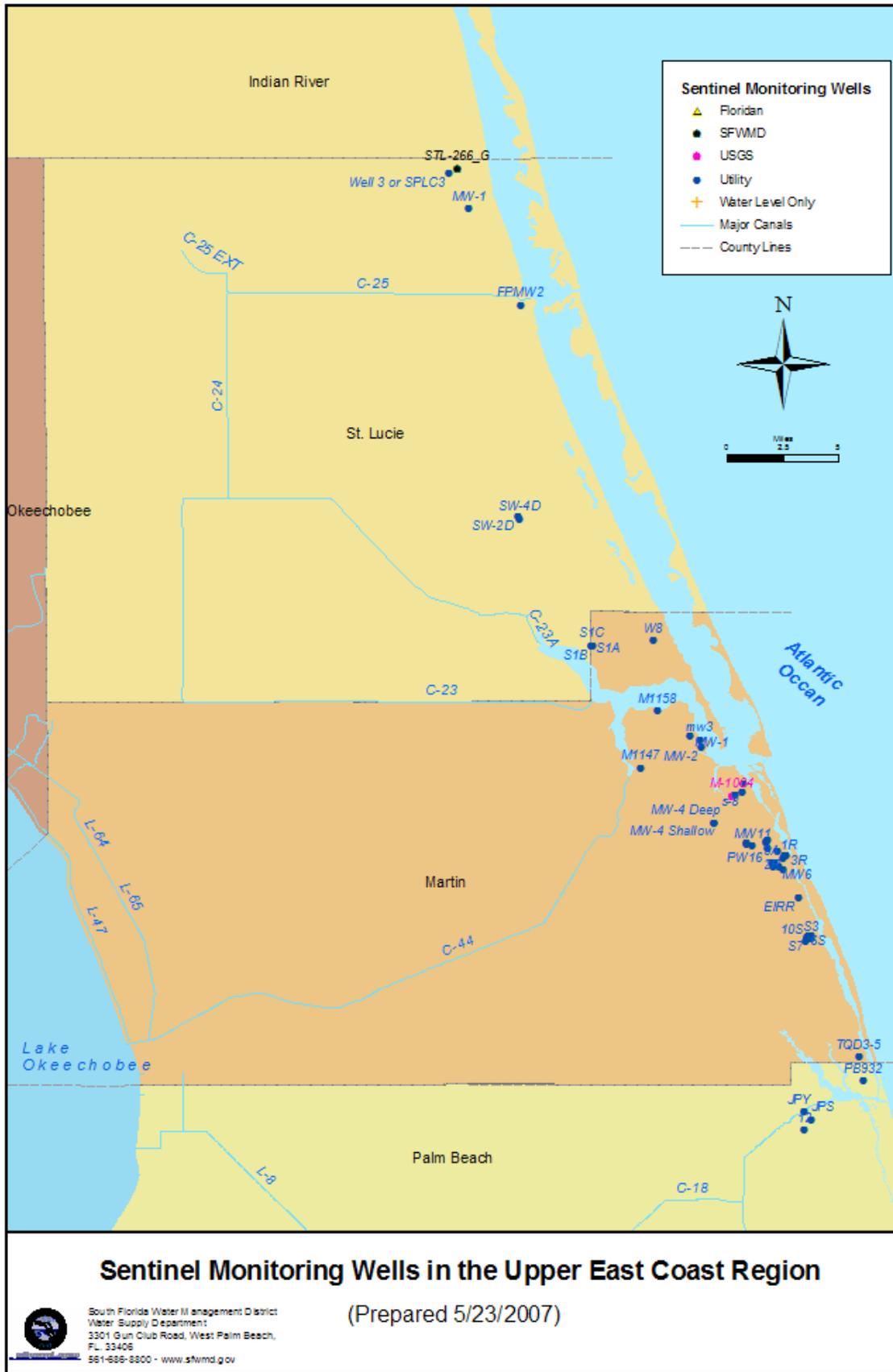
Third, the precise location of interconnects in several instances is unknown. Some have detailed maps that may or may not be part of their consumptive use permit. However, this information, if available, is dated or incorrect.

Coastal utilities of concern have western wellfields or have developed an alternative water supply that should provide some opportunity for contingencies. For example, many have shifted their pumpage, as much as possible, to their western wellfield or have expanded their alternative water supply, reducing pumpage along the coast, thus reducing the potential for saltwater intrusion. However, these operational decisions appear to be informal, rather than documented in contingency plans.

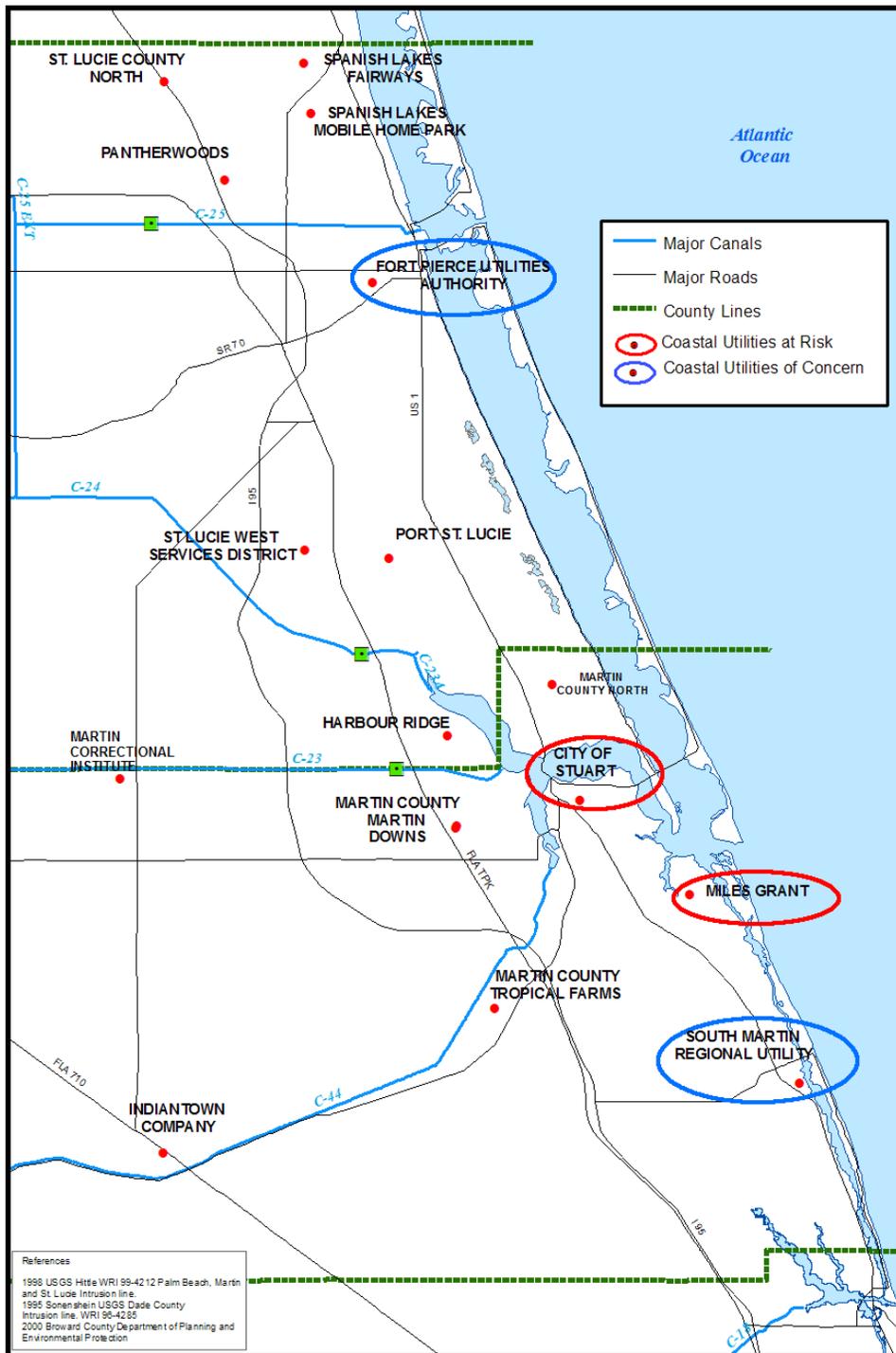
This document will be amended and updated periodically as needed, especially as updates to contingency plans are provided.

MAPS OF
SENTINEL MONITORING WELL NETWORK,
COASTAL UTILITIES AT RISK AND
COASTAL UTILITIES OF CONCERN

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Utilities of Concern Upper East Coast



References
 1998 USGS Hittie WRI 89-4212 Palm Beach, Martin and St. Lucie Intrusion line.
 1995 Sonnenstein USGS Dade County Intrusion line, WRI 96-4235
 2000 Broward County Department of Planning and Environmental Protection



sfwmd.gov
 South Florida Water Management District
 Water Supply Department
 3301 Gun Club Road, West Palm Beach,
 FL 33406
 561-686-8800 - www.sfwmd.gov

(Prepared 5/23/2007)



COASTAL UTILITIES AT RISK:
UTILITY SUMMARIES AND WELLFIELD MAPS

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STUART UTILITIES

Utility Contact: Mary Kindel (772) 288-1292 ext. 2 mkindel@ci.stuart.fl.us

SFWMD Coordinator: Nestor Garrido (561) 682-6908 ngarrido@sfwmd.gov

SFWMD Permit Reviewer: Jeff Scott (561)682-6924 jscott@sfwmd.gov

Water Use Permit #: 43-00053-W Issued: 05/10/2001 Expired: 05/10/2006 Application in-house

Annual Allocation: 1,087 MG (2.98 MGD)

Max. Month. Allocation: 137.8 MG

2005 Pumpage: 843 MGY (2.31 MGD) North Well Field
138 MGY (0.38 MGD) South Well Field

2006 Pumpage: 857 MGY (2.35 MGD) North Well Field
288 MGY (0.79 MGD) South Well Field

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 9.81 MGD

Treatment Method: One lime softening plant

Supply Sources:

Wellfields: 30 Surficial wells

North Well Field

Total Wells: 15 (Production wells 1 through 15)

Limitations: Production well 16 through 21 are under the control of Vought Permit #43-00675-W

South Well Field

Total Wells: 9 (Production wells 22 through 30)

Limitations:

Monitoring Wells:

The SALT program consists of the monthly collection of water level data from 20 monitoring wells (M147, M1010, M1011, M1055, M10190, M1091, M1132, M1141, M1146, M1147, M1150, M1156, M1157, M1158, M1161, M1163, M1165, M1168, M1179, and M1183). Monthly chloride data is submitted for 9 of those wells (M1011, M1090, M1132, M1141, M1146, M1147, M1158 and M1165).

Alternative Water Sources:

None

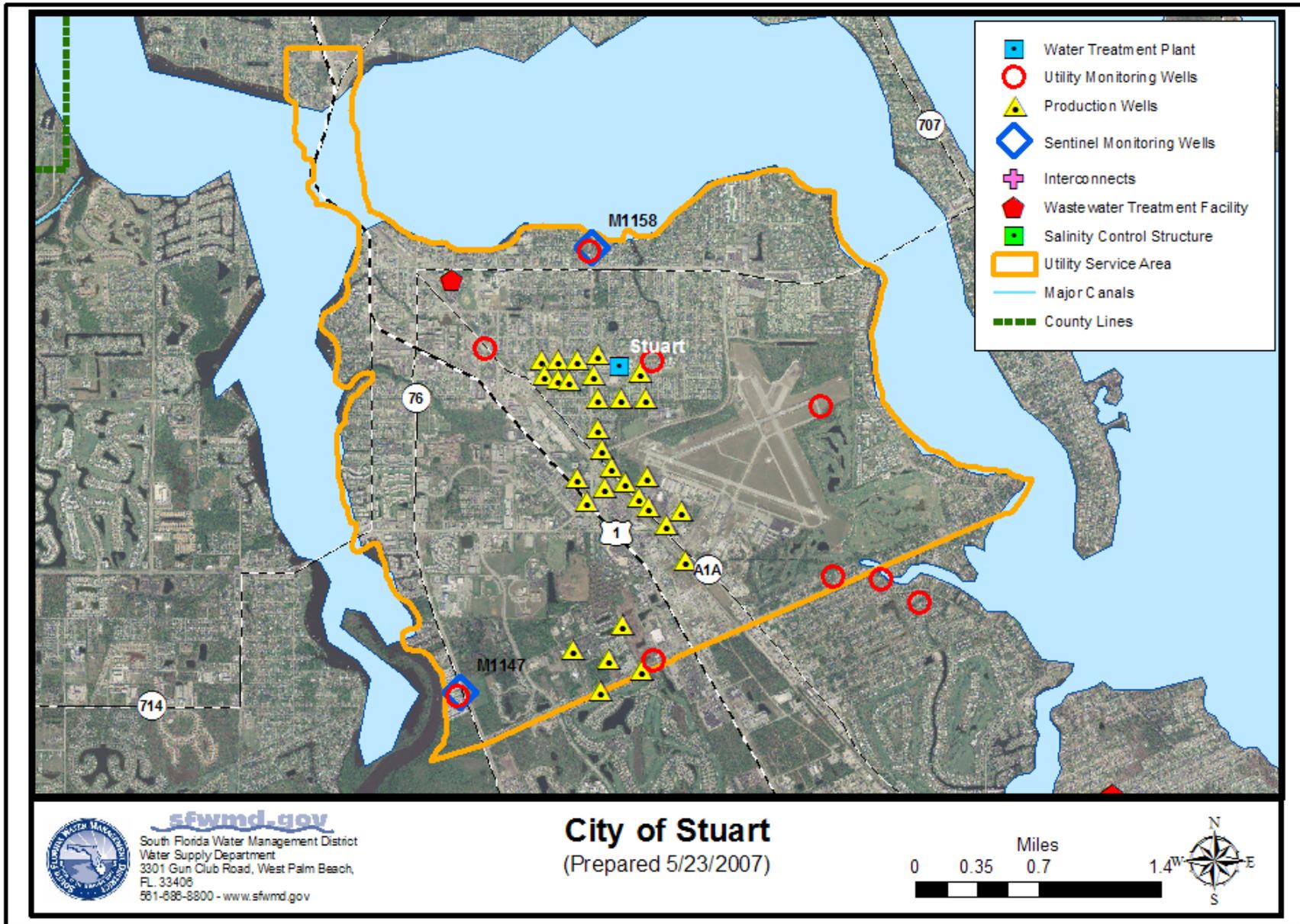
Utility Contingency Plan:

Interlocal Agreement. Resolution Number 46-99. The agreement is between Martin County Utilities and the City of Stuart. The two water systems agree to sell water to each other by means of the interconnects in the event of failure of either water system or other water emergency. The agreement does not specify volumes of water.

Interconnects & Supply Agreements with other Utilities:

The City of Stuart has three interconnections with Martin County. They are:

- (1) 12-inch connection at Federal Highway and North River Shores Drive
- (2) 8-inch connection at Indian Street and Carniville Street
- (3) 8-inch connection at St. Lucie Boulevard and the Airport Ditch



MILES GRANT WATER AND SEWER COMPANY

Utility Contact: Gail Murray (561) 346-7833 gmurray51@earthlink.net

SFWMD Coordinator: John Zahina (561) 682-2824 jzahina@sfwmd.gov

SFWMD Permit Reviewer: John Lockwood (561) 682-6884 jlockwo@sfwmd.gov

Water Use Permit #: 43-00086-W Issued: 09/04/03 Expires: 09/07/08

Annual Allocation: 52.564 MG

Max. Month. Allocation: 6.4 MG

2005 Pumpage: 74.28 MG (0.20 MGD)

2006 Pumpage: 54.76 MG (0.15 MGD)

Treatment Facilities:

Number of Facilities: 1

Total Capacity: 0.33 MGD

Treatment Method: Lime softening

Supply Sources:

Wellfields: 1 - Miles Grant Condo

Miles Grant Condo

Total Wells: 6 (4 primary and 2 standby)

Monitoring Wells:

Water Quality Monitoring Program Wells: 6 Production Wells, 7 Monitoring Wells

Water Level Monitoring Wells: 7 Monitoring Wells

Alternative Water Sources:

The applicant has an on-site wastewater facility, which provides an average of 125,000 GPD of reclaimed water to the Miles Grant Country Club for irrigation supply.

Utility Contingency Plan:

None

Interconnects & Supply Agreements with other Utilities:

None; this is a private utility with no interconnects.



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COASTAL UTILITIES OF CONCERN:
UTILITY SUMMARIES AND WELLFIELD MAPS

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FORT PIERCE UTILITIES AUTHORITY

Utility Contact: Derek Furness (772) 466-1600 x4389 dfurness@fpua.com

SFWMD Coordinator: Jim Jackson (561) 682-6334 jjackson@sfwmd.gov

SFWMD Permit Reviewer: Steven Memberg (561) 682-2133 smemberg@sfwmd.gov

Water Use Permit #: 56-00085-W Issued: 07/11/96 Expires: 07/11/06 (renewal in-house)

Annual Allocation: 4,007 MG (10.98 MGD)

Max. Month. Allocation: 452.6 MG (Based on 14.6 MGD)

2005 Pumpage: Floridan: 3.5 MGD (1,279 MGY) Surficial: 5.6 MGD (2,044 MGY)

2006 Pumpage: Floridan: 3.6 MGD (1,320 MGY) Surficial: 6.4 MGD (2,341 MGY)

Treatment Facilities:

Number of Facilities: 2

Total Capacity: 20 MGD

Treatment Method: 14.7 MGD Lime softening and 5.3 MGD reverse osmosis

Supply Sources:

Wellfields: 3 - North and South Surficial and Floridan

North Wellfield

Total Wells: 21

Limitations:

South Wellfield

Total Wells: 22

Limitations:

Floridan Wellfield

Total Wells: 9

Limitations: The Floridan Aquifer withdrawals are limited to a maximum of 6.8 MGD

Monitoring Wells:

Water Quality Monitoring Program Wells: 22; 2 Sentinel wells (FPMW2 and FPMW4)

Alternative Water Sources:

Floridan Aquifer. Three wells being deepened from 900' to 1,250'. Reverse Osmosis Treatment Plant being expanded.

Utility Contingency Plan:

None

Interconnects & Supply Agreements with other Utilities:

Port St. Lucie 1.44 MGD emergency interconnect

Areas supplied by FPUA

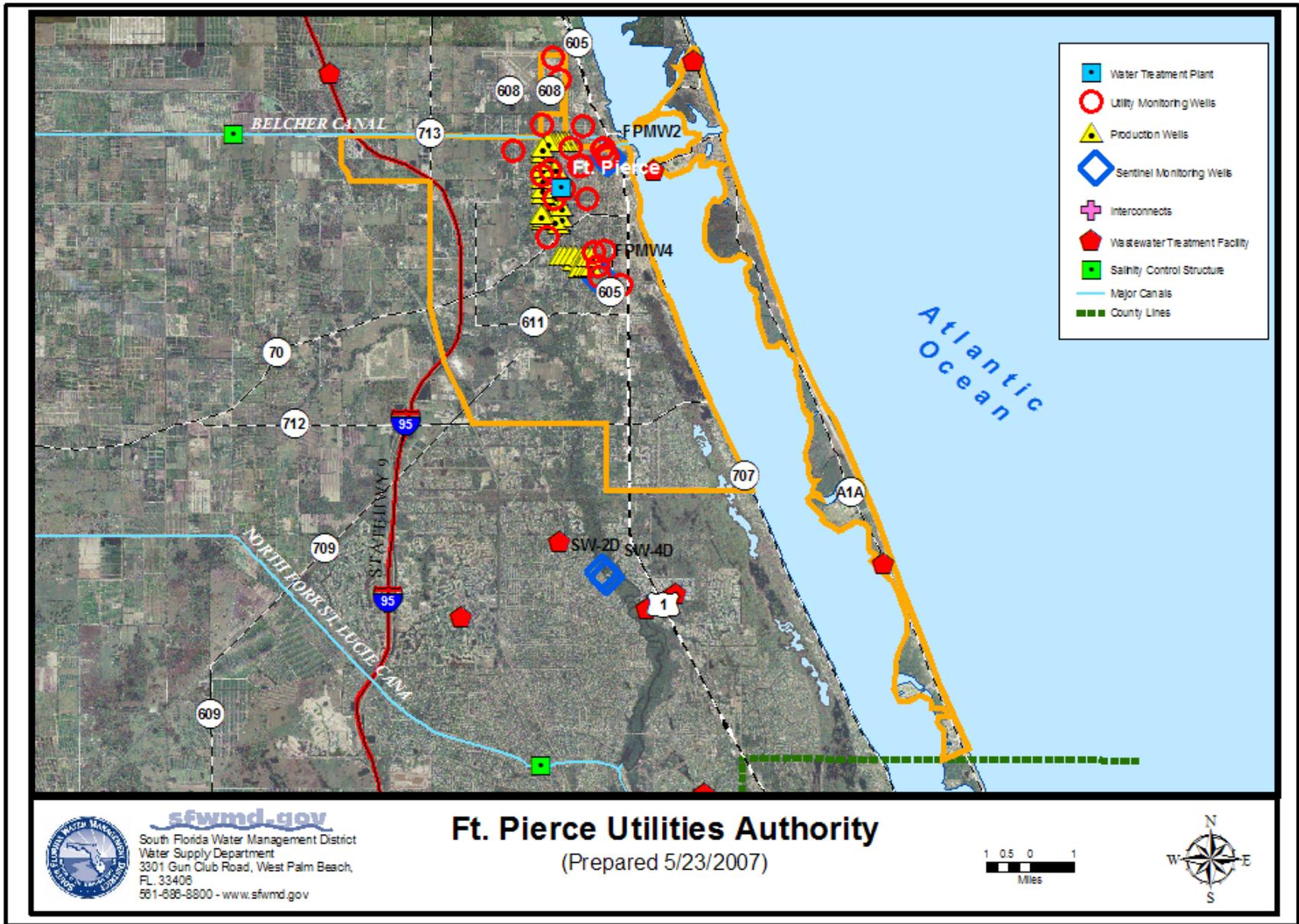
North Hutchinson Island: 0.26 MGD*

Okeechobee Road (West SLC): 0.65 MGD*

Indian River Estates: 0.63 MGD*

Taylor Dairy Road (North SLC): 0.53 MGD*

*Estimated Finished Water Demand in 2027



MARTIN COUNTY UTILITIES- NORTH (JENSEN)

Utility Contact: Robert Plummer (772) 221 1483 rplummer@martin.fl.us
SFWMD Coordinator: Nestor Garrido (561) 682-6908 ngarrido@sfwmd.gov
SFWMD Permit Reviewer: Jeff Scott (561)682-6924 jscott@sfwmd.gov

Water Use Permit #: 43-00102-W Issued: 03/15/2001 Expired: 03/15/2006 Application in-house?

Annual Allocation: 2,396 MG (8.07 MGD total/3.48 MGD SAS)

Max. Month. Allocation: 245.5 MG

2005 Pumpage: 8.06 MGD (2,944.916 MGY)

2006 Pumpage: 7.46 MGD (2,724.551 MGY)

Treatment Facilities:

Number of Facilities: 2

Total Capacity: 3.3 MGD (SAS) and 3.56 MGD (RO)

Treatment Method: One lime softening plant, and one reverse osmosis plant

Supply Sources:

Wellfields: 15 surficial aquifer; 4 Floridan aquifer

Surficial Aquifer

Total Wells: 15 SAS Wells

Limitations: Jensen Beach Peninsula is surrounded by the St. Lucie River, the North Fork of the St. Lucie and the Indian River, all sources of saline water.

Floridan Aquifer

Total Wells: 4

Limitations: None

Monitoring Wells:

A network of water level and chloride monitor wells exist at 13 locations on the peninsula.

Alternative Water Sources:

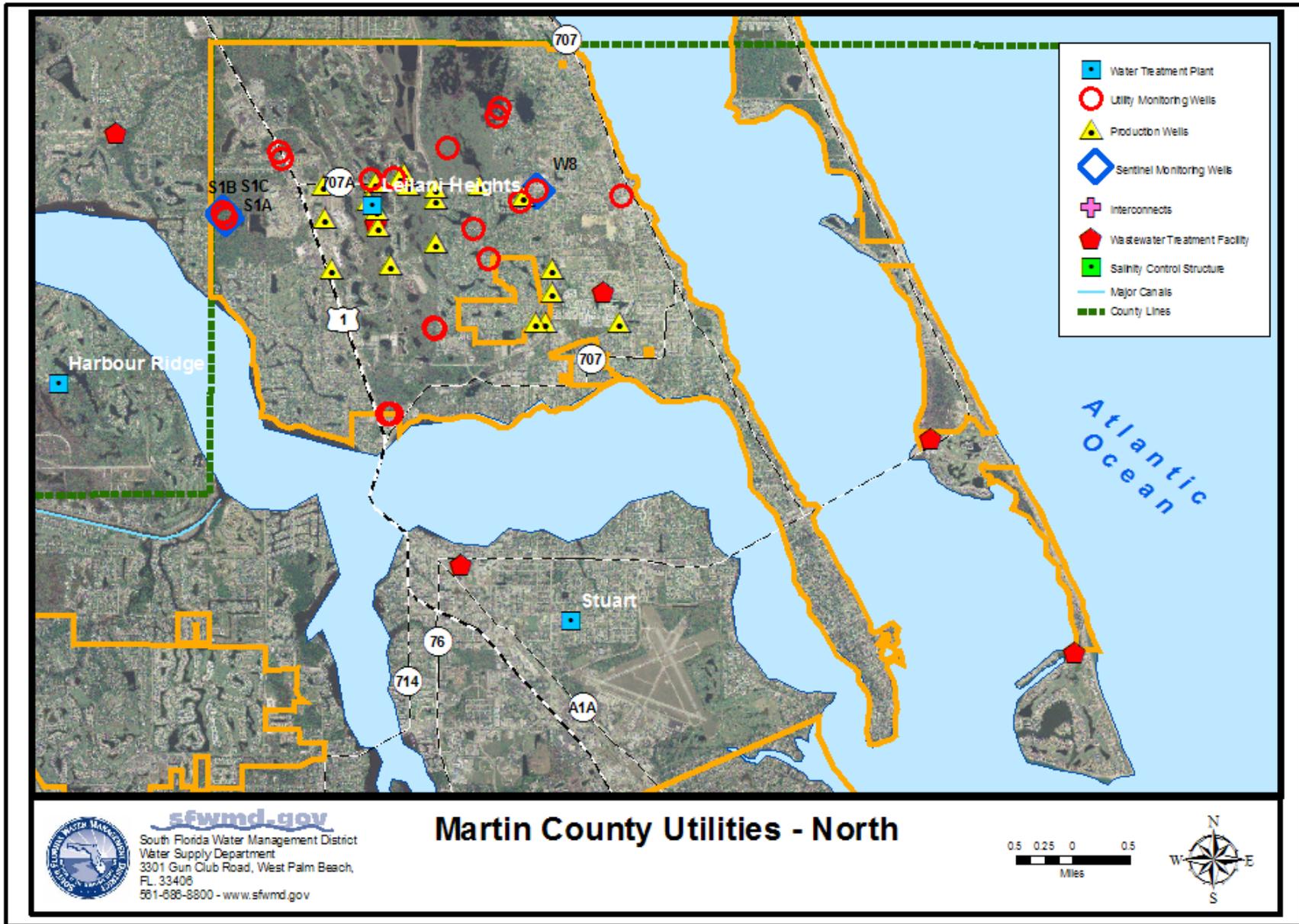
Martin County North has a Reverse Osmosis treatment plant with a capacity of 3.6 MGD to treat raw water from four (4) Floridan Aquifer wells. The North plant is interconnected to the Tropical Farms RO plant, which will have a capacity of 8 MGD when it begins operations in the summer 2007.

Utility Contingency Plan:

Alternative Water Supply and a consolidated system, which enables the transfer of treated water from Tropical Farms, Port Salerno and Martin Downs to Martin County North and vice versa.

Interconnects & Supply Agreements with other Utilities:

The North County, Tropical Farms, Port Salerno and Martin Downs systems are all interconnected. The Port Salerno system is connected with the City of Stuart between US 1 and A1A along Indian Street. The North County system is also connected to Port St. Lucie.



SOUTH MARTIN REGIONAL UTILITY

Utility Contact: Chuck Hale (772) 546-5112 chaesmru@bellsouth.net
SFWMD Coordinator: John Zahina (561) 682-2824 jzahina@sfwmd.gov
SFWMD Permit Reviewer: Steven Bell (561) 682-6935 sbell@sfwmd.gov

Water Use Permit #: 43-00066-W Issued: 07/09/03 Expires: 11/09/10

Annual Allocation: 1997 MG (8.41 MGD, of which 6.37 is the maximum allowed from the Surficial Aquifer System)

Max. Month. Allocation: Not Stated in Permit

2005 Pumpage: 1,247 MGY (3.42 MGD)

2006 Pumpage: 1,485 MGY (4.07 MGD)

Treatment Facilities:

Number of Facilities: 3- South Plant (Surficial Aquifer), North Plant (Surficial Aquifer) and Reverse Osmosis (Floridan Aquifer)

Total Capacity: South Plant- 4.54 MGD, North Plant- 3.61 MGD, Reverse Osmosis Plant- 2.0 MGD

Treatment Method: Lime Softening (SAS) and Membrane (RO)

Supply Sources:

Wellfields: 2- South System and North System

South System Wellfield: Primary: 10 wells (8 Surficial Aquifer, 2 Floridan Aquifer), Standby: 6 wells (Surficial Aquifer), Remediation: 3 wells (Surficial Aquifer).

Limitations: Well 19 (Primary) supplies Eaglewood Golf Course with irrigation water and also may operate as a standby well in the event of an emergency. Wells S12 and S13 (Standby) will only be operated 1 day per month to exercise pumps; in the event of an emergency such as the loss of an active well, permission will be requested from the District for a longer period of operation. Saline Water Management Wells at the South Wellfield will operate at a rate not to exceed 0.144 MGD per well for a total not to exceed 0.432 MGD to facilitate the remediation of the saline water intrusion.

North System Wellfield: Primary: 9 wells (Surficial Aquifer), Standby: 3 wells (Surficial Aquifer)

Monitoring Wells:

Three standby wells at the South System Wellfield (see above, wells S3, S7 and S11) are used for monitoring only. These are operated once per week only to obtain representative water samples.

Alternative Water Sources:

The Reverse Osmosis Plant draws from the Floridan Aquifer. At the South Plant, 100 percent of all wastewater is reused by either recharging the groundwater system through septic tanks, drain fields, or by reclaimed irrigation. At the North Plant, reclaimed water is provided to the Loblolly Pines and Medalist golf courses for irrigation use.

Utility Contingency Plan:

None; They have remediation wells, but no contingency plan in case.

Interconnects & Supply Agreements with other Utilities:

Interconnected with Martin County, recently installed connection with Tequesta (last summer).

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