

## **Potable Water**

Sub-Element

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## **II D POTABLE WATER SUB-ELEMENT**

### **1. INTRODUCTION**

The water supply and potable water sub-element is prepared in accordance with Chapter 163, F.S. and Rule 9J5.011, F.A.C.

#### **a. History**

In regards to potable water production and distribution, until the time of the first annexation by the incorporated Town of Greenacres in December of 1960, all water service was provided by private wells. Due to a series of annexations, commencing with the Lake Worth Hills Subdivision, the City entered into franchise agreements with Utilities Development Company (UDC) and Southern Gulf Utilities. "Villa Del Trio was the first subdivision in the City to receive direct water service from System No. 2." This system which is currently owned by Palm Beach County Water Utilities Department (PBCWUD), serves the City of Greenacres. As more development occurred, developers were required to install water distribution systems that tied into the PBCWUD system.

In regards to water supply, through Senate Bills 360 and 444, the 2005 Florida Legislature modified Chapter 163 Part II (the state's growth management statute) to require water supply planning. The law now requires that local governments which are encompassed within a regional water supply plan, such as Palm Beach County and the City of Greenacres, to update their comprehensive plans within 18 months of the adoption or update of the regional water supply plan. The South Florida Water Management District adopted the 2005-2006 Lower East Coast Plan Update on February 15, 2007. The legislation requires coordination between local government comprehensive planning and the water management district's regional water supply plans and seeks to establish a closer link between development decisions and the availability of water.

#### **b. Terms and Concepts**

Although the City of Greenacres has no operational responsibility in the provision of potable water to City residents, this sub-element will still address the one important issue: Is there sufficient good quality water available to adequately serve residents of today as well as future residents?

A potable water supply system normally consists of a water supply source, a treatment plant, and a distribution and storage network. Surface water stored in natural lakes, man made reservoirs, groundwater, or any combination of the three, usually constitute the supply source for a system. The selection of a source for any system must consider the type and quality of sources available and the cost of developing the source for use.

The South Florida Water Management District has the responsibility to ensure an

adequate supply of water within the region to meet the needs of potable water suppliers (such as PBCWUD), individual users (domestic wells), agriculture, and the environment (the Everglades, rivers, etc.). This is accomplished through planning (such as the Comprehensive Everglades Restoration Plan and the Lower East Coast Regional Water Supply Plan) and permitting (such as Consumptive Use Permits for a water utility's wellfield).

The water supply system consist of lakes, canals, stormwater diversion and storage areas, aquifers, withdrawal wells, underground water storage wells (Aquifer Storage and Recovery ASR), water re-use projects (irrigation quality treated sewerage, man-made treatment wetlands), and aquifer recharge projects (such as lake recharge through canal diversion).

Before being used for public consumption, water must be treated. Treatment removes impurities from the raw water in order to improve its quality for either public health or aesthetic reasons, or both. The treatment process adds to the cost of supplying water but it also expands the range of raw water sources that can be utilized.

After treatment, the water is supplied to individual users in a community by way of a network of pipes and storage reservoirs. Large transmission lines, called distribution mains, carry water to major demand areas and interconnect with a network of smaller lines which eventually supply individual establishments. Both the distribution mains and distribution network should be interconnected to form flow loops to allow water to circulate from various portions of the system to areas of highest momentary demand.

Water is delivered under pressure within the distribution system in order to ensure adequate flow to meet demands. Demand fluctuates during each day, usually exhibiting peaks during the morning and evening, corresponding to periods of highest residential use. Localized demand peaks also occur when the system is utilized for firefighting purposes. In order to provide adequate quantities and pressure to meet peak use and fire flow demands, storage tanks are linked with the distribution system at strategic locations. During low demand periods these tanks are filled as water is pumped into the system. During the peak demand periods, water flows from the tanks back into the system to augment flows and maintain pressure. Ground level and elevated storage tanks are both commonly used. Many systems also include auxiliary pumps which operate only during peak demand periods.

## 2. INVENTORY AND ANALYSIS

### a. Operator and Service Area

Overall, regional water supply is coordinated and controlled by the South Florida Water Management District (SFWMD) through the Lower East Coast Water Supply Plan and the District's operating rules and policies. The Plan covers the

following key areas:

- 1) Documents existing demands and projects future water demands through 2025 for agriculture, urban uses, and other categories.
- 2) Identifies resource issues, including constraints on development of new traditional raw water sources.
- 3) Evaluates the water source options available within the Lower East Coast planning area. Alternative water supply sources include brackish groundwater, reclaimed water, new storage capacity for surface and/or groundwater, and seawater.
- 4) Discusses conservation.
- 5) Identifies and discusses water resource development projects.
- 6) Identifies water supply projects that will meet future human and environmental needs.
- 7) Focuses on alternative water supply projects, such as brackish water from the Floridan Aquifer, captured storm water, aquifer storage and recovery (ASR) systems, and expanded use of reclaimed water.
- 8) Describes funding opportunities available through the SFWMD to foster alternative water supply development.

Local water supply to meet the PBCWUD's production needs for potable water is planned through the Utility's 20 Year Water Supply Work Plan. This plan was adopted on April 11, 2008 and has been coordinated with the SFWMD's regional plan and with the other water utilities in Palm Beach County. The City of Greenacres participated in population projection planning meetings with the PBCWUD, the Palm Beach County Planning Division, and numerous other cities and utilities in February and March of 2008 prior to the County completing their plan. The same population projections are used in the PBCWUD plan and the City of Greenacres Comprehensive Plan. The PBCWUD Water Supply Plan and the County's Comprehensive Plan amendments (scheduled for adoption in August of 2008) address the development of traditional and alternative water supplies, bulk sales agreements, and conservation and reuse programs that are necessary to serve existing and new development for a 20 year planning period.

Potable water requirements of the City of Greenacres residents are being met by the Palm Beach County Water Utilities Department. The County supplies water on a retail basis, from a system of numerous water treatment plants, wellfields, and storage tanks. With the exception of one (1) obsolete storage tank, no County facilities are located within the City.

The City of Greenacres lies entirely within the service area of the Palm Beach County Water Utilities Department (PBCWUD). PBCWUD operates an interconnected distribution system, five water treatment plants, five Surficial Aquifer wellfields, one new Floridan Aquifer wellfield under construction, and one additional Floridan Aquifer wellfield in the planning stages. A storage facility was located just north of the Jog Road and Forest Hill Boulevard intersection on the west side of Jog Road, but it is currently not in service since its function was

replaced by a water main improvement carried out by PBCWUD.

b. Design Capacity

1) Existing Conditions

The permitted capacity for all plants owned and operated by PBCWUD in 2008 is 87 million gallons daily (MGD) average and 129 MGD maximum per Permit #50-00135.

2) Projected Demands

Table 1 summarizes demand and supply for the entire Palm Beach County Water Utilities Department service area, including the City of Greenacres. Projections in Table 1 rely on the level of service standards adopted by PBCWUD for City residents through the year 2025. Within the same time frame, capacities will expand sufficiently to accommodate total projected potable water demands on Palm Beach County Water Utilities Department's interconnected distribution and production system. All projections include residents of the City of Greenacres, thus the raw water and potable water supply will be more than adequate to supply the City of Greenacres during the planning period.

**TABLE No. 1  
Facilities Capacity Analyses**

|   | 2006      | 2010      | 2015      | 2020      | 2025       |
|---|-----------|-----------|-----------|-----------|------------|
| Population Served (1)                                     | 431,091   | 449,101   | 499,336   | 566,986   | 596,289    |
| Demand per Capita (gpd) (2)                               | 126       | 126       | 126       | 126       | 126        |
| Contracted Bulk Potable Water (mgd)                       | 2.6       | 9.3       | 13.1      | 13.1      | 14.1       |
| Total Finished (Potable) Water Average Daily Demand (mgd) | 57        | 66        | 76        | 85        | 89         |
| <b>Total Raw Water Average Daily Demand (mgd) (3)</b>     | <b>67</b> | <b>77</b> | <b>89</b> | <b>99</b> | <b>104</b> |
| Available Raw Water Facility Capacity (mgd) (4)           | 108       | 119       | 127       | 138       | 148        |
| Raw Water Facility Capacity Surplus (Deficit) (5)         | 42        | 42        | 38        | 39        | 43         |
| Permitted Raw Water Allocation (mgd annual average) (6)   | 87        | 87        | 87        | 87        | 87         |
| Surficial Aquifer Average Daily Flow Withdrawal (mgd) (7) | 67        | 77        | 82        | 84        | 84         |
| <b>Permitted Surplus (Deficit)</b>                        | <b>20</b> | <b>10</b> | <b>5</b>  | <b>3</b>  | <b>3</b>   |

1. Population served represents projected retail customers and self-served conversions.
2. Demand per Capita based upon population served.

3. Average Daily Flow raw water = 1.17 x Average Daily Flow finished (potable) water (per historical and capacity based analyses).
4. Raw Water Facility Capacity = Wellfield Capacity with two largest wells out of service for each individual wellfield.
5. Calculated by subtracting average daily demand from available facility capacity.
6. Permitted allocation from Permit #50-00135.
7. Values do not reflect offsets from alternative water supplies.
8. Table is based on Table 6-1 in the PBCWUD Water Supply Work Plan of August 14, 2008.

c. General Performance - LOS

1) Service Concurrent with Development

Palm Beach County is currently following their latest Water and Wastewater Master Plan and their Water Supply Work Plan in assuring the residents of Greenacres an adequate supply of water, both presently and in the future. The extensive growth which has occurred in the past few years, not only in the City of Greenacres but also countywide, has had a major impact on the provision of potable water

Palm Beach County's Comprehensive Plan and the City's Comprehensive Plan include requirements that capacity must be documented prior to approval of new development. This will assure that developments are not approved unless service will be available concurrent with demand. Therefore the City's new developments shall be approved only when capacity is available to provide for the needed potable water supply. This can be achieved in two ways:

1. When the developer obligates funds to provide that developments' share of capital improvements to the system; and
2. As part of the County's capital improvement program based on 5 year planning periods, which would obligate funds for those improvements.

2) Capacity Assessment - Future

Consistent with methodology used in the County's Water Supply Work Plan, future needs have been evaluated on the basis of average day and maximum day demand factors as based on historical annual water production for the County water supply system. Average day demand provides an estimate of resident population water demand and has been used to derive the level of service standards for the service areas. Maximum day demand represents annual peak daily demand and provides an estimate of combined resident and seasonal population demand. Raw water production must be capable of meeting average day demands. Treatment, including pumping of treated water to the distribution network, must be capable of meeting maximum day

demands. Storage capacity, to augment flow and pressure for peak demand and fire-flow needs, must equal or exceed 30 P.S.I.

To ensure sufficiency of future capacity, Palm Beach County Water Utilities Department (PBCWUD) has adopted several policies which provide a guarantee to future Greenacres City residents, the provision of more than the minimum level of service. These policies provide that:

1. PBCWUD shall begin to design for additional capacity when 80% of facility capacity is demanded.
2. Construction of additional capacity shall begin when 90% of facility capacity is demanded.

d. Wellfields

Palm Beach County Water Utilities Department withdraws water from the surficial aquifer system through a series of water supply wells. There are no wellfields located within the City of Greenacres City limits, however, zones of influence surrounding the Water Treatment Plant No. 2 wells, do project into the City. (See Map No. 1). The exact location of these "zones" is determined by the Palm Beach County Department of Environmental Resources Management based upon travel time contours and one foot draw down contours. These Zones of Influence are described as follows:

1. Zone One (1): The land area situated between the well(s) and the thirty (30) day travel time contour.
2. Zone Two (2): The land area situated between the thirty (30) day and the two hundred ten (210) day travel time contours.
3. Zone Three (3): The land area situated between the two hundred ten (210) day and the five hundred (500) day travel time contours.
4. Zone Four (4): The land area situated beyond the five hundred (500) day travel time contour and within the one (1) foot drawdown contour.

Restrictions are placed within each zone of influence which affect all nonresidential activities. These zones and types of surrounding land uses are identified in the Future Land Use Element of this Plan. The City supports Palm Beach County efforts to implement the adopted Wellfield Protection Ordinance No. 88-7. Map No. 2 gives a pictorial representation of the previously used terms associated with "Cone of Influence."

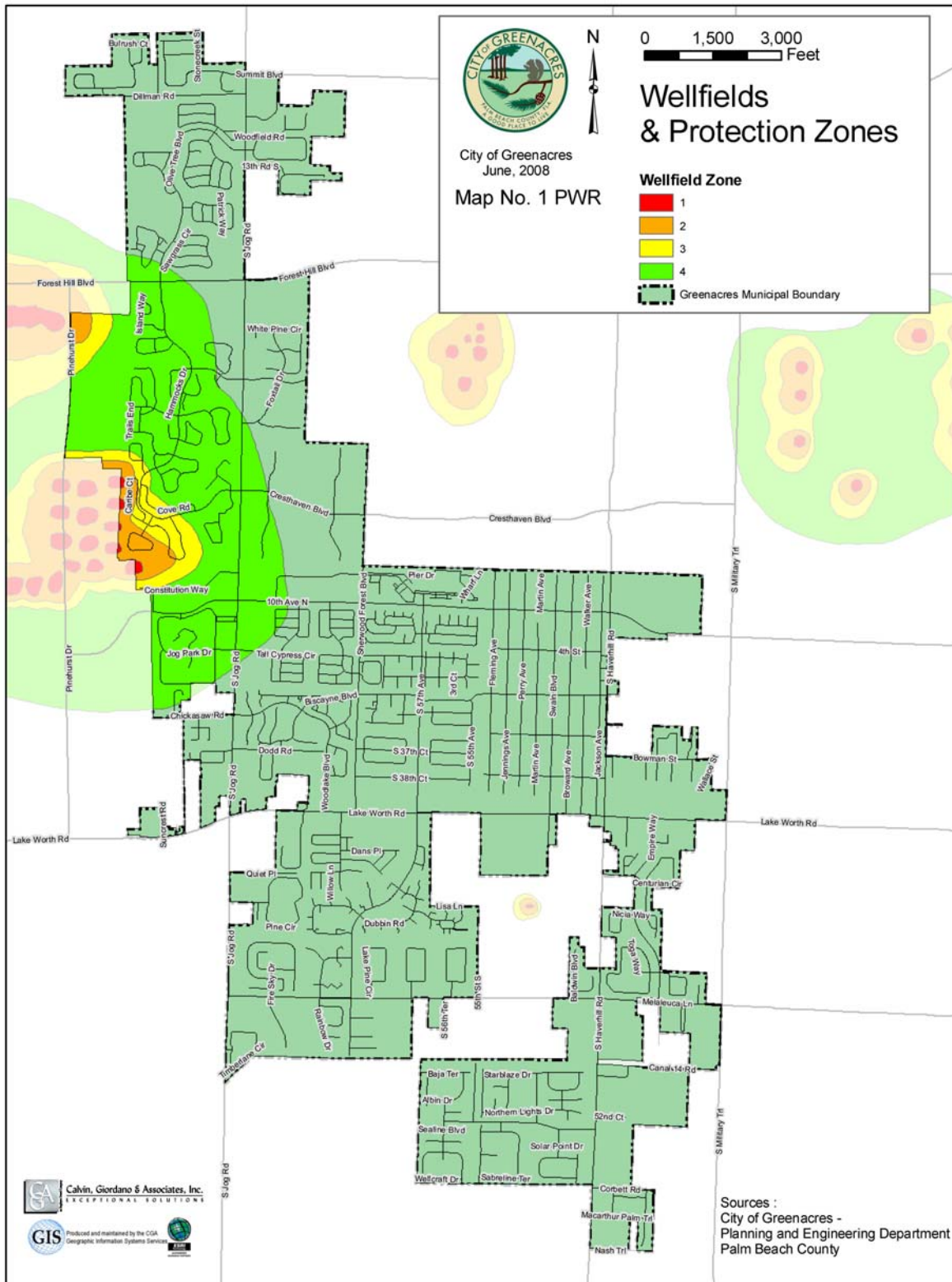
e. Water Conservation

The task of reducing the annual increases in water consumption can be met through cooperation at State, County and City levels. The City supports the proposals of

the Palm Beach County Department of Environmental Resources Management in reducing the amount of water consumed by households, business, industry and agriculture. Water consumption figures for the City have been supplied earlier in this Sub-element as per capita water usage. Typically, water utilized by households is considered nonconsumptive water use because it is returned to the hydrologic cycle, although some of it has been polluted, while much of the water used for irrigation will be lost to the cycle.

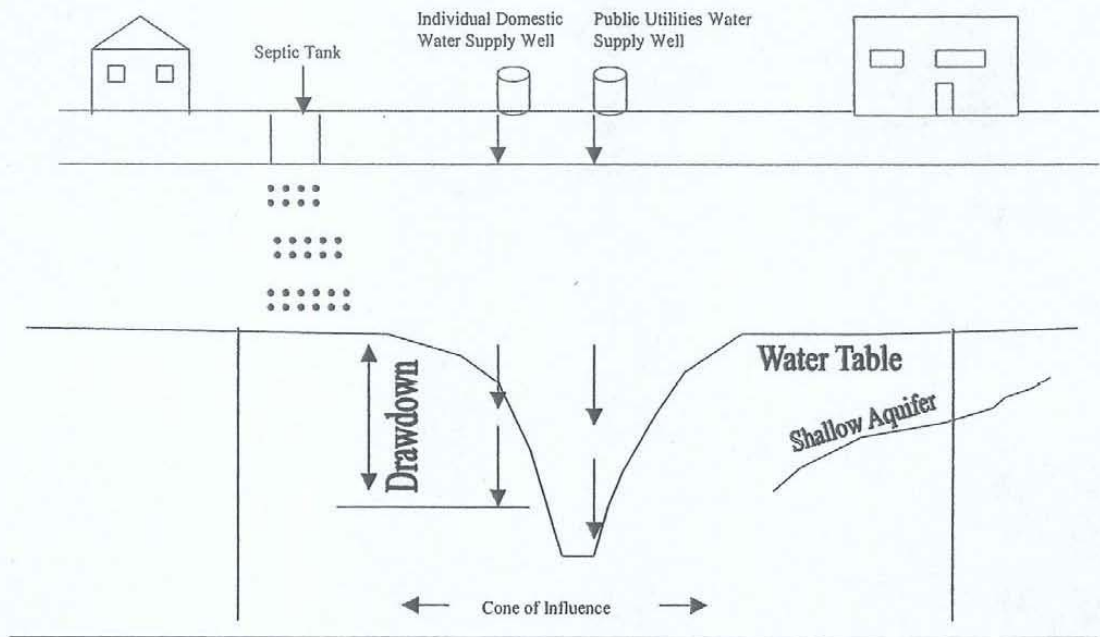
To counter these problems, the City of Greenacres implemented reforms, consistent with County plans, in two areas:

1. Building codes requiring water saving devices
2. Xeriscape landscaping requirements.



**Map No. 2 PWR**

**CONE OF INFLUENCE "CROSS SECTION"**



1) Building Codes

Water conservation is achieved through requirements on new construction which includes water saving devices on new homes and businesses.

As part of this Plan, PBCWUD established a program limiting potable water use in irrigation by prohibiting the metering of systems used exclusively for irrigation.

2) Xeriscape

This Plan includes incorporating xeriscape principles as part of the Greenacres City Landscape Ordinance. The term "xeriscape" means water conserving, drought tolerant landscaping or simply the use of appropriate plant material that will survive and flourish with comparatively little supplemental irrigation.

"Approximately one-half of the per capita water demand in urban areas of south and central Florida is for residential outdoor use." Through the appropriate use of plant material, this percentage could be significantly reduced.

The City of Greenacres has set an example by incorporating xeriscape principles in the design, installation and irrigation of landscapes at City parks, City Hall and along traffic corridors. In mandating xeriscape principles through the City's Landscape Ordinance, on-site inspections would be required to ensure compliance.

f. Regulatory Framework

1) Federal

The federal government has established quality standards for the protection of water for public use, including operating standards and quality controls for public water systems. These regulations are provided in the Safe Drinking Water Act, Public Law 93-523. This law directed the Environmental Protection Agency (EPA) to establish minimum drinking water standards. The EPA standards are divided into "primary" (those required for public health) and "secondary" (recommended for aesthetic quality) categories.

2) State

In accordance with federal requirements, the Florida Legislature has adopted the Florida Safe Drinking Water Act, Sections 403.850 - 403.864, F.S. The Florida Department of Environmental Protection (DEP) is the state agency responsible for implementing this act. In this regard, DEP

has promulgated rules classifying and regulating public water systems under Chapter 17-22 of the F.A.C. The primary and secondary standards of the Federal Safe Drinking Water Act are mandatory in Florida.

Regional water management districts are responsible for managing water supplies to meet existing and future demands. The City of Greenacres lies in the jurisdiction of the South Florida Water Management District (SFWMD) which regulates the consumption of potable water through a permitting system through which water resources are allocated among the permitted consumers. The SFWMD Lower East Coast Water Supply Plan has been discussed above.

3) Local

The Palm Beach County Department of Environmental Resources Management is responsible for the enforcement of programs required by the DEP regulations. As part of the Palm Beach County Wellfield Protection Ordinance No. 88-7, the PBC Water Utilities Department must submit water quality and production records to the PBC Environmental Resources Management Agency for determination of compliance with DEP regulations.

Palm Beach County Water Utilities Department's Water Supply Work Plan and Uniform Policy and Procedure Manual provide the regulations for their acquisition of adequate raw water supply and production and distribution of adequate potable water supply.