



Indian River County 2030 Comprehensive Plan

Chapter 3B

Potable Water Sub-Element

Indian River County Community Development Department

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INTRODUCTION

Potable water is the term applied to water that is considered fit for human consumption. Each day, the average county resident consumes approximately 104 gallons of potable water. In addition to being used for drinking, potable water is used for cooking, washing clothes and dishes, bathing, and for various commercial/industrial purposes.

Access to potable water and the type of potable water systems available have major implications regarding the type and density of development which can be accommodated within an area. This sub-element not only addresses the implications of potable water on development, but also addresses the various components of potable water systems, the type of potable water systems, existing regulations regarding potable water, and other factors.

A potable water system is comprised of three components: a raw water source (supply), treatment plants, and a distribution and storage network.

PURPOSE

The purpose of the Potable Water Sub-Element is to identify existing and projected demand for potable water based on the county's population, historical water usage, and existing and future land uses; to identify the capacity of existing facilities; to identify the operational responsibilities, geographic service areas and the level of service provided by each facility; and to identify future potable water needs, including those areas where public water will be provided and those areas where it will not be provided.

The Potable Water Sub-Element is structured to address the potable water needs of the county through the time horizon of the comprehensive plan. This sub-element will provide direction for the county in determining sound management of its potable water system in a manner consistent with federal, state and local law. Finally, potable water service, in conjunction with land use regulations and other infrastructure elements, will be used as a means of managing future growth in the county and directing growth within the Urban Service Area.

BACKGROUND

According to the United States Department of the Interior, Geological Survey publication entitled "Water for Florida Cities", only a few large cities obtain all or part of their water supply from surface water resources. The cities of Tampa, Melbourne, and West Palm Beach are the largest municipalities within the state which use surface water as their potable water supply. The Indian River County water system, like the majority of the water systems within the state, utilizes groundwater as its source of potable water.

Within Indian River County, water supply systems fall into one of three categories. These categories are as follows:

- public potable water systems
- private potable water systems
- private wells

Initially, all potable water in Indian River County was obtained from private wells. Even today, many county residents get their water from individual, private wells. Over time, however, the need to serve larger residential and non-residential projects resulted in the establishment of centralized potable water systems. Initially, most of these centralized systems were privately owned and operated.

In Indian River County, the City of Vero Beach was the first government to establish a public water system. Within the unincorporated county, no publicly owned, centralized water system was established until the late 1970's.

Prior to 1978, Indian River County did not operate any potable water treatment facilities. In 1978, however, the county acquired the Gifford Water Treatment Plant from the Farmer's Home Administration (FmHA). Prior to being taken over by the FmHA, the Gifford facility had been owned and operated by a private company. When that private operator experienced financial difficulties, the water treatment facility experienced major problems. Although the county was reluctant to become a utilities provider, an agreement was reached between the county and the FmHA by which the county agreed to take over and operate the Gifford Water Treatment Plant. In return, the FmHA gave the County a \$20,000,000.00 loan for the purpose of providing potable water to County residents.

In 1987, the first Indian River County Public Water System Master Plan was developed. The purpose of the Master Plan was to establish a program for the economical and orderly expansion of the County's water system so that the system would be capable of supplying the potable water needs of the eastern portion of the county. That document has been updated several times since 1987. As

indicated in the Master Plan, the County Utilities Department has the responsibility for operation of the county's potable water system.

Since 1990, significant expansion of the County's potable water system has occurred. From 1990 to 2008, the potable water system not only increased its geographic service area, it also significantly increased its customer base. During that time, the number of water customers increased by 137% (from 17,000 to 40,300 customers), while the number of private water treatment plants operating in the county decreased from 29 to 4. Because most of the main water lines called for in the Master Plan have been installed, centralized potable water service is now available to most of the urban service area.

POTABLE WATER FACILITIES

Generally, potable water facilities consist of a water supply, treatment plants, storage facilities, and a distribution system. While a potable water system's water supply source can be surface water, groundwater, or a combination of both, the water source is usually a reflection of the type of water available and the cost of developing the source. Before being used for public consumption, most water must undergo treatment. Treatment removes impurities from raw water in order to improve its quality for either public health, aesthetic reasons, or both.

After treatment, potable water is supplied to individual users by way of a network of pipes and storage reservoirs. Large transmission lines, called distribution mains, form the "spine" or frame of the distribution network. Those main lines carry water to major demand areas and interconnect with a network of smaller lines which serve individual projects such as subdivisions and shopping centers. The smallest lines of the distribution network supply individual houses and establishments. In many cases, the distribution network is inter-connected to form flow loops to allow water to circulate within the system to areas of highest demand.

In order to provide adequate flow to meet demand, water is delivered under pressure. Throughout the day, demand for water varies. Usually, morning and evening are the times of peak demand. These peaks correspond to periods of highest residential usage. A second type of peak demand occurs when water is utilized for fighting fires. In order to provide adequate quantities and pressure to meet peak and fire flow demands, water storage tanks are used. During low demand periods, water is pumped into these storage tanks. During peak demand periods, water is pumped from the tanks back into the system to augment flows and maintain pressure. Ground level and elevated storage tanks are both commonly used. Sometimes, the distribution system includes auxiliary pumps which operate only during peak demand periods.

EXISTING CONDITIONS

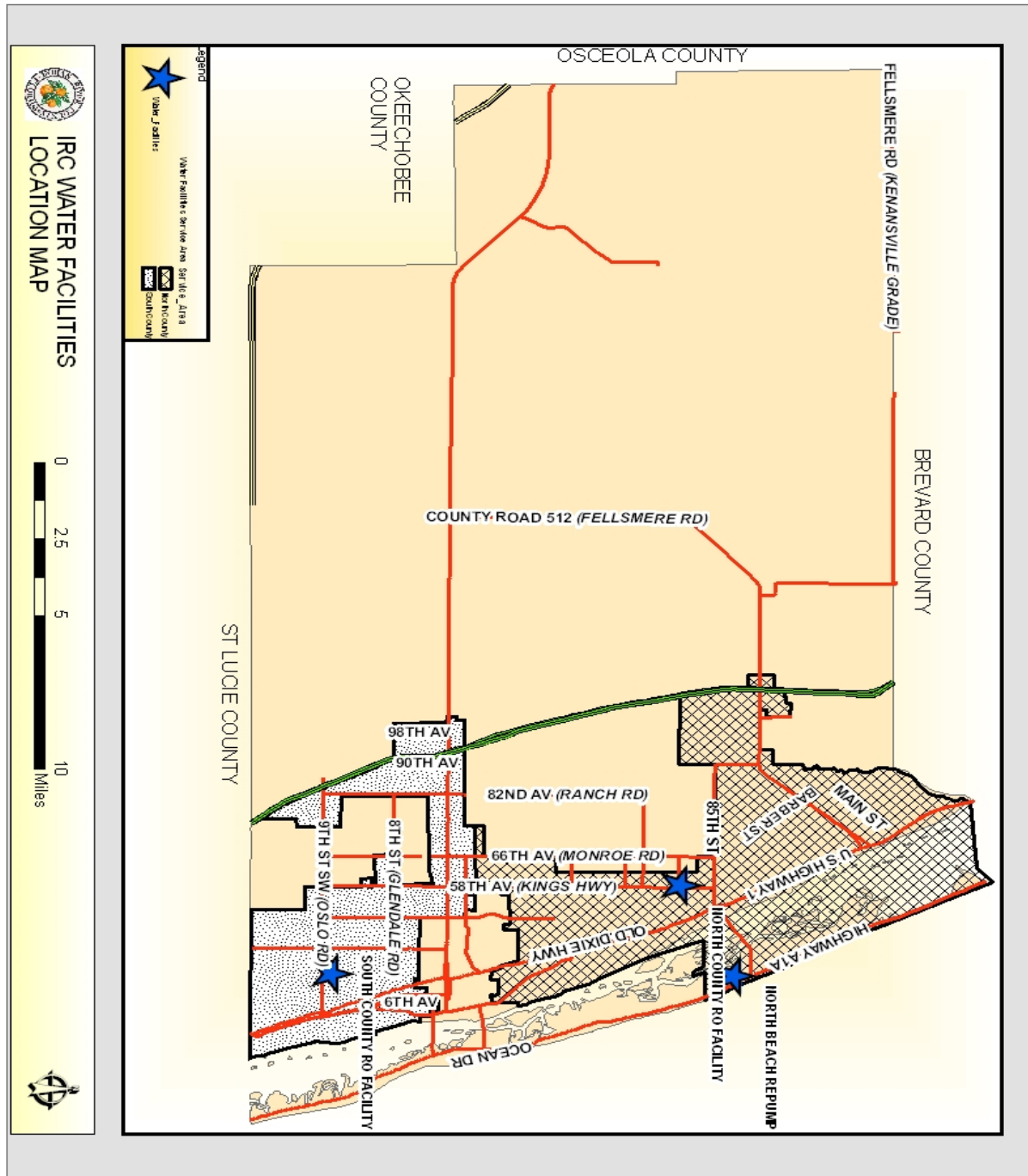
To adequately address existing conditions, this plan must identify all of the potable water systems in the county. In so doing, it is helpful to consider the systems by category. Within Indian River County, potable water is provided by the County Utilities Department, the City of Vero Beach, the City of Fellsmere, franchised water treatment facilities, and private wells. Each of these systems must be considered in terms of its geographic service area, water supply, water treatment, and water distribution. Figure 3.B.1 shows the county potable water service areas and the City of Vero Beach potable water service area.

Within Indian River County, public water supply systems, private water supply systems, and private wells all depend upon groundwater as their water supply source. Even with groundwater used as a supply source by all systems, there are still substantial supply differences among the various systems.

As with water supply sources, treatment methods vary among water systems within the county. In fact, one reason that treatment methods vary is because the supply sources differ. In fact, treatment methods sometimes differ even among systems using similar supply sources. Therefore, it is important to identify and assess treatment methods and capacities for each water system in the county.

The final component of the potable water system is distribution. This is the process by which potable water is transmitted from the treatment plant to the user. Consisting of pipes, mains, pump stations, elevated and ground storage tanks, as well as other facilities, the distribution system is an important component of any potable water system.

Figure 3.B.1
Indian River County 2008 Potable Water Service Area



PUBLIC WATER SYSTEMS

Operated by the County Utilities Department, the county water system is the largest provider of potable water in Indian River County. This system presently consists of two geographic service areas (North County and South County). Although each service area has its own water plant, the system is interconnected to allow either plant to serve the service area of the other plant.

In 2006, 30,402 (63.09%) of the unincorporated county's 48,188 residential units were connected to the regional potable water system. At that time, all customers of the county's system, including those living in municipalities, totaled 40,300. This reflects a significant expansion of the County's potable water system that occurred during the 1995 to 2006 period. During that time, expansion of the county's water system was extensive in terms of increased geographic area served and in terms of new customers.

Currently, every new subdivision within the Urban Service Area is required to connect to the regional water system if the development meets either of the following criteria.

- It is within one-quarter of a mile of existing water lines; or
- It contains 25 or more lots/units.

At the present time, the existing regional potable water system serves commercial/industrial development as well as residential development. Since plan adoption, the regional potable water system has been expanded to serve most of the commercial/industrial areas in the county, including the three I-95 commercial/industrial nodes. Because most of the main water lines referenced in the 2004 Master Plan have been installed, centralized potable water service is now available to most of the county's urban service area. As a result of that expansion, the development potential of land within the Urban Service Area (USA) has greatly increased for both residential and commercial projects.

Currently, there are four public regional water treatment plants operating in the county. Two of those plants are operated by the Indian River County Utilities Department; a third plant is operated by the City of Vero Beach, and a fourth plant is operated by the City of Fellsmere. At present, there are three privately owned treatment plants within the county.

The City of Vero Beach provides potable water service to the Town of Indian River Shores as well as to the unincorporated parts of the south barrier island and to other unincorporated areas around the city limits. Besides providing water service to the unincorporated area, the county provides potable water service to the City of Sebastian, the Town of Orchid, and the northern portion of the Town of Indian River Shores. In addition, the county has an agreement with the City of Fellsmere to provide emergency water if needed.

Combined, the design capacity of the four public water treatment plants is 24,720,000 gallons/day, an amount sufficient to accommodate the existing combined average daily demand of 15,990,000 gallons/day. In 2006, the design capacity of the county's regional potable water system was 12,070,000 gallons/day, while demand was 9,700,000 gallons/day. At that time, per capita water use was approximately 104 gallons a day.

Currently, the plants operated by the county Utilities Department use the Upper Floridan aquifer as their primary water source, while the City of Vero Beach uses both the Surficial and Upper Floridan aquifers. The City of Fellsmere uses the Surficial aquifer only.

Both the County and the City of Vero Beach use reverse osmosis to treat water drawn from the Floridian Aquifer, while the City also uses a lime softening process to treat water from the Surficial aquifer. The reverse osmosis process produces brine as a by-product. At the water treatment plants, an aeration and chlorination process treats the brine by-product. Prior to the brine being discharged into the Indian River Lagoon, aeration and/or marsh treatment removes hydrogen sulfide and other volatile contaminants, such as gross alpha particles and ammonia.

Although the regional potable water system service area has been greatly expanded since 1995, there are still several existing subdivisions with undersized lots (subdivisions with lots less than one half acre that use individual wells and septic tanks) that are not yet served. While 94 of 183 residential subdivisions with undersized lots are now served by the county potable water system, one area that is not served is Vero Lake Estates, a large platted subdivision in the north part of the county.

In 2006, the County Public Works Department and the County Utilities Department proposed several new infrastructure projects, including the construction of potable water and sanitary sewer lines in Vero Lake Estates. Because of the anticipated assessment charges, however, residents declined to enter into an agreement with the County. Since then, the county utilities department, under direction of the Board of County Commissioners, has installed approximately 7 ¼ miles of master planned water main lines with fire hydrants throughout Vero Lake Estates.

In 2006, the total countywide permitted water withdrawal was approximately 72,659,360,000 gallons per year. Of the total permitted water withdrawals in 2006, potable water supply accounted for approximately 8%. Agriculture, including livestock, nurseries, and aquaculture, accounted for 82.3% of total permitted withdrawals, while golf course, landscape irrigation, recreation and other uses utilized the remainder of the total withdrawals. The table below summarizes this information.

Table 3.B.1
2006 Water Withdrawal Table
Indian River County

USE	Million Gallons/Year	Percentage of Total Permitted Withdrawals
Potable Water	5,819.63	8.01%
Agricultural (includes nurseries, livestock, aquaculture)	59,808.99	82.31%
Rec., Golf, Commercial/Industrial, Other	7,030.74	9.68%
Total	72,659.36	100%

While 72.7 billion gallons of groundwater were permitted for withdrawal in 2006, that does not account for private wells that exist, but are not subject to permitting by the SJRWMD. It is also possible that there are a significant number of wells that were put in place prior to the county's or the SJRWMD's permitting requirements. Those wells have never been regulated and may be in need of substantial repairs to ensure that old well casings are not leaking untreated water from the Upper Floridan aquifer into the Surficial aquifer.

According to the St. Johns River Water Management District (SJRWMD), there are 1,657 permitted wells that are 6 inches in diameter or greater in Indian River County. Currently, the Environmental Health Department permits wells that are 2 inches or less in diameter. Between 1995 and 2006, the Environmental Health Department issued 12,065 well permits, 4,272 of which were domestic water supply wells; the remaining permits were for irrigation wells. Over the last 5 years, the number of permits for domestic wells decreased by approximately 20%, to an annual average of 310 permits. This is due largely to the expansion of the county's regional potable water system.

At this time, potable water quality in all regional systems meets or exceeds safe drinking water standards. Since 1998, there have been no reported instances of privately owned or public water plant failures in the county.

Following is a brief description of the four regional potable water areas within the county.

Indian River County Water System

Indian River County operates the largest potable water system in the county. This system consists of two service areas. Those service areas are discussed below.

- **North County Service Area**

Located on the north side of 77th Street, west of 58th Avenue, the North County Reverse Osmosis Water Treatment Plant began operating in 1997. That plant serves the north county area. In addition to reducing chloride levels, the reverse osmosis treatment process removes color and turbidity. The treated water then is disinfected before distribution.

The North County Service Area of the Indian River County Potable Water System includes the City of Sebastian, the Town of Orchid, and the northern portion of the North Barrier Island, as well as the unincorporated areas of Gifford, Winter Beach, Wabasso, Vero Lake Estates, and Roseland. In addition, the North County Service Area includes the commercial/industrial node located on 37th Street, east of US 1. The Upper Floridan aquifer is the source of water for both the South and the North Water Treatment Plants.

Ranging from 1 to 20 inches in diameter, the county's water mains, or pipes, vary in size based upon the quantity of water to be transported. Within the North County Service Area, principal water lines are installed along the following roads:

- the US 1 corridor from 37th Street to the St. Sebastian River;
- CR 510 from SR A1A to CR 512;
- CR 512 from I-95 to U.S. 1;
- 102nd Terrace, north of CR 512;
- 58th Avenue, south of CR 510;
- 49th Street from 58th Avenue to US 1;
- 41st Street from 66th Avenue to Indian River Boulevard;
- 37th Street from US 1 to Indian River Boulevard; and
- others

From these principal lines, smaller lines branch out into the following areas:

- most of the Gifford area between US 1 and 43rd Avenue;
- the Geoffrey Subdivision;
- the Medical Services Subdivision;
- the Grand Harbor residential development;
- the Bent Pine residential development;
- the King's Music Land Subdivision;
- the High Pines Subdivision;
- the Pelican Point Subdivision;
- the Reflections on the River Residential Development;
- portions of the Sebastian Highlands;
- others

- **South County Service Area**

Located on Oslo Road, the South County Reverse Osmosis Water Treatment Plant began operating in 1981. That plant serves the South County Area. In addition to reducing chloride levels, the reverse osmosis treatment process removes color and turbidity. The treated water then is disinfected before distribution.

The Upper Floridan aquifer is the source of water for the South County Reverse Osmosis Water Treatment Plant. At the water treatment plant site, six wells provide raw water for the treatment plant, while a raw water piping system transports the untreated water to the treatment facility. The South County Reverse Osmosis Water Treatment Plant has a total capacity of 7.50 MGD, although it is currently operating at approximately 6 MGD.

Within the South County Service Area, principal water lines are installed along the following roads:

- the SR 60 corridor from 53rd Avenue to 102nd Avenue;
- 58th Avenue from Oslo Road to S.R. 60;
- 90th Avenue from SR 60 to 8th Street;
- 43rd Avenue from SR 60 to 13th Street, Southwest;
- 27th Avenue from 12th Street to 12th Street, Southwest;
- 20th Avenue from 12th Street to the St. Lucie County Line;
- the US 1 corridor from the Vero Beach City Limits to the St. Lucie County Line;
- 16th Street from 43rd Avenue to 58th Avenue;
- 12th Street from Indian River Boulevard to 58th Avenue;
- 8th Street from Indian River Boulevard to 66th Avenue;
- 4th Street from Indian River Boulevard to 66th Avenue;
- 1st Street, Southwest from 58th Avenue to the South Relief Canal;
- 5th Street, Southwest from 58th Avenue to Lateral J canal;
- Oslo Road from 82nd Avenue to US 1;
- 13th Street, Southwest from 58th Avenue to 9th Avenue, Southwest; and
- others.

Those principal lines branch out into smaller lines that serve smaller geographic areas such as subdivisions and development projects. Within the South County Potable Water Service Area, those smaller lines extend to most subdivisions.

City of Vero Beach Water System

The City of Vero Beach Water System serves an area larger than the city limits of Vero Beach. Presently, the City of Vero Beach Water Treatment Plant serves the City of Vero Beach, the Town of Indian River Shores, portions of the unincorporated mainland adjacent to the city limits, and the unincorporated area of the barrier island south of the City of Vero Beach.

Located adjacent to the City of Vero Beach Municipal Airport, the City of Vero Beach Water Treatment Plant draws raw water from both the surficial aquifer and the Upper Floridan aquifer. Reverse Osmosis is used to treat water drawn from the Upper Floridan aquifer, while a lime softening treatment process is used for water drawn from the surficial aquifer.

City of Fellsmere Water System

The City of Fellsmere operates a small water system that serves the city’s residents. The city draws water from the surficial aquifer.

Summary of Public Potable Water Systems

The county’s public Potable Water Systems’ characteristics are identified in Table 3.B.2.

TABLE 3.B.2
INDIAN RIVER COUNTY POTABLE WATER SYSTEM, PUBLICLY OWNED PLANTS

WATER PLANT	WATER SOURCE	TREATMENT METHOD	SERVICE AREA	2006 DEMAND IN MGD	2006 DESIGN CAPACITY IN MGP	2030 DESIGN CAPACITY IN MGD
SOUTH COUNTY	Upper Floridan aquifer	Reverse Osmosis	SE Mainland, SR 60 Corridor	6.0	7.50	12.87
NORTH COUNTY	Upper Floridan aquifer	Reverse Osmosis	Central and North Mainland, Sebastian, Orchid, north portion of IRS	3.5	3.5	7.50
VERO BEACH	Surficial & Upper Floridan aquifers	Reverse Osmosis & Lime softening	Vero Beach, Indian River Shores, South Beach	6.2	12.0	12.0
CITY OF FELLSMERE	Suficial aquifers	Lime softening	City of Fellsmere	.29	.65	3.85
TOTAL				15.99	23.65	36.22

FRANCHISED WATER SYSTEMS

In addition to the county's public potable water treatment facilities, there are three private franchised systems which also provide potable water to portions of the unincorporated county. By agreement with Indian River County, the franchised systems are permitted to serve a specified geographic area of the county. The area that a franchised system serves may be larger than a single development project.

With the exception of the Fellsmere Management Corporation operated plant at the Fellsmere Trailer Park, each of the franchised water plants will eventually be decommissioned, and their customers will be connected to the regional system. Because it serves an area outside of the county's urban service area, the plant at the Fellsmere Trailer Park will not be decommissioned.

Table 3.B.3 lists the existing franchised water systems and gives their treatment method, source of water, and design capacity.

TABLE 3.B.3.
WATER FRANCHISE FACILITIES IN INDIAN RIVER COUNTY

FRANCHISE	TREATMENT METHOD	SOURCE OF WATER	DESIGN CAPACITY
Sun Agriculture Facility	Chlorination	Surficial aquifer	575,000 GPD
Countryside	Reverse Osmosis	Upper Floridan aquifer	85,000 GPD
Fellsmere Management Corp.	Aeration and Chlorination	Surficial aquifer	115,000 GPD

Source: Indian River County Utilities Department

PRIVATE WELLS

Currently, there are approximately 17,000 private potable water wells within the unincorporated portion of Indian River County. These wells serve residential and non-residential land uses. Generally, private wells are designed to serve single land uses; therefore, distribution is limited to the site of a residence or other land use. Approximately 310 new private potable water wells are established annually within the unincorporated county.

Presently, the Indian River County Environmental Health Department (IRCHD) requires a minimum separation of 75 feet between wells and septic tanks. For new lots utilizing well and septic tank systems, the IRCHD requires that the lots be a minimum of ½ acre in size (approximately 20,000 square feet). If a lot is served by a public water system and a septic tank, the size of the lot may be reduced to ¼ acre in size (approximately 10,000 square feet).

Private wells within the county use both the surficial aquifer and the Upper Floridan aquifer as sources of water. Approximately 95% of all wells within the unincorporated county, however, use the surficial aquifer as their source of water. On the mainland, private residential and commercial/industrial wells primarily use the surficial aquifer as their source of water. On the barrier island, both the Upper Floridan aquifer and the surficial aquifer are important sources of water for private residential wells. Generally, private well systems treat surficial aquifer water with ion-exchange water softening and filtration processes.

BRINE DISPOSAL

Presently, the county is working with the state Department of Environmental Protection to redirect the brine by-product from the north county water treatment plant into the Grand Harbor Spoonbill Marsh Site. The Spoonbill Marsh site is generally located on the west shore of the Indian River Lagoon, south of 63rd Street. At this site, the brine water will be mixed with brackish water from the Indian River Lagoon and further treated through a saltwater marsh treatment system prior to flowing into the Lagoon. This high marsh site is expected to further remove suspended solids, phosphorous and nitrogen through evapotranspiration prior to the brine flowing into the Indian River Lagoon. The brine by-product from the south county water treatment plan is currently discharged into the South Relief Canal.

STANDARDS

Water demand can be expressed in terms of gallons per capita per day or in terms of gallons per dwelling unit per day. Each day, the average county resident consumes approximately 104 gallons of potable water.

Table 3.B.4 identifies historical water demand per dwelling unit. These data were reported in records obtained from the County Utilities Department and General Development Utilities, Inc.

TABLE 3.B.4
INDIAN RIVER COUNTY
HISTORICAL AVERAGE WATER DEMAND PER DWELLING UNIT

YEAR	AREA	SINGLE-FAMILY	MULTI-FAMILY
1983	North County	197 GPD/Unit	236 GPD/Unit
	South County	172 GPD/Unit	94 GPD/Unit
1984	North County	204 GPD/Unit	204 GPD/Unit
	South County	170 GPD/Unit	95 GPD/Unit
1985	North County	208 GPD/Unit	187 GPD/Unit
	South County	182 GPD/Unit	108 GPD/Unit
1986	North County	211 GPD/Unit	170 GPD/Unit
	South County	200 GPD/Unit	100 GPD/Unit
1996	Countywide	234 GPD/Unit	234 GPD/Unit

Source: Indian River County Water System Master Plan

With respect to infrastructure planning, an important consideration is level of service. Generally, a Level of Service standard is an indicator of the degree of service provided by, or proposed to be provided by, a facility based on the operational characteristics of the facility. For water usage, the Level of Service provides the basis for determining the design capacity of a potable water system, including treatment capacity, storage capacity, and the capacity of high service pump stations. Calculation of future demand, projection of required plant capacity, and estimation of the need for future expansion are based on the established level of service.

Based on the historical demand figures shown in Table 3.B.4, future levels of service by land use classifications were established. Table 3.B.5 shows the future level of service standards. While the residential level of service is based on the average daily demand from single-family and multiple-family units and is expressed in terms of gallons per day per unit, the demand for commercial/industrial water uses is expressed in terms of gallons per day per gross acre.

TABLE 3.B.5
 INDIAN RIVER COUNTY
 FUTURE POTABLE WATER LEVEL OF SERVICE STANDARDS

Single-Family (gal./dwelling unit/day)	Multiple-Family (gal./dwelling unit/day)	Commercial/Industrial (gal./gross ac./day)
250	250	2,500

Source: Indian River County Utilities Department

To account for the larger volumes of water typically used in modern residential and commercial developments, these Levels of Service exceed historical consumption amounts. Generally, the historical data reflect water usage in the older areas of the county. Many of those homes were not equipped with modern water using appliances (such as dishwashers, garbage disposals, etc.) and had smaller lawns to irrigate, compared to more recently developed residential areas. The historical data also reflect the relatively large percentage of vacancies characteristic of multi-family units. This results from the seasonal fluctuations that some areas of the county experience. In the future, the county projects that a larger percentage of homes will be occupied permanently.

Even though multi-family units have fewer people per unit, most new multi-family developments generally have larger green areas and, in some cases, golf courses. As a result, the Utilities Department uses the same level of service for both single-family and multi-family units. In the future, the county's intent is to reduce water consumption by implementing strong conservation measures. Consequently, this may result in lower demand projections and different plant capacity assessments.

Besides the factors referenced above, other level of service standard considerations are as follows:

- Wellfield capacity must be based on average daily use plus the added volume that would be needed if the largest well in the system were out of service;
- Storage tank capacity must be at least ½ of the average daily consumption volume;
- High service pump capacity with redundant pumps must be at least equal to maximum daily demand;
- Pressures for high service pump stations must be a minimum of 40 PSI during peak flows;
- At fire flow conditions, the system must be able to provide a delivery pressure of 20 PSI; and

- Water quality must meet EPA and State of Florida safe drinking water requirements.

For tracking purposes, the county Utilities Department uses 250 gallons per day (GPD) per equivalent residential unit (ERU) as the county's potable water level of service standard. Currently, the county's storage capacity is 13.5 million gallons, its minimum pressure is 40 PSI, and its minimum design flow is 500 gallons per minute.

REGULATORY FRAMEWORK

Potable water is a commodity which can affect the health of the community. Consequently, several governmental agencies regulate various aspects of the potable water system.

Table 3.B.6 shows the various federal, state and local agencies involved in the regulation and management of potable water and the function of each agency.

FEDERAL

The federal government has established minimum potable water quality standards. These regulations include operating standards and quality controls for public water systems. The regulations are incorporated in the Safe Drinking Water Act, Public Law 93-523. This law directs the Environmental Protection Agency (EPA) to establish minimum drinking water standards. EPA standards are divided into "primary" and "secondary" standards. "Primary" standards concern the health quality of the water, while "secondary" standards relate to the aesthetic quality of the water.

STATE

In accordance with federal government standards, the Florida Legislature adopted the Florida Safe Drinking Water Act, Section 403.850 - 403.864, FS. The Florida Department of Environmental Protection (DEP) is the state agency responsible for promulgating rules classifying and regulating public water systems. These regulations are incorporated within Chapter 62-550, FAC. The primary and secondary standards of the Federal Safe Drinking Water Act are mandatory in Florida.

The St. Johns River Water Management District is responsible for managing water sources to ensure that those sources can meet existing and future demands. To manage consumptive use of water resources, the district has established a permitting system by which water resources are allocated among permitted consumers. The St. Johns River Water Management District rules applicable to Indian River County are contained in 40C-2, FAC, and 40C-3, FAC,

LOCAL

While Indian River County, the City of Fellsmere, and the City of Vero Beach are the local governments responsible for providing centralized potable water in Indian River County, the County Utilities Department is responsible for managing the county's water system. The County Utilities Department is responsible for the following activities:

- planning new water treatment plants and expansions to existing treatment plants;
- operating and maintaining existing water treatment plants; and
- regulating the development of private water treatment plants.

TABLE 3.B.6
REGULATION OF POTABLE WATER

AGENCY	STATUTORY AUTHORITY	SCOPE	ACTIVITY
Department of Environmental Protection	Chapter 403, FS Rule 62-550, FAC	Primary regulatory agency for public water systems exceeding 2000 GPD to include community/ non-community supplies.	Mostly review & permitting; Delegates authority to state & regional agencies.
State Public Health Unit	Chapter 403, FS Chapter 381, FS Rule 17-22, FAC Rule 64E-8, FAC	Regulates all water systems, including private systems, not covered by the "Florida Safe Drinking Water Act".	Inspection, enforcement, & testing; Issues permits for systems under 2000 GPD; Investigates all drinking water complaints.
St. Johns River Water Management District	Rule 40C-2, FAC Rule 40C-3, FAC	Reviews construction of all wells including public water systems.	Issues well construction permits, & consumptive use permits.
County	Local Ordinance Home Rule	Reviews all utility construction; Constructs & maintains county's public water system; Regulates local franchise service.	Issues utility construction permits; Inspects work on public systems.

Source: Indian River County Health Department

ANALYSIS

This analysis section addresses future potable water demand and focuses on the three components of the potable water system. Those are: water sources (supply), treatment, and distribution.

PROJECTION OF FUTURE DEMAND

Assumptions

The comprehensive planning process is an opportunity for the county to complete an assessment of its long range potable water needs. Any such projection of future potable water needs, however, must be more than a simple linear projection. Instead, future projections should utilize certain assumptions based on past trends, present conditions, and future desires. The principal assumptions utilized in this section are as follows:

- The county will be the primary provider of potable water service to the unincorporated county, the City of Sebastian, and the Town of Orchid;
- The City of Vero Beach will continue to serve the City of Vero Beach, the Town of Indian River Shores and a portion of the unincorporated county; and
- More than 95% of future new developments will connect to the regional potable water system.

Methodology

Table 3.B.2 in the existing conditions section of this sub-element identifies the existing capacity of publicly owned water treatment plants. That section of this sub-element addresses the supply side of the potable water system. This section considers the demand side.

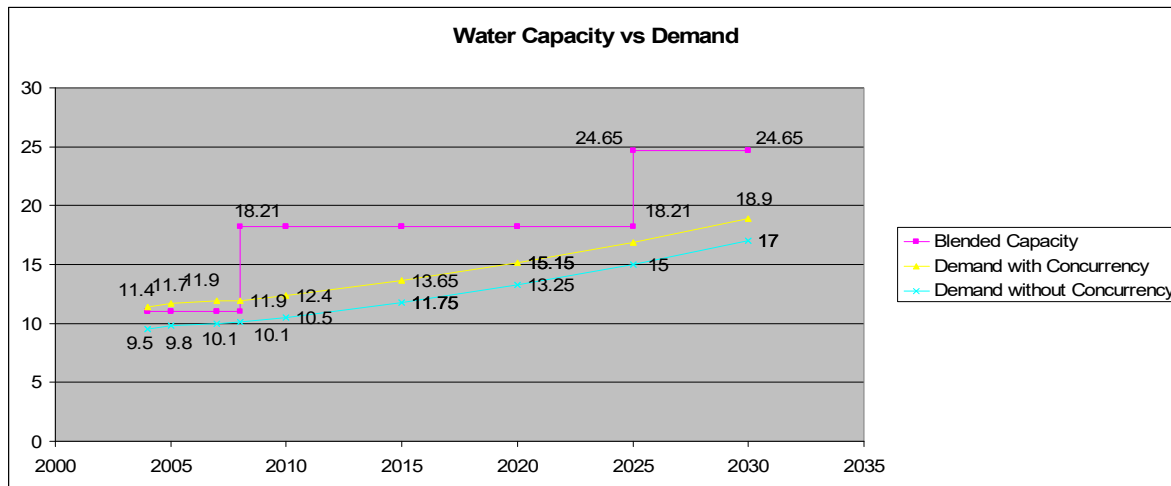
The information for this section is based on the permanent and functional population projections contained in the Introductory Element and on the projected land use patterns contained in the Future Land Use Element. These projections are also consistent with the county utilities master plan, including its December 2004 update. To develop these projections, the county used data such as historic growth, population projections, number and type of dwelling units, and developed commercial/industrial acreage.

Overall, planning for water plant expansions requires a rational approach to projecting growth over a finite planning period. Past experience has shown that using the historic growth of existing facilities in conjunction with population projections is the most accurate method of projecting potable water demand and future water plant expansion needs.

To meet current and future demand, the county has in the past implemented all potable water capital improvements identified in the county’s potable water sub-element. In the future, additional capital improvement projects will need to be undertaken. These include the extension of main water distribution lines, the expansion of treatment capacity, the construction of reuse water lines, the construction of infrastructure associated with the alternative water supply facilities and the construction of new intake surface water lines.

As shown in the graph below, total 2030 potable water demand in the county will be 18.90 million gallons per day. At that time, the projected capacity of the county’s water treatment plants, based on the county’s potable water master plan, will be 24.65 million gallons per day. To achieve the 24.65 mgd capacity by 2030, the county completed a potable water plant expansion in 2008 and plans to undertake another expansion in 2025. While the 2008 water plant expansion was 7.18 mgd, the 2025 expansion will be 6.44 mgd. These are shown in the chart below.

Figure 3.B.2



Presently, the County Utilities Department has a Consumptive Use Permit from the SJRWMD that allows a maximum Upper Floridan aquifer withdrawal of 13.79 million gallons per day by the year 2021. This permitted amount of water withdrawal is significantly less than the projected demand for that same time period. To remedy this situation, the County Utilities Department recently applied to SJRWMD for 3 additional wells at the north county water plant and is applying for a revised Consumptive Use Permit to allow more Upper Floridan aquifer water withdrawals to meet projected demand.

In response to the county’s request, the SJRWMD recommended that the county install 6 new wells. The district has indicated that the 6 wells will be permitted at a withdrawal rate lower than the 3 requested wells, and that dispersing the wells with a low withdrawal rate per well over a large area

around the north county treatment plant will reduce the impact of water withdrawals from the Upper Floridan aquifer in the immediate area of the treatment plant.

As indicated, recent plant expansion and the pending consumptive use permit application provide enough capacity to accommodate projected 2025 demand. To address unanticipated deficiencies and thus ensure sufficient capacity through 2030, however, the county must begin planning for capacity expansion in a timely manner. Accordingly, the county must consider not only when demand will occur, but also the amount of time needed to design, permit, and construct a potable water treatment plant or plant expansion.

Because those factors directly relate to the size of the expansion and other variables, predicting such timeframes with a high degree of accuracy is difficult. Nevertheless, a typical 1.0 MGD expansion generally requires 1.5 to 2 years for design and permitting, and 1.5 to 2 years for construction. To ensure sufficient capacity through the planning time horizon, the county should take the following steps:

- begin planning and preliminary design for expansion when a plant's Average Daily Demand is projected to equal or exceed its capacity within 5 years;
- prepare plans and specifications for expansion when a plant's Average Daily Demand is projected to equal or exceed its capacity within 4 years;
- submit a complete construction permit application to the Florida Department of Environmental Protection for expansion when a plant's Average Daily Demand is projected to equal or exceed its capacity within 3 years; and
- submit an application for an operation permit for the expanded facility to DEP when a plant's Average Daily Demand is projected to equal or exceed its capacity within 6 months.

Taking these steps within the referenced timeframes will ensure that the county has sufficient time to design, permit, and construct needed plant capacity. At the same time, these timeframes decrease the chances that plants will have many years of unused capacity. Finally, these procedures are consistent with provisions of the Florida Administrative Code.

WATER SOURCES (SUPPLY)

Indian River County has two principal potable water sources. Those are the Upper Floridan and the surficial aquifers. As indicated in the Natural Groundwater Aquifer Recharge Sub-Element, the need to conserve water from these aquifers will increase as the county grows. Other issues relating to these aquifers are discussed in detail in the Natural Groundwater Aquifer Recharge Sub-Element.

Upper Floridan aquifer

Presently, the county potable water system receives its water supply from wells that have been installed into the Upper Floridan aquifer. Future county wells for both the south county plant and the north county plant will also tap the Upper Floridan aquifer. Due to geological conditions (the overlying Hawthorn Formation with its relatively low permeability), the Upper Floridan aquifer is less susceptible to contamination than the surficial aquifer.

Although the Upper Floridan aquifer yields greater volumes of water than the surficial aquifer, the Upper Floridan aquifer contains higher concentrations of impurities (chlorides in excess of 250 milligrams per liter). Because water from a typical Upper Floridan aquifer well exceeds acceptable limits for impurities, treatment by reverse osmosis is necessary to make the water potable. With proper management, however, the Upper Floridan aquifer should provide a long-term, reliable water source for Indian River County.

Surficial Aquifer

Compared to the Upper Floridan aquifer, the surficial aquifer has a greater potential of being impacted by contamination and is a smaller volume producer. Qualitywise, water in the surficial aquifer is variable throughout the county. Although surficial aquifer water is of a quality acceptable for domestic consumption with limited treatment, water from a typical surficial aquifer well is hard and requires softening.

Overall, the surficial aquifer is subject to several potential water quality problems. Among those problems are the following:

- Trihalomethanes (THM). THM is a carcinogenic chemical formed when free chloride, which is used for disinfection, combines with organic materials that naturally occur in groundwater. The Florida Department of Environmental Protection (FDEP) standard for THMs is 0.08 mg/l.
- Salt water intrusion. In an undisturbed state, natural discharge of an aquifer is sufficient to maintain the fresh water/salt water interface at or near the coastline. As water is withdrawn from the surficial aquifer in inland areas, however, this balance is disrupted. At high rates of groundwater extraction, the interface will move inland and contaminate fresh water zones with salt water.
- Contamination from pesticides, herbicides and industrial wastes. The potential for such contamination is high, since the surficial aquifer receives its recharge directly from the surface.

- Organic based contaminants. FDEP has established maximum contaminant levels for dozens of organic constituents. Because of the serious concern for organics in drinking water, the county has decided to avoid the use of the surficial aquifer.

Since the surficial aquifer is the principal potable water source for many of the 17,000 private wells in the county and because that aquifer is subject to the contamination problems identified above, many county residents are potentially subject to health problems from their potable water.

There are two principal ways to address this problem, and the county is currently doing both. As discussed in the Natural Groundwater Aquifer Recharge Sub-Element, the county is taking various actions to preserve the quantity and quality of the surficial aquifer. The other action which the county is taking to address the potential contamination problems with shallow wells is to expand the centralized potable water system throughout the urban service area, so that those residents who have surficial aquifer wells can connect. Because the centralized system uses the Upper Floridan aquifer as a water source and then treats the water, that water is usually better quality and safer for residents.

Public Water Supply

In 2005, the Florida Legislature enacted Senate Bills 360 and 444. That legislation significantly changed Chapters 163 and 373, F.S. to require coordination of water supply and land use planning. In so doing, the legislation strengthened the statutory linkage between regional water supply plans prepared by the state's water management districts and comprehensive plans prepared by local governments. Because Indian River County is included in the St. Johns River Water Management District's regional water supply plan, the county must coordinate with the district to assess future water needs.

With Senate bills 360 and 444, two sets of requirements were established, one set for jurisdictions subject to a regional water supply plan and one set for jurisdictions not subject to a water supply plan. While Indian River County is not subject to a regional water supply plan, the county wants to be proactive in identifying and utilizing alternative water supplies.

Alternative Water Supply

In 2003, the SJRWMD concluded that the UFA (Upper Upper Floridan aquifer) groundwater resources in Indian River County can sustain continued development through 2025. Beyond 2025, however, there may not be sufficient capacity in the UFA to sustain continued development. In 2009, the SJRWMD will complete a new water supply assessment. If that assessment indicates that the UFA cannot sustain proposed withdrawals through 2030, then the County will be identified as a priority water resource caution area and will become a focus of the next District (SJRWMD) Water Supply Plan.

To address the potential capacity issues with the UFA, Indian River County prepared a local Alternative Water Supply Master Plan in 2007. According to that plan, surface water may serve as

an alternative to, or as a supplement to, the Upper Floridan aquifer as the county's future potable water supply source. For surface water to be a practical alternative supply source, there needs to be a viable surface water storage system. Any such surface water storage system, however, would need to be created in coordination with the SJRWMD. Among its responsibilities, the district has been legislatively authorized to provide funding for alternative water supply projects. Besides planning for alternative water supply sources, the County Utilities Department is also analyzing water conservation and reuse programs.

In its 2007 Alternative Water Supply Master Plan, the county assessed the following three alternative sources of water supply:

- Surficial aquifer
- Seawater Desalination; and
- Fresh Surface Water/Reservoirs

Pros and Cons

The pros and cons associated with each of the three alternative water supply sources, as well as the Upper Floridan aquifer (UFA), are shown in the Table below for comparison purposes.

**Table 3.B.7
Pros and Cons Associated with Alternative Water Supplies**

	Surficial aquifer	Seawater/Boulder Zone Desalination	Fresh Surface Water/Reservoirs	Use of UFA
Pros	<ul style="list-style-type: none"> • Water is Available • Potentially lower cost than current water Treatment Technology • No anticipated impact on agricultural wells in the UFA 	<ul style="list-style-type: none"> • Unlimited water availability 	<ul style="list-style-type: none"> • Fresh surface water resources are abundant particularly at the boundary between the Upper Basin project and C-25 canal • O&M costs are the lowest of all technologies • Deep injection well not necessary • Fellsmere Water Management Area (WMA) slated for development 	<ul style="list-style-type: none"> • Groundwater is available • Ability to meet immediate and short term demands • Same treatment technology as currently in place • Costs are similar to existing costs • Add on to existing treatment plants • A secure source
Cons	<ul style="list-style-type: none"> • Different Membrane Treatment Technology • Deep injection well for disposal of brine • Production rates are low requiring a large number of wells • Land acquisition of large number of well sites • Potential Wellfield Protection issues because of shallowness of wells – will Require Protection • Variable water Quality • High maintenance • Potential impact on adjacent homeowner wells 	<ul style="list-style-type: none"> • Most expensive membrane treatment technology-energy intensive • Different membrane treatment technology • Deep injection well for disposal • If Boulder Zone is the source, then a study would be necessary to show feasibility • Potentially a secure source if groundwater is the source; surface water source would be less secure 	<ul style="list-style-type: none"> • Different membrane treatment technology • Approximately 20 miles of pipeline required • Safe yields of the St. Johns River and Upper Basin project have not yet been determined – minimum flows and levels in the St. Johns River must be met. • Operational guidelines for the water conservation areas will be a constraint on available supply • Timing of construction of Fellsmere WMA not determined • Reconnection of the C-25 canal and the Upper Basin project is still in the discussion stage. • Source water will require protection 	<ul style="list-style-type: none"> • Potential interference with existing agricultural wells • Deep injection well for disposal of concentrate • Extension of well sites over greater distances to minimize drawdown impacts increases pipeline costs

Alternative Water Supply Implementation Schedule

As indicated in the Table below, it will take a number of years to implement any of the water supply alternatives. In the table, the lower number of years represents the best case scenario, with the assumption that the necessary permits would be processed routinely and that controversy or objections would not delay the project. The higher number of years represents the time that would be required to address potential permitting delays. The potential delaying activities that could occur are shown in the referenced table. As indicated, the interim expanded use of the UFA is the alternative that would require the least number of years to implement.

**Table 3.B.8
Schedule for Implementation of Alternative Water Supplies**

	Surficial aquifer	Seawater Desalination	Fresh Surface Water/Reservoirs	Interim Expanded Use of UFA
Number of Years to Implement from Authorization	6 to 8	6 to 10	6 to 10	2 to 4
Potential delaying factors	<ul style="list-style-type: none"> Resolution of drawdown impacts on wells of adjacent home owners Groundwater quality protection Acquisition of large number of well sites 	<ul style="list-style-type: none"> 404 permitting for crossing of the Indian River Lagoon Feasibility study for use of the Boulder Zone as a source of water 	<ul style="list-style-type: none"> SJRWMD's determination of the safe yield of selected water storage areas Availability of water from the St. Johns River due to minimum flows and levels restrictions 	<ul style="list-style-type: none"> Resolution of drawdown impacts on nearby agricultural wells

Alternative Water Supply Costs

In the table below, the cost estimates for each of the three different alternative water supply sources are presented. For comparison purposes, the cost of constructing new water treatment plants and developing new UFA wellfields is also presented. No land acquisition costs are included in any of the cost estimates. In the case of seawater desalination, only the treatment cost is included. The cost of an influent pipeline extending to the ocean is not included because of significant uncertainties associated with this determination.

For the various potable water treatment technologies, treatment processes, and plant components, the estimates include capital, operation and maintenance (O&M), and total production costs. As shown, the cost estimates are provided for plant capacity increments of 5, 10, 15, and 20 million gallons per day (mgd) on a maximum day demand (MDD) basis. The table below presents a summary of the total production costs for each technology, including the annualized capital costs, the annual O&M costs

for each production rate case, and an annual renewal and replacement (R&R) fund deposit (which is not included under O&M costs).

Ranking of Alternative Water Sources

Although a strictly quantitative ranking of the alternative water supply options is not possible, it is possible to make practical judgments regarding the three alternatives. While all three alternative water supply sources are positive with respect to water availability, all three possess uncertainties and some level of risk. All three differ in cost, some significantly. While implementation schedules are similar, the implementation timeframe for any of the three would be a number of years.

At this point, seawater desalination is the least desirable alternative, because it is the most expensive technology and the most energy intensive. As an alternative to seawater, saline groundwater from the Boulder Zone may be feasible, but confirmation of this would be subject to a feasibility study that examines use of the Boulder Zone as a water source.

As a potable water supply alternative, the surficial aquifer presents some difficulties related to water quantity protection, since all of the wells would be very shallow with the most productive zones in the central part of the County in the upper 50 feet of the aquifer. Water quality variability is also an issue. Because of low productivity, the surficial aquifer would require a large number of small wells producing small quantities of water. In addition, the impacts on adjacent users of the surficial aquifer could put the County in the same position as expanded use of the UFA with respect to agricultural wells. In the past, the County decided against using this source and elected to go to the UFA.

Table 3.B.9
Summary of Probable Cost for Treatment Technologies Using Various Raw Water Sources

Raw Water Source! Treatment Method! Plant Capacity (mgd)	Raw Water Source	Concentrate Disposal	Capital Cost	Annual O&M Cost	Production Cost (\$/1000 gallons) ⁴
Current Costs of UFA Using Low Pressure RO - Actual Costs (FY 2007-2008)					
13.61 ¹	Groundwater	Surface Water Discharge	\$30,000,000	\$5,102,572	\$2.05
Fresh Surface Water Using Microfiltration/Ultra filtration					
5	Surface Water	N/A ²	\$14,191,000	\$1,078,000	\$2.10
10	Surface Water	N/A ²	\$24,397,000	\$1,720,000	\$1.57
15	Surface Water	N/A ²	\$33,064,000	\$2,289,000	\$1.36
20	Surface Water	N/A ²	\$41,025,000	\$2,841,000	\$1.22
Surficial Aquifer Using Nanofiltration					
5	Groundwater	Deep Injection Well (DIW)	\$24,178,000	\$1,646,000	\$3.42
10	Groundwater	DIW	\$33,576,000	\$2,836,000	\$2.34
15	Groundwater	DIW	\$41,573,000	\$3,913,000	\$1.95
20	Groundwater	DIW	\$50,188,000	\$4,992,000	\$1.75
Continued Use of UFA Using Low Pressure RO-New WTP and Wellfield					
5	Groundwater	DIW	\$34,693,000	\$1,758,000	\$4.41
10	Groundwater	DIW	\$48,579,000	\$3,181,000	\$3.04
15	Groundwater	DIW	\$64,086,000	\$4,526,000	\$2.65
20	Groundwater	DIW	\$79,077,000	\$5,910,000	\$2.42
Seawater RO Treatment					
5	Surface/ Ground Water ³	DIW	\$39,429,000	\$3,145,000	\$5.95
10	Surface/Ground Water ³	DIW	\$64,094,000	\$6,230,000	\$4.77
15	Surface/Ground Water ³	DIW	\$92,828,000	\$9,248,000	\$4.48
20	Surface/Ground Water ³	DIW	\$115,436,000	\$12,432,000	\$4.18

¹13.61 mgd is new WTP capacity expansion at north county RO plant; actual average production for the FY2008-2009 is projected to be 8.89 mgd. Production cost based on actual average production estimate of 8.89 mgd (3,246 mgy)

²MF/UF do not produce a concentrate stream as with nanofiltration and RO systems. Residuals need to be removed from the backwash water and chemicals in the backwash solution may require neutralization prior to disposal.

³Costs include only treatment. Cost of an influent pipeline or deep well to the Boulder Zone as a source is not included. Deep Injection Well disposal would vary between \$5.5 million and \$11 million for the water treatment plant capacities presented. ⁴Annual O&M and production costs are based on average daily demand using a maximum daily demand/annual average daily demand ratio.

As a future long-range source of potable water, surface water located in western Indian River

County represents a good first choice. In the western part of the county, surface water resources appear to be abundant, and treatment would not be as energy intensive as other technologies. After the initial construction of approximately 20 miles of pipeline that may cost from \$10 million to \$20 million, the operating costs would be low. Currently, the SJRWMD is evaluating the availability of water from the St. Johns River. This evaluation will assess minimum flows and levels, and will determine water availability in the District's existing and proposed water management areas.

Preliminary analysis has shown that a significant amount of water is available in the C-25 canal basin and the adjacent Upper St. Johns basin. This water is currently discharged to tide. Recently, the SFWMD and the SJRWMD initiated discussions regarding construction of a reservoir in the area to capture currently wasted water. In addition, the proposed 10,000-acre Fellsmere Water Management Area (FWMA) is a potential significant additional source of fresh surface water.

Prior to the county choosing surface water as an alternative water source, however, the SJRWMD will need to commit to the permissibility of fresh surface water in western Indian River County. To determine the optimum location for withdrawals and ensure a sustainable withdrawal even during dry/drought periods, a great deal of coordination with the SJRWMD will be necessary. In addition, the use of an Aquifer Storage and Recovery system may be necessary to ensure dry season water availability.

In terms of water supply, the UFA will continue to be the county's water supply source until an alternative water supply source, such as surface water, can come on-line. A conservative estimate of when an alternative water supply such as surface water could be on line is 2018. Given that this is the case, an interim expansion of withdrawals from the UFA will be necessary.

In 2018, raw water withdrawal is projected to be approximately 17.10 mgd. While current wellfield capacity is approximately 15.5 mgd (based on six wells at South County and three wells at North County), the current North County RO plant expansion will increase the county's potable water capacity to 18.21 mgd.

Water Supply Plan

Because Indian River County is not currently in a SJRWMD Priority Water Resource Caution Area, the county is not required to complete a 10 year water supply facilities work plan at this time. Even though the county is not currently required to develop a water supply facilities work plan, the county is and has been proactive in identifying and working toward establishing an alternative water supply source. For that reason, the county is coordinating with SJRWMD in the district's water supply assessment and in its water supply development-related initiatives that affect the county.

According to the county's alternative water supply analysis, in a best case scenario a new water supply source could not be on line until 2018. That timeframe could be even longer if a surface water reservoir needs to be constructed. Given these constraints, another existing surface water alternative may be a better choice. That is to utilize water from the C-54 Canal. Regardless, the

county will need to continue to utilize the UFA as a source to bridge the gap until the new source can be developed.

Overall, the C-54 strategy could be the most cost effective because the county would continue to utilize existing treatment plant technology and facilities even with surface water as a public water supply source. At such time as a new potable water supply source comes on line, the withdrawals from the UFA could be reduced and used as a reserve source, if that is feasible.

Accordingly, the county's policy should be to:

- Continue using the UFA as an interim water supply source until such time as a surface water supply source can be brought on line.
- Coordinate with the SJRWMD to obtain authorization to utilize surface water from the District's existing water management and conservation areas. Specific target sources, water availability, permitting requirements, and pipeline routes should be addressed. Requirements for feasibility studies should be determined as required by the SJRWMD. If the source is a new reservoir, then ownership of the reservoir, costs of land, and financing should be addressed.
- Develop a preliminary schedule that addresses the annual steps needed to develop a new surface water supply by 2026.

TREATMENT

Treatment is a major part of the principal potable water system. Overall, water treatment issues relate to water quality and treatment plant capacity.

Water Quality

Because the county has been successful in decommissioning private treatment plants and connecting those customers to the regional system, the county does not have a private treatment plant problem. Regardless, the county does need to continue its efforts to decommission the remaining private plants.

With the county system, there are no quality nor quantity problems. As with all utility systems, water quality in the county system is regularly monitored and exceeds minimum standards. From a quantity perspective, the county system currently has sufficient capacity to serve its existing customer base. An important consideration, however, is that adequate treatment capacity be available to accommodate the demands of future growth and development.

In the last decade, there has been a significant increase in the number of potable water customers in the county and also a significant increase in per capita water usage. From 1995 to 2006, per capita/per day potable water use rose 40%. This could be due to any number of reasons. One such reason could be an increase in the number of homes, subdivisions, and commercial developments using potable water for irrigation purposes. According to the county utilities department, at least 50% of all water usage is attributed to irrigation. Another reason could be the increase in the number of residential units with swimming pools. Also, the increase in water usage may be attributed to an increase in the number of commercial and industrial users in the county since 1995.

Currently, the county's potable water system meets all federal and state regulations for safe drinking water. To ensure that safe drinking water standards are maintained, the county performs regular testing of drinking water.

Although the county operated potable water system consistently provides clean safe potable water, there are some problems with private franchised water treatment plants and private wells. Generally, these problems relate to the quality of raw water and the efficiency of the water treatment process. Those problems are summarized as follows:

- lower quality of treatment compared to regional water treatment plants and higher risk of groundwater contamination
- lack of funds and interest on the part of private plant owners to upgrade, maintain, and retrofit facilities
- age of treatment plants and frequent breakdowns
- lack of centralized control
- cost and insufficiency of the monitoring process
- problems with operation and maintenance (lack of experienced personnel to operate all the private plants)

Brine Discharge

At present, the County Utilities Department is implementing the Spoonbill Marsh initiative, an innovative project that will treat brine from the North County RO plant in a coastal marsh system and reduce impacts on the lagoon. This project is being undertaken because FDEP would not renew the county's permit to discharge brine directly into the lagoon. Although brine from the North County water plant will soon be treated in a coastal marsh system, brine from the south county RO plant will continue to be discharged into the south relief canal. The county is presently exploring alternatives, including mixing concentrate with stormwater and reclaimed water for irrigation, for

disposing concentrate from the South County RO plant.

Currently, the county is under a consent order from FDEP to relocate concentrate out of south relief canal within two years. To achieve that reduction, the county will need to consider several options for south county brine disposal. These options are: creating another marsh treatment system, establishing a county deep well injection system, mixing brine with reuse water, or entering into a partnership with the City of Vero Beach for deep well injection in the city's deep wells. Given the probability of the county having to address the South County R.O. plant brine discharge, the county should evaluate each of the referenced options.

Water Conservation

Generally, an increase in per capita potable water use is not a good trend. Such an increase could deplete water supply sources faster. To conserve water supply sources, the county needs to ensure that water is used more efficiently. One way to do that is to emphasize use of reclaimed water and treated stormwater for irrigation purposes. If more stormwater is retained on development sites and used for irrigation, groundwater supplies will be recharged, and stormwater flows to surface waterbodies will be reduced. In conjunction with common water conservation practices, utilizing stormwater and reclaimed water for irrigation purposes will enhance water resource preservation.

Recently, the St. Johns River Water Management District established a water conservation program called Florida Water Star. This program focuses on new residential construction and is intended to provide water-efficient options for homes and landscaping. This is a voluntary program that home builders may participate in. Since this program can enhance water conservation efforts, the county should encourage home builders to participate in the program. In so doing, the county should provide builders an incentive to participate in the Florida Water Star Program by expediting permit reviews for participating builders.

Private Plants

As indicated in the background section of this Sub-Element, the reason that the county started providing potable water services was due to problems at private treatment plants. In many cases, the problems with private plants were due to the operational aspects of the plants, rather than with the plants themselves. Because of those problems and their environmental impacts, the County Utilities Department has decommissioned 26 private plants. When those private plants were decommissioned, the former customers of those plants were connected to the county system. Currently, only three private plants continue to operate.

To avoid a repeat of past problems, to ensure the financial viability of the regional system, and to discourage urban sprawl, new private plants are generally prohibited within the urban service area. Consistent with provisions of the Future Land Use Element of this plan, private plants may be

allowed outside of the urban service area to serve development projects that meet specific criteria for the following:

- clustering of residential development within agricultural areas;
- clustering of residential development within privately owned upland conservation areas;
- clustering development within mixed use districts; or
- traditional neighborhood design communities.
- new towns.

The three existing private plants are the Fellsmere Management Corporation Plant, the Countryside Mobile Home Park, and the Sun Agriculture Facility. Currently, the county is working on connecting the Countryside north mobile home park to the regional system. While the Fellsmere Trailer Park plant, which serves the Fellsmere area, will continue operation, the other plants will eventually be decommissioned, and their customers will be connected to the county system. In the long term, the county's policy is to serve all areas with a centralized potable water system.

DISTRIBUTION

Another important component of the potable water system is water distribution. With its network of pipes, mains, and tanks, the distribution component of the regional potable water system must be able to serve existing and future development. For this to occur, further expansions to the existing distribution network within certain parts of the urban service area are needed.

The principal components of the potable water distribution system are pipes and pump stations. Because Indian River County has a relatively new potable water system, those pipes and pump stations are generally in good condition. Overall, the major lines are in place and are sized to accommodate future growth.

The county's overall plan for growth and development is reflected in the Future Land Use Element of the comprehensive plan. That element defines where the community will grow and where growth will be limited. As indicated in the Future Land Use Element, the urban service area is the area deemed appropriate for future urban type development. Accordingly, it is within the urban service area that utility lines and other infrastructure components will be available.

Although potable water service should generally be limited to lands within the urban service area, the county has allowed sites contiguous to the urban service area boundary to connect to the regional potable water system, and that is appropriate.

There are also other types of development allowed outside the urban service area, where potable water service is appropriate and in some cases necessary. These include clustered development in agricultural planned development projects, new town projects, traditional neighborhood design projects, agricultural businesses, and agricultural industries. For these uses, the county should allow

connection to the public water system or construction of a privately owned system, where connection to the public system is not feasible. In those cases where a privately owned system is allowed, the county should require that a franchise be obtained from the county and that any plants and distribution systems be built to county standards and, where deemed appropriate by the county, be dedicated to the county without compensation.

The major distribution system issues include service area, system evaluation and maintenance, system expansion to serve areas presently served by private wells, and system expansion to serve new development.

Service Area

Although the potable water service areas for the county and the City of Vero Beach have been set for many years, recent events have initiated interest in reconsideration of those service areas. Of particular concern are the unincorporated areas and the Town of Indian River Shores served by the City of Vero Beach.

Currently, Vero Beach serves those areas outside its corporate limits based on interlocal agreements with the Town of Indian River Shores and the county. While those agreements expire in 2016 and 2017 respectively, the county and/or Town must provide notice to the City by 2012 if either the county or the Town wants to terminate its agreement on the 2017 termination date.

In the past, neither the county nor the Town had considered terminating its service area agreement with the City. Recently, however, the City indicated that water and sewer rates would increase significantly in the next few years. Besides the rate increases, the lack of representation in City utilities rate setting is also a concern for unincorporated county and Town residents. Unlike city residents, customers living outside the city limits cannot vote in city council elections and therefore have no representation on utility matters.

For the reasons outlined above, the county's policy should be to maintain a dialogue with the City and the Town regarding utility service areas and to initiate a study to assess the financial feasibility of consolidating utility services or terminating the City of Vero Beach service area agreement in 2017. That study should address the costs and revenues associated with consolidating utility services or absorbing city utility customers in the unincorporated area and the Town into the county system.

Potable Water Need and Land Use

With the 1990 adoption of the comprehensive plan, the county established its urban service area. The intent of the comprehensive plan is to direct most growth into that area and to provide urban type services to development in that area.

Since 1990, there have been two significant changes regarding the provision of potable water. The first change has been the substantial increase in the customers served by centralized potable water systems. The second change is the reduction in the number of private water treatment plants operating in the county.

Over the last twenty years, the county's potable water system has expanded and now serves all urbanized areas of the county, including major commercial and industrial nodes. With that expansion, the county's potable water system adequately met the potable water demand from new residential and nonresidential developments. There are, however, some existing residential developments with undersized lots that are not connected to the county potable water system.

While the county's primary concern regarding the distribution of potable water relates to the expansion of the network to accommodate growth, a secondary concern is to eliminate potential health risks. Among the principal sources of potential health risks are residential subdivisions with "undersized" lots. Generally, wells associated with undersized lots have a greater risk of contamination. This problem is due to inadequate separation between septic tank drainfields and wells. Without adequate separation, the potential of contamination from septic tanks seeping into wells is greatly increased. Thus, potable water wells on undersized lots are susceptible to contamination.

In 2006, 30,402, or 63%, of the existing 48,188 residential units in the unincorporated area of the county, were connected to the county's potable water supply system. Consistent with the county's potable water master plan, the potable water system will be expanded within the USA in the future. This expansion will involve providing service to subdivisions with undersized lots.

Between 1995 and 2006, 22 subdivisions with undersized lots were connected to the county potable water system. In most of these cases, the cost of connecting those subdivisions to the regional potable water system was funded through assessments paid by the property owners benefiting from the expansion.

A review of the county utilities department's assessment projects indicates that most residents of existing unconnected residential subdivisions would like to be connected to the county potable water system, but they are not willing or able to pay for the connection. In the past, the county utilized Community Development Block Grants (CDBG) to connect several low income neighborhoods in the Wabasso area to the county potable water system. The CDBG program, however, is a competitive funding source and is available only to low and moderate income neighborhoods. In the future, the county may, whenever the opportunity becomes available, apply for CDBG or other federal or state grants to connect homes in existing residential neighborhoods to the county potable water system.

As indicated by recent land use and development patterns, the county has been successful at directing growth, both residential and non-residential, into the urban service area. The county has also expanded centralized potable water service within the urban service area. From 1990 to 2008, expansion of the county's water service was extensive in terms of the increased geographic area served and in terms of new customers. During that period, water customers increased by 137% (from 17,000 to 40,300 customers). Due to the extension of water lines, centralized potable water service is now available to most of the urban part of the county, and 94 out of 183 subdivisions having lots which are "undersized" are now served by a centralized potable water system.

According to current county land development regulations, each new subdivision within the urban service area is required to connect to the regional water system if the development meets criteria contained in the Water and Wastewater Connection Matrix for New Development. That matrix states that, for subdivisions, connection is required if the development meets either of the following criteria.

- It is within one-quarter of a mile of existing water lines; or
- It contains 25 or more lots.

Currently, the county's regional potable water system serves commercial/industrial development as well as residential development. Since plan adoption, the regional potable water system has been expanded to all commercial/industrial areas in the county, including the three I-95 commercial/industrial nodes. As a result of that expansion, the development potential of land within the Urban Service Area has greatly increased for both residential and commercial/industrial projects.

Although the regional potable water system service area has been greatly expanded, there are still several areas not yet served. Those areas include more than 100 residential subdivisions, some of which are not suitable for individual wells on each lot. For that reason, additional expansion of the system within the urban service area is planned. Included in these areas are Vero Lake Estates; parts of Roseland, Wabasso, Winter Beach; and other areas.

In the future, expansion priority should be given to subdivisions where the Indian River County Health Department has determined that the risk of private wells becoming contaminated is unacceptably high. Several factors should be considered when making that determination. First, existing development using contaminated wells should be given the highest priority for connection to the regional system. The next level of priority should be for existing development where the separation distance between wells and septic tank drainfields is insufficient.

Another factor that should be considered in establishing the potable water system's expansion priority is the development rate. To reduce the number of new wells which could become

contaminated, service to fast growing areas should be provided before service to slow growing areas. In so doing, service should be expanded in a contiguous, rather than “leap-frog”, manner.

Due to the increased risk of contamination associated with the use of private wells on undersized lots, the county should continue to expand the potable water distribution network to serve the subdivisions indicated in Table 3.B.10. Most of those subdivisions contain lots that are too small to accommodate the required 75 foot separation distance between potable water wells and septic tanks. For that reason, some lots cannot be developed. If those lots were connected to a centralized potable water system, however, then they could be developed.

TABLE 3.B.10
INDIAN RIVER COUNTY
SUBDIVISIONS HAVING UNDERSIZED LOTS & USING PRIVATE WELLS

1. Brumley Acres
2. Cadenhead
3. Charles Subdivision
4. Cherry Lane Manor
5. Cherrywood Estates
6. Citrus Gardens
7. Davilla Park
8. Durrance Development
9. Durrance Place
10. El Vero Villa
11. Ercildoune Heights
12. Fletchers Addition to Winter Beach
13. Forbes and Hamiltons Plat of Quay
14. Forbes and Hamiltons Revised Plat
15. Gallentine Subdivision
16. Gifford School Park
17. J. T. Gray's Town of Gifford
18. Granada Gardens Unit #1
19. Graves add. to Wabasso
20. Hardee Addition Subdivision
21. Hardee #2
22. Haven View
23. Haven View Addition #1
24. Hicks Subdivision
25. Hill Side
26. Hobart Estates
27. Indian River Acres
28. Indian River Highlands
29. Indrio Gardens
30. Inlet View
31. J.C. Acres
32. Jackson Brothers Subdivision
33. Jennings Addition to Quay
34. John W. Massey, Jr.
35. Karr
36. Kenilworth Estates
37. Laser Park 1
38. Mobile Villa Estates

39. Naranga Tract/Shellmound Beach
40. North Carolina Colony
41. Oak Lane Addition
42. Ocean Breeze Heights
43. Orchid Island
44. Orchid Isle Estates
45. Palm Gardens
46. Pine Lake Estates
47. Pine Metto Park
48. Pinson
49. Rivenbark Unit 2 (partially served)
50. Riverview (center condominium served)
51. A.G. Rose Addition
52. Roseland
53. Townsite of Roseland
54. Roseland Gardens
55. Roseland Lake
56. Sawyer Gardens
57. School Park Subdivision
58. Sebastian Grove Estates
59. South Moon Under
60. Sunniland Homesites
61. Tropicana Homesites
62. Vero Lake Estates
63. Vero Tropical Gardens Subdivision
64. Verona Estates
65. Vickers Subdivision
66. Wabasso Heights Replat
67. Wabasso Lows Park
68. Wabasso Manor
69. Wabasso Manor Addition
70. Wabasso Manor Replat
71. Wabasso Tourist Court
72. Town of Wauregan
73. Weona Park
74. Winter Beach Highlands
75. Winter Beach Park (52nd Avenue only served)
76. Winter Grove

Source: Indian River County Utilities Department

Funding Expansion/Capital Improvements

Being an enterprise operation, the County Utilities Department is financially self-sufficient, with no general tax money allocated for utility system capital or operational expenses. Revenues to pay for distribution system expansion are generated through impact fees, assessments, line extension fees, and developer's contributions. Thus, lines are paid for as they are expanded, and they are expanded in response to demand. Therefore, any extension of the water distribution network is funded primarily from revenue obtained from landowners who benefit from the extension.

Generally, capacity charges and line extension fees pay for the future capital expansions identified in the Potable Water System Master Plan. If there is a need for expansion of county utility infrastructure in an area sooner than the Utility Department's need assessment indicates, there must be some financial commitment from other sources. In some cases, the county can extend a line through an agreement between the County and a developer. This type of agreement requires the developer to provide for the extension of lines at a size meeting Master Plan needs with possible reimbursement provided in the future when other customers hook onto the system and pay applicable charges.

Once the main lines are in place, smaller lines branch off into developments and subdivisions. These smaller lines are funded by developers or with assessments. Through these methods, potable water service is provided to an area, and assessments are the responsibility of the benefitting landowners.

After an assessment line is installed, individual property owners can have a plumber connect their buildings to the system. Prior to receiving service, however, a property owner must pay any utility capacity charges, deposits, and meter installation fees. Utility capacity charges may be financed for up to 5 years. Through its local housing assistance program, the county can pay utility capacity charges for very low and low income households. The county can also use federal and state grants, such as Rural Economic and Community Development Program (formerly the Farmers Home Administration) Grants and Community Development Block Grants, to expand water service to areas with a high percentage of low and very low income households.

In the past, the county has acquired private water systems and incorporated them into its network. It is expected that this practice will continue in the future because private systems generally cannot provide the same level of service at reasonable costs that the county's centralized system can provide.

A list of potable water system capital improvements is provided in the Capital Improvements Element (CIE) of the county's comprehensive plan. Since the county's CIE must be updated annually, projects completed will be extracted from the list of capital improvements, and new

projects will be added as needed. The current Five Year Capital Improvements Plan for Potable Water and Sanitary Sewer is shown in Appendix A.

Almost all of the capital improvements needed for the 2025 expansion were included in the 2008 expansion. As part of the 2008 expansion, all of the 2025 needed wells, all of the 2025 needed membrane skids, and all but one of the 2025 needed membranes were put in place. Therefore, the only needed capital improvement for the 2025 expansion will be the addition of one membrane to an existing membrane skid. Since the county's water plants are interconnected, the utilities department has flexibility as to which plant is expanded to accommodate projected demand.

Service to New Development

The Utilities Department Master Plan identifies main lines that must be installed along major corridors. Unlike other distribution lines, "Master Plan" lines usually do not connect directly to a potable water user.

Besides the assessment process, another way to expand the distribution system is through platting and site plan approval requirements of new development. For example, current land development regulations mandate that each new subdivision within the Urban Service Area connect to the centralized potable water service system if the proposed subdivision meets either of the following criteria.

- It is within one-quarter of a mile of existing water lines; or
- It contains 25 or more lots.

For non-residential projects, only those located more than $\frac{1}{4}$ mile from the existing system and demanding less than 2,000 gallons per day are not required to connect to the regional system.

Those requirements must be maintained to ensure that expansion of the regional potable water system occurs in a logical manner and to ensure that the costs of system expansion are paid by the beneficiaries of the expansion. Even when a development project does not meet the above criteria, the project must connect to the regional potable water system if the project is deemed unacceptable for service by private wells due to increased health risks.

SUMMARY OF ANALYSIS

The county potable water system has sufficient existing and programmed capacity to accommodate Average Daily Demand through 2030.

Although the regional potable water system service area has been greatly expanded, there are still several areas not yet served. Included in these areas are most of Vero Lake Estates; parts of Roseland, Wabasso, Winter Beach, and other areas. Expansion priority should be given to subdivisions with undersized lots and areas where the Indian River County Health Department has determined that the lack of centralized potable water is a threat to residents' health.

Most importantly, the county needs to address future water supply issues. With its recent alternative water supply assessment, the county started that process. In the future, additional water supply initiatives will need to be undertaken.

GOAL, OBJECTIVES AND POLICIES

GOAL

Indian River County shall have an efficient potable water system that prevents degradation of existing resources, promotes orderly growth and development, and meets existing and projected demands.

OBJECTIVE 1 Service Concurrent with Development

Through the time horizon of the plan, there will be sufficient capacity in the regional potable water system to accommodate all new development within the urban service area.

POLICY 1.1: New development within the unincorporated portion of Indian River County shall be approved only when sufficient water supply capacity and potable water facility capacity are available, either on-site or off-site, to provide needed potable water service.

POLICY 1.2: The County Utilities Department, on an annual basis, shall inspect all private potable water plants in Indian River County.

POLICY 1.3: The county hereby adopts a potable water level of service standard of 250 gallons per day per equivalent residential unit of treatment capacity, a minimum design flow of 500 gallons per minute, a minimum storage capacity of 13.5 million gallons, and a minimum pressure of 40 PSI for potable water facilities.

POLICY 1.4: Through its computerized permit tracking system and its concurrency management system, the county shall continue to implement procedures to update facility demand and capacity information as development orders and permits are issued.

POLICY 1.5: The Utilities Department, on an as needed basis, shall provide summary reports containing capacity and demand information for each public potable water plant within the county service area.

POLICY 1.6: The county shall continue to allow the use of private wells in rural areas for single-family units and for small retail establishments. The use of private wells must be approved by the appropriate regulatory agencies and be consistent with the attached water and wastewater connection matrix.

POLICY 1.7: No development permit shall be issued by the county for projects to be served by the City of Vero Beach Utilities Department until the city notifies the county that

adequate water supplies and potable water facility capacity are available to accommodate the project.

OBJECTIVE 2 Regional System Expansion/Correction of Deficiencies

By 2030, at least 75% of all existing residential units in the county will be connected to a regional potable water system.

POLICY 2.1: The county shall continue to offer its utility line assessment program to areas with private wells within the County Utilities Department service area.

POLICY 2.2: The county shall continue to offer up to 10 year financing for all utility assessments.

POLICY 2.3: Within the County Utilities Department service area, the subdivisions having undersized lots and designated as requiring potable water service due to public health threats shall be given priority for the provision of public water service.

POLICY 2.4: The county shall provide potable water service to areas where the risk of private well contamination is determined by the Indian River County Environmental Health Department to be unacceptably high. The county shall recover costs through assessment of those landowners directly benefitting from the improvement.

POLICY 2.5: The County Utilities Department shall implement the potable water system programs and capital improvements identified in Appendix A of this element of the comprehensive plan.

POLICY 2.6: Prior to 2011, the County will coordinate with the City of Vero Beach and the Town of Indian River Shores to prepare a financial analysis of options related to the possibility of consolidation of utility services. This analysis may consist of, but is not limited to: the possibility of the County serving utilities to the Town of Indian River Shores, currently served by the City of Vero Beach and the Unincorporated area of the South Barrier Island, currently served by the City of Vero Beach, full consolidation of the City of Vero Beach Utility with the Indian River County Utility or making no changes in the existing utility service areas. Based on the results of a financial analysis of the various service options, the Board of County Commissioners will consider implementing the results that show the best financial and operational benefits.

OBJECTIVE 3 Potable Water and Groundwater Quality

Through the time horizon of the plan, the county potable water system will continue to meet the standards of the Federal Safe Drinking Water Act, Public Law 93-523; the Florida Safe Drinking Water Act, Section 403.850 - 403.864, FS; Chapter 381, FS; and Rules 62-550, 40C-2, 40C-3, 17-22, and 64E-8, FAC.

POLICY 3.1: The County shall continue to use the Upper Floridan aquifer as the primary source of potable water and use reverse osmosis as the principal raw water treatment method for its regional potable water system. With that water source and treatment method, the county will provide its customers with good quality water that meets the requirements of the Federal Safe Drinking Water Act, Public Law 93-523; the Florida Safe Drinking Water Act, Section 403.850 - 403.864, FS; Chapter 381, FS; and Rules 62-550, 40C-2, 40C-3, 17-22, and 64E-8, FAC.

POLICY 3.2: The county, through the Environmental Health Department, shall monitor and evaluate all private water treatment plants. The results of this evaluation shall be considered during the prioritization of potable water service expansion.

OBJECTIVE 4 Water Conservation

By 2020, the county's per capita water use will be less than the 2006 level of 104 gallons/day.

POLICY 4.1: The county shall require the use of irrigation quality (I.Q.) effluent meeting FDEP standards for irrigation in parks and facilities having significant open space areas (golf courses, medians, etc.) when those areas are located within the County Utilities Department service area and are within 1 mile of the nearest effluent reuse line. Reuse must be authorized by the appropriate regulatory agencies. When a project meets the above criteria, the developer shall be required to construct an effluent reuse line for treated wastewater to be used for spray irrigation.

POLICY 4.2: The county shall continue to apply the requirements of Chapter 926 of its land development regulations, which require the use of drought tolerant vegetation, the use of efficient irrigation systems, and the preservation of existing native vegetation.

POLICY 4.3: In order to eliminate irrigating during rain or when ground is saturated, irrigation systems at county facilities shall be either manually operated or utilize automatic systems with sensors.

POLICY 4.4: The county shall renew its annual contract with the SJRWMD to identify and require property owners to plug or valve free flowing artesian wells.

POLICY 4.5: The county shall encourage home builders to participate in the SJRWMD's Florida Water Star Program by expediting review of their permits.

POLICY 4.6: The county's water pricing system shall continue to be equitable, but shall continue to charge an exponentially increasing unit rate for high volume residential users (those using more than three times the Level of Service standard established in policy 1.3).

POLICY 4.7: To quickly and efficiently respond to any leakage, the county shall continue to implement its leak detection program.

POLICY 4.8: The county shall require all new subdivisions and projects of 25 or more lots/units that are within a ¼ mile of an effluent reuse line to connect to the effluent reuse line. When a project meets above criteria, developer shall be required to construct an effluent reuse line.

POLICY 4.9: By 2013, the Utilities Department shall review its current pricing plans to further discourage excessive water use and to provide incentives to customers for saving water.

POLICY 4.10: The county shall require new developments to use water from retention ponds, instead of water from wells, for irrigation.

OBJECTIVE 5 Capital Improvements

Throughout the time horizon of the plan, the county will have completed all programmed capital improvements shown in Appendix "A" of the Potable Water Sub-Element in order to maximize the use of existing facilities and discourage urban sprawl.

POLICY 5.1: In conformance with the review process for the Capital Improvements Element of this plan, the county shall maintain a five-year schedule of capital improvement needs for public facilities.

POLICY 5.2: Proposed capital improvement projects shall be evaluated and ranked according to the following priority level guidelines:

- Level One - whether the project is needed to protect public health and safety, to fulfill the county's legal commitment to provide facilities and services, or to preserve or achieve full use of existing facilities.
- Level Two - whether the project increases efficiency of use of existing facilities,

prevents or reduces future improvement costs, provides service to developed areas lacking full service or promotes in-fill development.

- Level Three - whether the project represents a logical extension of facilities and services within a designated service area

POLICY 5.3: In order to guarantee provision of more than the minimum level of service, the county shall take the following steps:

- begin planning and preliminary design for expansion when a plant's Average Daily Demand is projected to equal or exceed its capacity within 5 years;
- prepare plans and specifications for expansion when a plant's Average Daily Demand is projected to equal or exceed its capacity within 4 years;
- submit a complete construction permit application to the Florida Department of Environmental Protection for expansion when a plant's Average Daily Demand is projected to equal or exceed its capacity within 3 years; and
- submit an application for an operation permit for the expanded facility to DEP when a plant's Average Daily Demand is projected to equal or exceed its capacity within 6 months.

POLICY 5.4: The county potable water system shall continue to operate as an enterprise system which is financially self-supporting.

POLICY 5.5: The county shall fund potable water capital improvements and expansions through user fees, impact fees, developer's agreements, assessments and other appropriate fees and funding mechanisms.

POLICY 5.6: The county shall pursue state and federal sources of funding available for the improvement and expansion of utility services.

POLICY 5.7: Consistent with the policies of the *Future Land Use Element* of this plan, centralized water service shall be limited to the following areas:

- Areas within the Urban Service Area;
- Areas where the county has legal commitments to provide facilities and services as of the date of adoption of this plan;

- Areas outside of the Urban Service Area where at least a portion of the site is contiguous to an Urban Service Area boundary as depicted on the Official Future Land Use Map or, where located no more than 500 feet from an existing centralized potable water main distribution line that is part of a looped system, or where an approved place of worship or camp/retreat use existed on January 1, 2016 and is approved for water and/or sewer service by Utility Services in conjunction with a utility construction/connection permit filed with Utility Services on or before June 30, 2016. These areas are subject to the following provisions:
 - The maximum density of such land shall be as shown on the Official Future Land Use Map, and the provision of centralized potable water service shall not be justification for an increase in maximum density; and
 - Any and all costs associated with connecting a property to the potable water system, and providing for adequate fire protection, including costs associated with survey, design, permitting, line extensions, construction, restoration, inspections, and certifications, shall be borne by the owner of the property.
- Development projects located outside of the Urban Service Area that meet the criteria of the policies of the *Future Land Use Element* for:
 - clustering of residential development within agricultural areas;
 - clustering of residential development within privately owned upland conservation areas;
 - clustering development within mixed use districts; or
 - traditional neighborhood design communities.
 - public facilities such as public schools.
 - agricultural businesses and industries (including biofuel plants)
- Areas where, consistent with Potable Water Sub-Element Policy 2.4, the risk of private well contamination is determined to be unacceptably high.

OBJECTIVE 6 Privately Owned Public Water Plants

Through the time horizon of the plan, there shall be no instances of Privately Owned Public Water Plant failures or breakdowns.

POLICY 6.1: The county shall limit the use of Privately Owned Public Water Plants to areas that meet the following criteria governing connection to the county potable water system:

- Development served by existing Privately Owned Public Water Plants may continue to receive potable water in that manner until centralized service becomes available. At that time, all development within ¼ mile of a county water line shall connect to the county system. Developments whose potable water system causes a public health problem must connect to the regional system regardless of the distance to water lines.
- Privately owned public water treatment plants shall be allowed in areas of development outside of the Urban Service Area when such development meets the criteria of policies of the Future Land Use Element for:
 - clustered residential development within agricultural planned development projects;
 - clustered development within new town projects;
 - traditional neighborhood design communities; and
 - agricultural businesses and industries (including biofuel facilities)

POLICY 6.2: The county shall ensure that, prior to the issuance of development orders or permits for privately owned public water treatment plants, the applicant has demonstrated that the project complies with the Federal Safe Drinking Water Act, Public Law 93-523; the Florida Safe Drinking Water Act, Section 403.850 - 403.864, FS; Chapter 381, FS; and Rules 62-550, 40C-2, 40C-3, 17-22, and 64E-8, FAC.

POLICY 6.3: The county shall require that issuance of permits for replacement or expansion of existing privately owned public water treatment plants be conditioned upon compliance with the most updated version of DEP regulatory requirements and Federal and State water quality standards as identified in the “Regulatory Framework” section of this sub-element.

POLICY 6.4: To ensure proper maintenance and operation, the Utilities Department shall inspect all privately owned public water treatment plants on an annual basis.

POLICY 6.5: The county shall require all new privately owned public water treatment plants to be built according to the current federal, state, and county requirements. In addition to a county permit demonstrating compliance with county regulations, any developer building and operating a privately owned public water treatment plant must obtain a state permit demonstrating compliance with state and federal regulations. Those regulations include but are not limited to the Federal Safe Drinking Water Act, Public Law 93-523; the Florida Safe Drinking Water Act, Section 403.850 - 403.864, FS; Chapter 381, FS; and Rules 62-550, 40C-2, 40C-3, 17-22, and 64E-8, FAC. Both state and county permits are required for the construction of a plant, and for any future expansion or modification of a plant.

POLICY 6.6: At the time the county approves privately owned public water treatment plants, the county will require that, at the time deemed appropriate by the county, the water treatment plant and associated water distribution system shall be dedicated to the county for operation and maintenance without compensation.

POLICY 6.7: The county shall require all future connections to the regional potable water system to be consistent with the attached water and wastewater connection matrix.

OBJECTIVE 7 Private Wells

By 2020, the number of new private wells permitted annually will not exceed 300.

POLICY 7.1: The county shall limit the use of new private wells to the following:

- Single-family residences located more than 200 feet from any county water line;
- Residential projects that consist of less than 25 units and are located more than ¼ mile from any county water line; and
- Non-residential projects that consume less than 2,000 gallons per day and are located more than ¼ mile from any county water line.

The county shall require all developments whose potable water system causes a public health problem to connect to the regional system regardless of the distance to water lines. All new developments utilizing private well systems shall be required to construct a dry line.

POLICY 7.2: The county shall ensure that, prior to the issuance of development orders or permits for projects served by private wells, the applicant has received a Florida Department of Health permit demonstrating that the project complies with the provisions of Rule 64E-8, FAC.

POLICY 7.3: The county shall require that issuance of permits for replacement of existing private wells be conditioned upon compliance with the most updated version of DEP regulatory requirements and Federal and State water quality standards as identified in the “Regulatory Framework” section of the sub-element.

POLICY 7.4: The county, in coordination with Environmental Health Department, shall establish public education programs on the proper use, inspection requirements, maintenance, and abandonment of private wells.

OBJECTIVE 8 Alternative Water Supply

By 2026, the county will utilize alternative water supply sources for at least 18 mgd of demand. The alternative water source will supplement water obtained from the Upper Floridan aquifer (UFA).

POLICY 8.1: By 2015, the county shall study and identify a viable alternative water source.

POLICY 8.2: By 2020, the county shall obtain all necessary permits to construct the associated infrastructure related to the alternative water support facilities.

POLICY 8.3: By 2023, the county shall complete all construction plans and specifications associated with the alternative water supply facilities.

POLICY 8.4: By 2025, the county shall complete the construction of all infrastructure associated with the alternative water supply facilities.

OBJECTIVE 9 Brine Disposal

By 2015, all reverse osmosis water treatment plant direct brine discharges into the Indian River lagoon will be eliminated.

POLICY 9.1: By 2010, the county shall identify a viable alternative brine discharge method for the South County RO Plant.

POLICY 9.2: By 2012, the county shall obtain all necessary permits to construct the associated infrastructure related to the brine disposal facilities.

POLICY 9.3: By 2013, the county shall complete all construction plans and specifications associated with the brine disposal facilities.

POLICY 9.4: By 2015, the county shall complete the construction of all infrastructure associated with the brine disposal facility for the south county RO plant, and the facility shall be operational.

PLAN IMPLEMENTATION

An important part of any plan is its implementation. Implementation involves execution of the plan's policies. It involves taking actions and achieving results.

For the Potable Water Sub-Element, implementation involves various activities. While some of these actions will be ongoing, others are activities that will be taken by certain points in time. For each policy in this element, Table 3.B.11 identifies the type of action required, the responsible entity for taking the action, the timing, and whether or not the policy necessitates a capital expenditure.

To implement the Potable Water Sub-Element, several different types of actions must be taken. These include: expansion of plant capacity, extension of the distribution network, implementation of interlocal agreements, coordination, and preparation of studies and evaluation and monitoring reports.

Overall plan implementation responsibility will rest with the planning department. Besides its responsibilities as identified in Table 3.B.11, the planning department has the additional responsibility of ensuring that other entities discharge their responsibilities. This will entail notifying other applicable departments of capital expenditures to be included in their budgets, notifying other departments and groups of actions that must be taken, and assisting other departments and agencies in their plan implementation responsibilities.

TABLE 3.B.11
POTABLE WATER SUB-ELEMENT
IMPLEMENTATION MATRIX

POLICY #	TYPE OF ACTION	RESPONSIBILITY	TIMING	CAP. EXPEND.
1.1	Land Dev. Regulations	Planning	Ongoing	NO
1.2	Monitoring Procedures	Utilities	Ongoing	NO
1.3	Land Dev. Regulations	Planning	Ongoing	NO
1.4	Monitoring Procedures	Utilities/Planning	Ongoing	NO
1.5	Summary Reports	Planning	As Needed	NO
1.6	Land Dev. Regulations	Utilities/IRCHD	Ongoing	NO
1.7	Land Dev. Regulations	Planning	Ongoing	YES
2.1	Service Provision	Utilities	Ongoing	YES

2.2	Service Provision	Utilities	Ongoing	NO
2.3	Evaluation Process/ Service Provision	Utilities/IRCHD	Ongoing	YES
2.4	Evaluation Process/ Service Provision	Utilities/IRCHD	Ongoing	YES
2.5	Capital Improvements	Utilities	Ongoing	YES
<u>2.6</u>	<u>Feasibility</u>	<u>Utilities/Planning</u>	<u>2012</u>	<u>NO</u>
3.1	System Maintenance	Utilities	Ongoing	NO
3.2	Monitoring & Evaluation	Utilities/IRCHD	Ongoing	NO
4.1	Land Dev. Regulations	Planning	Ongoing	NO
4.2	Land Dev. Regulations	Planning	Ongoing	NO
4.3	Building Design	BCC	Ongoing	NO
4.4	Coordination	BCC/SJRWMD	Ongoing	NO
4.5	Building Regulations	Building	Ongoing	NO
4.6	Pricing System	Utilities	Ongoing	NO
4.7	Leak Detection	Utilities	Ongoing	NO
4.8	Land Dev. Regulation	Utilities	Ongoing	NO
4.9	Pricing Schedule	Utilities	Ongoing	NO
4.10	Land Dev. Regulation	Utilities/Planning	Ongoing	NO
5.1	CIP Maintenance	Finance/Utilities	Ongoing	NO
5.2	CIP Evaluation & Prioritization	Finance/Utilities	Ongoing	NO
5.3	Capacity Monitoring & Plant Expansion	Utilities	Ongoing	YES
5.4	Land Dev. Regulations	Finance/Utilities	Ongoing	NO
5.5	Land Dev. Regulations	Utilities	Ongoing	YES
5.6	Funding Mechanism	Utilities/Finance	Ongoing	NO

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5.7	Land Dev. Regulations	Utilities/Planning	Ongoing	NO
6.1	Land Dev. Regulations	Utilities/Planning	Ongoing	NO
6.2	Land Dev. Regulations	Utilities/Planning	Ongoing	NO
6.3	Land Dev. Regulations	Utilities/Planning/ IRCHD	Ongoing	NO
6.4	Plant Inspections	Utilities	Ongoing	NO
6.5	Land Dev. Regulations	Utilities/Planning	Ongoing	NO
6.6	Land Dev. Regulations	Utilities/Planning	Ongoing	NO
6.7	Land Dev. Regulations	Utilities/Planning	Ongoing	NO
7.1	Land Dev. Regulations	Utilities/Planning	Ongoing	NO
7.2	Land Dev. Regulations	Utilities/Planning/ IRCHD	Ongoing	NO
7.3	Land Dev. Regulations	Utilities/Planning/ IRCHD	Ongoing	NO
7.4	Public Education Program	Utilities/ IRCHD	Ongoing	NO
8.1	Feasibility Study	Utilities	2015	NO
8.2	Permits	Utilities	2020	NO
8.3	Plans	Utilities	2023	NO
8.4	Construction	Utilities	2025	NO
9.1	Study	Utilities	2010	NO
9.2	Permits	Utilities	2012	NO
9.3	Plans	Utilities	2013	NO
9.4	Construction	Utilities	2015	NO

EVALUATION & MONITORING PROCEDURES

To be effective, a plan must not only provide a means for implementation; it must also provide a mechanism for assessing the plan's effectiveness. Generally a plan's effectiveness can be judged by the degree to which the plan's objectives have been met. Single objectives are structured, as much as possible, to be measurable and to have specific timeframes, the plan's objectives are the benchmarks used as a basis to evaluate the plan.

Table 3.B.12 identifies each of the objectives of the Potable Water Sub-Element. It also identifies the measures to be used to evaluate progress in achieving these objectives. Most of these measures are quantitative, such as percentage of existing units connected to the regional system, per capita water use, completion of the identified improvements of system, and others. Besides the measures, Table 3.B.12 also identifies timeframes associated with meeting the objectives.

The Utilities Department staff will be responsible for monitoring and evaluating the Potable Water Sub-Element. This will involve collection of data and compilation of information regarding facility capacity, expansion, and new development permitted. This will be done on a regular basis. As part of the county's concurrency management system, the Utilities Department will continually monitor the facility capacity to ensure that potable water level-of-service standards will be maintained.

While monitoring will occur on a continual basis, formal evaluation of the Potable Water Sub-Element will occur every five years in conjunction with the formal evaluation and appraisal of the entire comprehensive plan. Besides assessing progress, the evaluation and appraisal process will also be used to determine whether the Potable Water Sub-Element objectives should be modified or expanded. In this way the monitoring and evaluation of the Potable Water Sub-Element will not only provide a means of determining the degree of success of the plan's implementation; it will also provide a mechanism for evaluating needed changes to the plan element.

TABLE 3.B.12
POTABLE WATER SUB-ELEMENT
EVALUATION MATRIX

OBJECTIVE #	MEASURE	TIMEFRAME
1	Availability of sufficient capacity	Through the time horizon of the plan
2	% of residential units connected to regional system	By 2030
3	Compliance with federal and state standards	Through the time horizon of the plan
4	Per capita water use	By 2020
5	Completed improvements	Through the time horizon of the plan
6	# of privately owned public water plant failures or breakdowns	Through the time horizon of the plan
7	# of new private wells permitted annually	By 2020
8	Alternative Water Supply	By 2018
9	Brine Disposal	By 2015

**Table 3.B.13
Water and Wastewater Connection Matrix for New Development**

	Inside of the Urban Service Area	
	Connect	Not Connect
Single Family:		
Within 200' of system	X	
Outside of 200' of system		X
Residential Projects: Subdivision, multi-family, site plan, PD, DRI Within ¼ mile of the system		
25 units or more	X	
Less than 25 units	X	
Outside of ¼ mile of system		
25 units or more	X	
Less than 25 units		X**
Non-Residential Projects: Subdivision, site plan, PD, DRI Within ¼ mile of system		
2,000 gallons daily flow or more*	X	
Less than 2,000 gallons daily flow*	X	
Outside of ¼ mile of system		
2,000 gallons daily flow or more*	X	
Less than 2,000 gallons daily flow*		X**

* Daily flow refers to water consumption or sewer generation.

**The applicant for any development project, where such project will not connect to a centralized system, must sign a developer's agreement with the Indian River County Utilities Department to operate on a private system with a commitment to connect to the regional system when service is available. These agreements shall be conditioned upon demonstration of compliance with applicable federal, state, and local permit requirements. When using a private system or on-site facilities, the developer must construct a dry line or wet line at the time of construction, if required by the Utilities Department. The final determination for the type of non-residential establishment which can utilize a private system shall be made by the Utilities Department, Community Development Department, and Environmental Health Department.

System Availability: A system is considered available when a collection or distribution line exists in a public easement or right-of-way.

Distance Determination: Distance determinations are made from the nearest point of the project (area of development) to the public facility directly through public easements or public rights-of-way.

Indian River County Five Year Schedule of Improvements

APPENDIX A: Sanitary Sewer and Potable Water						
Revenue	FY 2009/10	FY 2010/11	FY 2011/12	FY 2012/13	FY 2013/14	Total
Capacity Charges & User Fees	\$ 17,299,793	\$ 1,200,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 22,999,793
Total Revenue	\$ 17,299,793	\$ 1,200,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 22,999,793

Expenditures	FY 2009/10	FY 2010/11	FY 2011/12	FY 2012/13	FY 2013/14	Total	Revenue Source
Misc Water Improvements	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 1,250,000	Capacity Charges & User Fees
Misc Sewer Improvements	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 875,000	Capacity Charges & User Fees
West Reg WWTF Expansion 2.0 to 6.0 MGD	\$ 1,024,382	\$ -	\$ -	\$ -	\$ -	\$ 1,024,382	Capacity Charges & User Fees
77th West of Kings (Tuscanny Lakes)	\$ 112,237	\$ 112,237	\$ 112,237	\$ -	\$ -	\$ 336,711	Capacity Charges & User Fees
12WM 17th St. SW from 27th Av to 43rd Av	\$ -	\$ -	\$ -	\$ 610,000	\$ -	\$ 610,000	Capacity Charges & User Fees
(Convert 8"FM) 16" Reuse Lateral G Conversion	\$ 840,343	\$ -	\$ -	\$ -	\$ -	\$ 840,343	Capacity Charges & User Fees
FM and WM on 4th st from 82nd to 98th ave and on 98th from 4th to 8th	\$ -	\$ -	\$ -	\$ -	\$ 1,000,000	\$ 1,000,000	Capacity Charges & User Fees
Convert North County Brine Line to Reuse Main	\$ 1,295,000	\$ -	\$ -	\$ -	\$ -	\$ 1,295,000	Capacity Charges & User Fees
12" WM on 27th Ave from 13th st SW to 17th St SW (Madera Isles & Echo Lake	\$ -	\$ -	\$ -	\$ 341,000	\$ -	\$ 341,000	Capacity Charges & User Fees
Tie South County Brine Line to Existing FM	\$ 270,000	\$ -	\$ -	\$ -	\$ -	\$ 270,000	Capacity Charges & User Fees
58th Av 65th St to 69th St & along 61st and 69th St	\$ 50,000	\$ 500,000	\$ 450,000	\$ 232,000	\$ -	\$ 1,232,000	Capacity Charges & User Fees
N of Windsor & Polo Club Extension	\$ -	\$ -	\$ 225,000	\$ 20,000	\$ -	\$ 245,000	Capacity Charges & User Fees

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Potable Water Sub-Element

Svce Transmission Lines Oslo Pk, Villages of VB Gardens	\$ -	\$ -	\$ -	\$ 700,000	\$ -	\$ 700,000	Capacity Charges & User Fees
Install 12" WM along 66th Ave from 16th St to SR 60 & 16" WM along 16th St.	\$ 609,356	\$ -	\$ -	\$ -	\$ -	\$ 609,356	Capacity Charges & User Fees
Install Wells and Piping at North County RO Plant	\$ 1,965,580	\$ -	\$ -	\$ -	\$ -	\$ 1,965,580	Capacity Charges & User Fees
Install Well No.7 st S. Co. RO Plant	\$ 1,200,000	\$ -	\$ -	\$ -	\$ -	\$ 1,200,000	Capacity Charges & User Fees
Falcon Trace Developer's Agreement	\$ 44,502	\$ 44,502	\$ 44,502	\$ -	\$ -	\$ 133,506	Capacity Charges & User Fees
Install 6" FM in Conjunction with 43rd Ave Road Widening	\$ 335,000	\$ -	\$ -	\$ -	\$ -	\$ 335,000	Capacity Charges & User Fees
Install 6" FM along 16th St west of 43rd Ave	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ 100,000	Capacity Charges & User Fees
16" WM from Kings highway Tank to College Lane	\$ 290,450	\$ -	\$ -	\$ -	\$ -	\$ 290,450	Capacity Charges & User Fees
Install 24" WM along 77th St from 66th Ave to 70th Ave then North to CR 510	\$ -	\$ -	\$ 500,000	\$ 880,000	\$ -	\$ 1,380,000	Capacity Charges & User Fees
N. Reg. Reuse Sto. & Repump Facility with Transmission Mains to Barrier Island	\$ 1,501,327	\$ 1,125,038	\$ -	\$ -	\$ -	\$ 2,626,365	Capacity Charges & User Fees
Construct 8" WM on Oslo from 8th Ct. to 9th Ct.	\$ 30,000	\$ -	\$ -	\$ -	\$ -	\$ 30,000	Capacity Charges & User Fees
Construct 12" WM along 53rd St. E/O RR, Lat H Canal	\$ 795,000	\$ -	\$ -	\$ -	\$ -	\$ 795,000	Capacity Charges & User Fees
Construct 20"WM on 66th Av 41st to 77th St	\$ -	\$ -	\$ -	\$ -	\$ 500,000	\$ 500,000	Capacity Charges & User Fees
Construct 20" WM on 66th Av from 20th St. to 41st St.	\$ -	\$ 1,000,000	\$ 1,500,000	\$ -	\$ -	\$ 2,500,000	Capacity Charges & User Fees
Verona Trace Developer's Agreement	\$ 40,100	\$ 40,100	\$ 40,100	\$ -	\$ -	\$ 120,300	Capacity Charges & User Fees
Madera Isle/Echo Lake Dev Agreement	\$ -	\$ -	\$ 97,400	\$ 97,400	\$ -	\$ 194,800	Capacity Charges & User Fees
Upgrade Dataflow System w/Auto Valves	\$ 200,000	\$ -	\$ -	\$ -	\$ -	\$ 200,000	Capacity Charges & User Fees
Total Expenditures	\$ 11,128,277	\$ 3,246,877	\$ 3,394,239	\$ 3,305,400	\$ 1,925,000	\$22,999,793	

Comprehensive Plan**Potable Water Sub-Element**

Comparison of Expenditures to Revenue	FY 2009/10	FY 2010/11	FY 2011/12	FY 2012/13	FY 2013/14	Total
Total Revenue	\$ 17,299,793	\$ 1,200,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$22,999,793
Total Expenditures	\$ 11,128,277	\$ 3,246,877	\$ 3,394,239	\$ 3,305,400	\$ 1,925,000	\$22,999,793
Annual Balance	\$6,171,516	-\$2,046,877	-\$1,894,239	-\$1,805,400	-\$425,000	\$0

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