



*The
Utilities Chapter*

Sarasota City Plan

and

Support Document

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The Utilities Plan

INTENT AND PURPOSE

The City of Sarasota operates and maintains four utility systems - potable water, wastewater, reclaimed water, and solid waste. Sarasota County provides landfill capacity for solid waste disposal and operates and maintains the stormwater drainage system. These services are essential to the health, safety and welfare of the population of the City. The intent and purpose of the Utilities Chapter is to present a long-term strategic plan to meet the existing and future utility needs of the City's residents and businesses. The foundation for this Chapter is **Sarasota's Strategic Plan** and Florida statutory requirements.

Sarasota's Strategic Plan Goals

In 2016, the City Commission adopted "The City Sarasota Strategic Plan", which provides the foundation for the City's Vision which is to be a world-class community and treasured destination, with enduring natural beauty, charm, and diversity. The City's motto is "Where Urban Amenities Meet Small-Town Living." Our mission is to provide high-quality services to our residents, businesses, and visitors, while safeguarding our natural resources and building a prosperous community.

Goals and key actions that have particular relevance to this chapter are:

Goal 1 – Recognize the vital role Sarasota's natural resources play in a healthy community and economy, and implement projects and policies that sustain them.

Key Actions

1.6 – Improve community recycling utilization rates and decrease solid waste generation.

1.7 – Prioritize public education efforts to address urgent local environmental issues such as commercial recycling needs, and pollution from improper disposal of restaurant waste.

Goal 4 – Manage growth and development so residents, visitors and businesses are assured that the City's special character will be sustained; that the natural beauty, neighborhood quality, historic charms, urban vibrancy, and other features of Sarasota's high quality of life will be preserved throughout its future.

Key Action

4.5 – Ensure adequate funding is planned to meet current and future service demands (including, but not limited to, providing adequate water, sewer and solid waste services a sustainable transportation network and public parking inventory; protected natural spaces; and sufficient affordable housing options).

Florida Statutory Requirements

The Utilities Chapter is also intended to meet the requirements as outlined in Section 163.3177(6)(c), Florida Statutes.

Organization of the Utilities Plan

The Utilities Plan consists of a goal followed by objectives and action strategies pursuant to the goal.

The Utilities Plan is organized around objectives addressing the following topics:

- Objective 1. Utility System to Meet Present and Future Needs,
- Objective 2. Environmentally Sensitive Utility Services, and
- Objective 3. Coordination with the Future Land Use Map.

The Utilities Plan is one of the eleven plans which collectively represent the Sarasota City Plan. This Plan can neither stand-alone nor be interpreted independent of the others.

Implementation of the Sarasota City Plan

Implementation of the Sarasota City Plan will require actions by both the public and private sectors. In this regard many of the plan components speak to “the City” pursuing certain actions to:

promote, provide, consider, identify, enhance, create, maintain, conserve, support, reduce discourage, coordinate, and employ.

While these actions may be initiated by City government itself, City government will also be expecting applicants seeking development approvals to pursue these same standards and best management practices as part of their applications.

GOAL, OBJECTIVES, AND ACTION STRATEGIES

Goal

It shall be the goal of the City of Sarasota to meet the existing and future utility needs of the city's residents and businesses through the provision of safe and efficient utility facilities; to construct, maintain, and operate utility facilities in an environmentally sensitive manner; and to coordinate provision of facilities with the future land use plan map.

Objective 1 - Utility System to Meet Present and Future Needs

The City shall continue to provide a safe and efficient utility system that meets present and future needs.

Action Strategies

- 1.1 **Potable Water:** New development shall be required to connect to the City's centralized water system pursuant to Chapter 37, Sarasota City Code, as may be amended.
- 1.2 **Potable Water Level-of-Service:** The potable water system shall provide 200 gallons per day of treatment capacity per equivalent residential unit (ERU) to ensure adequate and safe water supplies. Concurrency for potable water supply shall be determined consistent with the Concurrency Management System (Attachment 5) adopted in the Future Land Use Plan.
- 1.3 **Wastewater:** New development shall be required to connect to the City's centralized wastewater system pursuant to Chapter 37, Sarasota City Code, as may be amended.
- 1.4 **Wastewater Level-of-Service:** The wastewater system shall provide for 200 gallons per day of treatment capacity per equivalent residential unit (ERU) to ensure adequate and safe wastewater services.
- 1.5 **Elimination of Septic Systems:** The City will pursue the objective of eliminating the remaining septic systems in the City, taking into consideration the relationship of benefits to costs on a case by case basis.

- 1.6 **Solid Waste Collection and Disposal Level-of-Service:** The solid waste collection system shall provide collection and disposal of 6.9 pounds of waste per day per capita to ensure adequate and safe solid waste services. The City shall ensure safe and accessible locations of recycling and solid waste receptacles.

The City of Sarasota shall continue to coordinate with Sarasota County to ensure adequate allocation of landfill space by the County for the City's projected needs, including investigation of alternative methods of disposal such as resource recovery and recycling.

- 1.7 **Stormwater Drainage:** The City shall require development to provide facilities for stormwater drainage in accordance with the Engineering Design Criteria Manual and in accordance with the requirements of Florida Administrative Code, Chapter 62-25.
- 1.8 **Stormwater Drainage Level-of-Service:** The stormwater drainage system shall provide adequate capacity to maintain a minimum level-of-service C (Street and Yard Flooding only) using a 25-year/24-hour design storm.
- 1.9 **Sarasota County Stormwater Fee Proceeds:** Proceeds from Sarasota County Stormwater special assessments shall be used for maintenance, planning, elimination of structure flooding, and the reduction of pollutants carried by stormwater runoff into Sarasota Bay.
- 1.10 **Drainage System Improvements:** The City shall work with the Sarasota County Stormwater Environmental Utility to:
- complete Basin Master Plans,
 - evaluate the recommended improvements to the drainage system to correct existing deficiencies as identified in each Basin Master Plan, and
 - as the funds are available will consider implementing the improvements.
- 1.11 **Development:** Development shall be subject to the availability of adequate levels of service for potable water, wastewater, solid waste, and drainage improvements, pursuant to the relevant action strategies of the Capital Improvements Chapter. The design and function of utility infrastructure shall be in compliance with the requirements of the City's Engineering Design Criteria Manual (EDCM).
- 1.12 **Utility Capacity:** The Development Review Committee shall meet at least once per month to review requests for development approvals and assess the impacts of the proposed developments on levels of service for potable water, wastewater, solid waste, and drainage.

Development approval means approval of rezonings, conditional uses, site plans, and subdivision plats.

- 1.13 **Annexation:** The City may extend potable water and/or wastewater service to private users outside the City limits when a property is subject to an approved pre-annexation agreement. Potable water and/or wastewater service extensions to governmental entities will require the negotiation of an agreement between the City and the user and will only occur if annexation is explored by the City and is determined to be feasible and the agreement is in the City's interest.
- 1.14 **Capital Improvements:** The projects identified in Illustration CI-7 of the Capital Improvements Chapter, will be implemented to achieve and maintain the level-of-service standards.
- 1.15 **Inflow and Infiltration into the Wastewater System:** During the annual budget process, capital improvements which address inflow and infiltration control shall be given priority consideration for funding. Projects may include replacement or rehabilitation of the wastewater collection system in the City owned right-of-way or outreach and coordination with owners of private sewer mains. The most cost effective method will be determined from inspection of the wastewater gravity mains and use of empirical data.
- 1.16 **Southern Water Use Caution Area:** The City shall participate with the Southwest Florida Water Management District and any other relevant agencies, in the implementation of rules for the Southern Water Use Caution Area.
- 1.17 **Provision of High-Tech Infrastructure:** The City will encourage private utilities to provide the high-tech needs of its existing and potential businesses during the creation or renewal of franchise agreements for the use of the public right-of-way.
- 1.18 **Coordination with the Water Planning Alliance:** The City will coordinate its water supply planning efforts with the Water Planning Alliance, which has been formed in the four county area of the Peace River/Manasota Regional Water Supply Authority. A City Commissioner is assigned as a member of the Planning Alliance Board, with a backup City Commissioner assigned to act in their place in the event of their absence.
- 1.19 **Coordination with SWFWMD:** The City will coordinate its water supply planning efforts with the Southwest Florida Water Management District's Regional Water Supply Plan.
- 1.20 **Water Supply Facilities Work Plan:** The City shall maintain and implement a Water Supply Work Plan to ensure that potable water facilities are sufficient to serve the City's population. The Five-year Schedule of Capital Improvements (Illustration CI-7) shall be updated annually to include water supply projects. The Water Supply Facilities Work Plan shall be updated within 18 months after the Southwest Florida Water Management District updates its Regional Water Supply Plan.

Objective 2 - Environmentally Sensitive Utility Services

The City shall continue to provide utility services in an environmentally sensitive manner.

Action Strategies

- 2.1 **Reclaimed Water Usage:** The City shall promote maximum usage of its reclaimed water. Information regarding reclaimed water usage shall be made available at the City's internet site, www.sarasotafl.gov.
- 2.2 **Environmental Protection from Stormwater Runoff:** The quality and quantity of stormwater runoff shall be regulated in accordance with:
 - Chapter 17-25 Florida Administrative Code;
 - Environmental Resource Permitting of Surface Water Management Systems, administered by the Southwest Florida Water Management District, (Chapters 40D-4, 40D-40, 40D-45 and 40D-400, Florida Administrative Code);
 - National Pollutant Discharge Elimination Permit No. FLS000004; and
 - The City's Engineering Design Criteria Manual (EDCM), Chapter 29.5, Ordinance 89-3278, in order to protect the quality of receiving water bodies. The EDCM will continue to require that any new development not be allowed to shed stormwater at a higher rate onto adjacent right-of-way or property than was discharged from the site in its prior existing state.
- 2.3 **Governmental Coordination:** The City shall coordinate with appropriate governmental agencies in controlling the impact of stormwater runoff on the quality of Sarasota Bay. The City will continue to coordinate with Sarasota County, the Town of Longboat Key, the City of North Port, the City of Venice, and the Florida Department of Transportation in compliance with the U.S. Pollutant Elimination System, Municipal Separate Storm Sewer System, Permit No. FL S 000004 MS4.
- 2.4 **National Pollutant Discharge Elimination System Permit:** The City shall comply with U.S. Environmental Protection Agency, National Pollutant Discharge Elimination System Permit No. FLS000004. The provisions of this permit include, but are not limited to, the following:
 - litter control and disposal;
 - street sweeping;
 - construction, operations and maintenance of stormwater facilities;
 - operations and maintenance of solid waste transfer facilities;
 - employee training and licensing programs related to herbicides, pesticides and fertilizers;

- inspections for illegal dumping;
- programs related to oil recycling and the proper disposal of hazardous waste; and
- public education.

2.5 **Florida Department of Environmental Protection Permit:** The City shall comply with Florida Department of Environmental Protection Permit #FL0040771-01 to operate the advanced wastewater treatment and disposal system using reclaimed water for urban and agricultural irrigation and backup surface water discharge to Whitaker Bayou during wet weather months when necessary.

2.6 **Permeable Surfaces:** The Engineering Department shall explore the use of permeable surfaces as an alternative to impervious pavement surfaces to minimize runoff.

2.7 **Water Conservation:** The City shall comply with Environmental Resource Permitting of Surface Water Management Systems, administered by the Southwest Florida Water Management District (SWFWMD), (Chapters 40D-4, 40D-40, 40D-45 and 40D-400, Florida Administrative Code) and cooperate with the SWFWMD on water conservation programs. The Utilities Department shall participate with SWFWMD by including water conservation educational material in utility bills at least once per year. The City will also continue to employ water conservation practices such as:

- Using urban and agricultural use of reclaimed domestic wastewater as the City's primary method of wastewater disposal;
- Exploring and implementing methods for expanding the use of reclaimed water;
- Metering of all potable water and reclaimed water use, including separate metering of potable water irrigation use;
- Meter maintenance which includes the repair and replacement of water meters;
- Enforcing requirements of Florida Statutes 553.14 limiting the gallons permissible for flushing water closets and flow rate of showers;
- Enforcement of City Ordinance 90-3418, limiting the gallons permissible for flushing water closets and flow rate of showers;
- Periodic system water audits;
- The Renewal, Replacement and Improvement program designed to update the distribution system infrastructure, thereby reducing leaks and unaccounted for water use; and
- Conservation Education Activities, including water treatment plant tours, speakers to address groups in the community, and periodic insertion of a brief message on water conservation in the body of water bills.

2.8 **Potable Water Protection:** The City of Sarasota shall continue to coordinate with Sarasota and Manatee Counties to ensure protection of the City's potable water sources and groundwater recharge areas pursuant to the Sarasota County Wellhead Protection Ordinance #92-079, or Manatee County Zoning Ordinance Section 738

(Groundwater/Wellhead Protection), and the Florida Department of Environmental Protection Rule 62-521 that became effective in July 1995.

- 2.9 **Solid Waste Reduction:** The City shall cooperate with Sarasota County to reduce the volume of solid waste generated within the City limits and requiring landfill disposal. Recycling shall be mandatory within the City in accordance with Ordinance No. 94-3786, as may be amended. A City representative shall attend meetings of Sarasota County Government's Solid Waste Advisory Board.
- 2.10 **Hazardous Waste Disposal:** The City shall cooperate with Sarasota County in the Biannual Amnesty Days, an advertised outreach program encouraging people to take their hazardous waste to collection points for proper disposal. Hazardous wastes may be disposed of at the Sarasota County hazardous waste disposal site or, in the case of small quantities, at the City contractor's waste transfer station.
- 2.11 **Illegal Dumping:** The City shall continue to prohibit the illegal dumping of junk, inoperable or unlicensed motor vehicles, rubbish or trash.
- 2.12 **Underground Utilities:** In order to provide a higher level of protection for utility lines and facilities, the City shall require the placement of utilities underground when feasible.
- 2.13 **Aesthetic Treatment of Retention Ponds:** The City shall continue to make provisions in the Land Development Regulations for the aesthetic treatment of retention ponds.

Objective 3 - Coordination with the Future Land Use Map

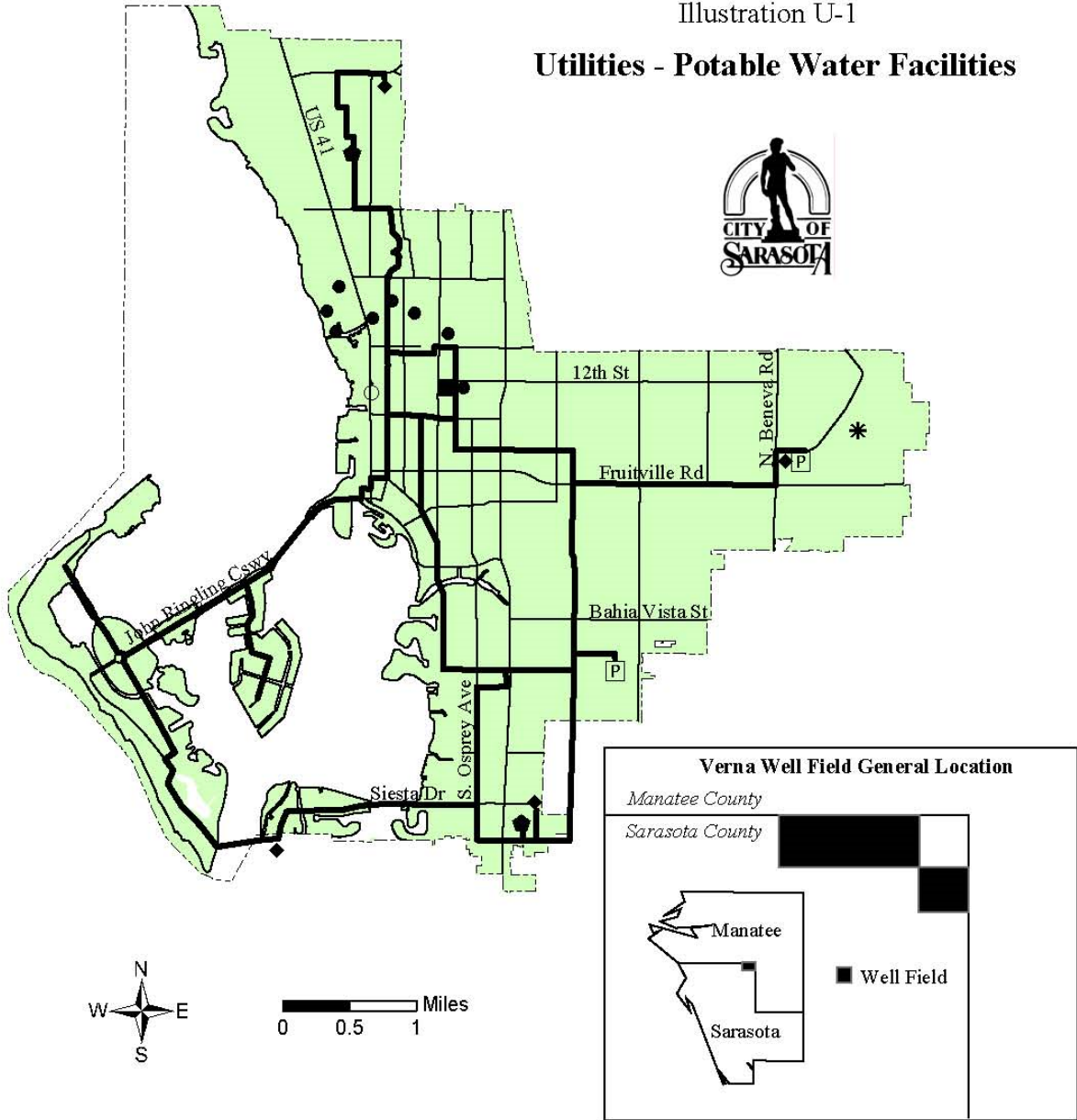
The City shall continue to coordinate the provision of utility facilities with the future land use map.

Action Strategies

- 3.1 **Utility Availability:** Land Use studies and amendments to the *Sarasota City Plan* shall consider the availability of utility facilities as a determinant of appropriate land use and shall encourage redevelopment and infill development to maximize existing facilities and discourage urban sprawl.
- 3.2 **Annexation:** To ensure adequate service delivery and discourage urban sprawl, properties proposed for annexation shall be within the Urban Service Boundary of the Future Land Use Plan.
- 3.3 **Stormwater Management:** The City will explore alternatives to balance redevelopment efforts and site specific stormwater management requirements.

- 3.4 **Regional Stormwater Management:** In recognition of the desires to improve watershed management while promoting continued urban development and redevelopment, the City shall assist Sarasota County in investigating the feasibility of utilizing aggregate and/or regional stormwater management facilities.

Illustration U-1
Utilities - Potable Water Facilities



- | | |
|-------------------------------------|--------------------------------|
| City Limits | Ground Storage Pumping Station |
| Distribution Line Interconnect | Water Treatment Plant |
| Downtown Reverse Osmosis Well Field | Major Distribution Lines |
| Bobby Jones Well Field | Major Streets |
| Discharge Location | City shoreline |
| Elevated Storage | |

Source: City of Sarasota Public Works Department, 2003

The Utilities Support Document

The inventory and analysis in the Support Document provides the foundation for the Plan portion of this Chapter.

The Support Document is not adopted.

INVENTORY AND ANALYSIS

There are four utility systems operated and maintained by the City of Sarasota: potable water, wastewater, reclaimed water, and solid waste. The City's Utilities Department is responsible for the overall performance of the potable water, wastewater, and reclaimed water systems. The City's Public Works Department is responsible for the overall performance of the solid waste system. The City works in cooperation with Sarasota County which provides landfill capacity for solid waste disposal. Sarasota County also operates and maintains the stormwater drainage system.

POTABLE WATER SUPPLY PLAN

The City of Sarasota operates, maintains and provides capital reinvestment to a complete potable water service. There are no private potable water facilities in the City. All facilities are public and are maintained by the City of Sarasota Utilities Department which serves the corporate limits of the City. Eighty-nine properties annexed along the Tamiami Trail south of Bee Ridge Road in December of 1996 receive potable water from Sarasota County Utilities. This will not change as a result of annexation.

For additional information regarding potable water, see the discussion of ground water resources in the Environmental Protection and Coastal Islands Chapter of the *Sarasota City Plan*.

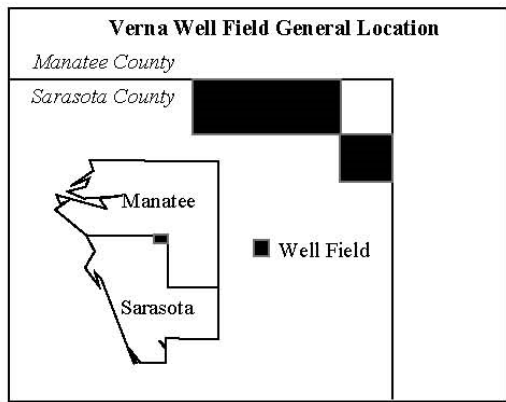
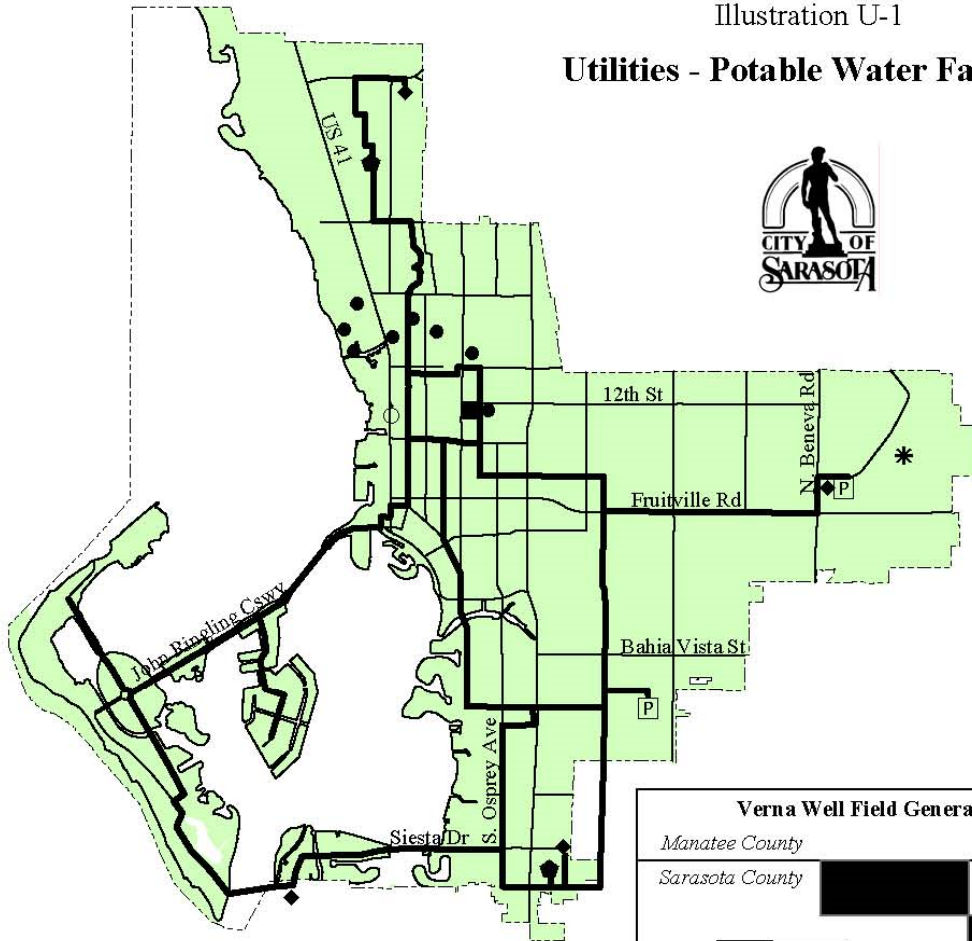
Facility Analysis

Illustration U-1 shows the location of the existing potable water facilities which provide service within the City of Sarasota. The potable water treatment facility consists of raw water supply facilities, water treatment plant, distribution system, storage, and pumping facilities

The existing water treatment plant came on line in 1982. The plant's mechanical infrastructure such as pumps and rotating machinery has a design life span of 20 years, while that of the piping and tanks is 50 years. A complete renovation of the Reverse Osmosis Treatment System was completed in 2003 at a cost of \$4.5 million. The Schedule of Level-of-Service Projects in the Capital Improvements Chapter includes the repair, replacement, and improvement of infrastructure as needed on an ongoing basis to maintain the design capacity of the facilities. The Capital Improvements Chapter provides a list of projects required to achieve or maintain the facilities and level-of-service through the next five-year planning period.

Raw water supplies are regulated through state Water Use Permits issued by the Southwest Florida Water Management District (SWFWMD). The City is currently allowed an annual average daily withdrawal of 12 million gallons per day (MGD). The City's water supply comes from two sources: the Verna wellfield located 17 miles east of the City and the Downtown Reverse Osmosis (R/O)

Illustration U-1
Utilities - Potable Water Facilities



- | | |
|-------------------------------------|--------------------------------|
| City Limits | Ground Storage Pumping Station |
| Distribution Line Interconnect | Water Treatment Plant |
| Downtown Reverse Osmosis Well Field | Major Distribution Lines |
| Bobby Jones Well Field | Major Streets |
| Discharge Location | City shoreline |
| Elevated Storage | |

Source: City of Sarasota Public Works Department, 2003

well field which is located within the City. The Verna wells have a permitted average annual withdrawal capacity of 6 MGD of raw water. The water receives primary treatment consisting of aeration, chlorination, and retention in a one million gallon ground storage reservoir. It is then pumped to the treatment plant at 12th Street. Seventy percent is treated in an ion exchange process while the remaining thirty percent is held to be blended with treated water.

The downtown wellfield has a permitted average annual withdrawal capacity of 6 MGD of raw water for the reverse osmosis facility. The facility has a production capacity of 4.5 MGD of finished water. The 25 percent loss (1.5 MGD) is the result of processing raw water into finished water. The unfinished water is discharged into Hog Creek to support habitat restoration by design. The reverse osmosis water is then blended with the Verna well water to provide a final blend that is chlorinated and pumped to storage.

While the treatment system has a design capacity of 12 MGD, it is effectively limited to producing approximately 10 MGD of potable water by the SWFWMD water use permits allowable withdrawal capacities, which is based upon projected demand through the life of the permit. The City maintains Water Use Permits through the SWFWMD for the Downtown R/O wellfield and the Verna wellfield. Permit renewals will be applied for by the City and are reviewed and approved by SWFWMD. The City's current water use permits are:

- 204318.004, Verna well field, effective from 2013 to 2033;
- 2010224.002, Downtown well field, effective from 2011 to 2030; and
- 2010225.002, Bobby Jones well field, effective from 1998 to 2018.

The City has a water use permit for four groundwater wells that are located at the Bobby Jones Golf Course. The permit authorizes the maximum withdrawal of 1.7 MGD during emergency events. Typically, the City only pumps these wells during routine maintenance of the system.

The water distribution system consists of water mains ranging in size from 6 to 30 inches in diameter. The mainland service is supplied by 12-inch through 30-inch feeder mains with a looped 16-inch transmission main supplying Bird, St. Armands, Lido, and Siesta Keys. The water storage system consists of two elevated storage tanks with a combined capacity of 500,000 gallons. Booster pumping stations combined with ground storage provide an additional 6.5 million gallons of storage.

Level-of-Service

In the 1989 *Sarasota City Plan*, a service level for potable water of 150 gallons per capita per day was adopted. Projected needs were then based on a “functional population” which included residential and seasonal population, but not daily visitors and commuters to the City as does the “functional population” for this update of the *Sarasota City Plan*. Many people in the “functional population” have little or no impact on the water demand. For example, someone who enters the city limits, shops, and then leaves is considered to be part of the “functional population”, yet will use little or no water during the shopping visit. Another example would be someone who lives outside the city limits and works inside the city limits. In aggregate, such individuals have an impact on the water service, but individually do not have the same impact as a full-time or seasonal resident of the city. To illustrate

this point, the average of the “In Season Functional Population” and “Out of Season Functional Population” in 2016 was 63,997 and the average of these respective annual daily potable water flows recorded at the potable production facility for the year ending April 30, 2016 was 6.16 MGD. Dividing 6.16 MGD by 63,997, this works out to a demand of slightly less than 97 gallons per capita per day, and slightly more than 53 gallons per capita per day below the adopted level-of-service.

Utility planners have come to recognize the sometimes arbitrary nature in the derivation of a “functional population” that accurately describes patterns of water use for different segments of the population. The term “equivalent residential unit” (ERU) has been developed to more accurately define an amount of water or wastewater demand that is equivalent to that used by a typical single-family residence. An ERU is defined by the City as a residential billing unit such as a single-family residence, apartment unit, condominium unit, or commercial consumption equal to 6000 gallons of water used per month. The ERU is specific to the utility system being described factoring the differences among users into the calculation. The ERU becomes the common denominator in facility needs planning and utility rate sufficiency analysis. Therefore, the units of level of service have been changed from gallons per capita per day to gallons per ERU per day.

Records of the number of ERU’s served are reflected in the number of unit service charges tallied by the City’s Utility Billing Office. The City of Sarasota considers 200 gallons per day per ERU as adequate treatment capacity based on an analysis provided by the City’s former Engineer of Record, Atkins North America. The average annual water use recorded at the water treatment plant for the year ending April 30, 2016 was 6.16 MGD. The number of ERU’s served was approximately 41,820 which at 200 gallons per day per ERU equates to a LOS required of 8.36 MGD. This is well within the capacity of the City’s system which is 10 MGD based upon the existing SWFWMD water use permit.

Projected Water Demand

In December 2006, Post, Buckley, Schuh & Jernigan, Inc. prepared an “Initial Capacity Analysis Report” that described the Utilities Department’s water production capabilities. Their report indicated that assuming a per adjusted capita demand of 103 gallons, the City would not exceed plant capacity through the year 2015. The actual average daily flow between May 2015 and April 2016 was 6.16 MGD, indicating the water production was sufficient. The following table includes the projected plant capacity demand through 2030 using a more conservative per adjusted capita demand of 110 gallons:

Year	Adjusted Population	Annual Daily Flow	Max Annual Daily Flow
2010	84,129	9.3	10.4
2015	87,308	9.6	10.8
2020	90,353	9.9	11.2
2025	92,964	10.2	11.5
2030	95,179	10.5	11.8

Water Conservation Practices

Following is a discussion of the water conservation practices and programs that the City currently employs or plans to implement.

Conservation Rate Structure

The City employs an inclining tiered rate structure to encourage potable water conservation. The user fees escalate during as a customer consumes greater quantities of water. Therefore, the rate structure is designed to discourage higher usage of potable water.

The monthly residential rate schedule effective on September 1, 2015 is:

Unit Service Charge: \$16.72

Monthly Volume	Rate Per 1,000 Gallons
1 to 4,000	\$3.38
4,001 to 8,000	\$3.98
8,001 to 12,000	\$5.57
12, 001 to 24,000	\$8.34
Over 24, 000	\$12.94

The monthly commercial rate schedule is:

Unit Service Charge: \$23.01

Monthly Volume	Rate Per 1,000 Gallons
1 to 4,000	\$6.70
Over 4,000	\$7.89

Metering

Potable Metering: All potable water use is metered within the City. Metering is among the most effective and most widely used water conservation methods. The City utilizes Automated Meter Reading (AMR) type of water meters.

Irrigation Metering: Upon request, provisions can be made for separate metering of potable water irrigation. The rate structure incorporates a tiered inclining block structure for irrigation use which encourages conservation.

Meter Maintenance: Accurate metering is a proven successful tool used to discourage wasteful and non-essential use of water by the consumer. An ongoing in-house meter repair/replacement program is in place. Coupled with routine change-out of meters annually, this program results in each meter being replaced at least every 12 years or per manufacturers recommendation.

New Building Construction/Remodeling: Concurrent with the enactment of Florida Statute 553.14, limiting the gallons permissible for flushing water closets and limiting the flow rate of showers, the City, through its Neighborhood and Development Services Department, began

actively enforcing the requirements of this statute. City ordinance 90-3418 amended the City Code effective January 1, 1991 to require the following:

- Water closets, either flushtank or flushometer-operated shall be designed, manufactured and installed to operate and adequately flush with no more than 1.6 gallons of water per flushing cycle when tested in accordance with applicable standards.
- Urinals shall be designed, manufactured and installed to operate and adequately flush with no more than 1.5 gallons of water per flush.

Leak Reduction

In order to correct low pressure and leakage caused by outdated cast iron, asbestos cement, and galvanized water mains, the City has a Renewal, Replacement, and Improvement Program designed to upgrade the distribution system infrastructure.

The installation of new PVC water mains replacing old cast iron, asbestos cement, and galvanized mains is ongoing. Service and main line leaks are repaired as necessary. Roadway construction also allows for replacement of older water mains. Installation of PVC water mains occurs in conjunction with the construction of new roads.

Land-Use Policies

The interrelationships among policies of land and water use are recognized by the City. The following are programs that promote conservation and water use efficiency.

Run-Off Reduction

The City's "Engineering Design Criteria Manual" addresses stormwater attenuation requirements for all new subdivisions and other multi-family developments within the City limits. Attenuation is a design principle whereby additional stormwater run-off created by development is controlled so that it does not increase the probability of flooding either upstream or downstream property owners. Adequate retention areas and controls are engineered so that the rate of discharge into the receiving body is not increased. Run-off reduction enhances the ability of precipitation that falls on land surfaces to be absorbed by the soil (infiltration), thus recharging the groundwater supplies.

The City and Sarasota County Government have entered into an interlocal agreement creating a "Stormwater Environment Utility" to comply with the National Pollutant Discharge Elimination System (NPDES) regulations for the management of municipal stormwater. Sarasota County as the lead agency and the City as a co-permittee for this endeavor received one of the first such permits issued. This program provides the mechanism for funding, monitoring, maintenance, and capital improvements of the stormwater management system.

Urban and Agricultural Reclaimed Water Usage

The Urban and Agricultural Reclaimed Project provides highly treated wastewater effluent (known officially as Reclaimed Water and commonly as Reuse Water) for use in irrigating residential and commercial landscapes, golf courses, park lands, and agricultural enterprises. At the reclaimed water sites, storage facilities and irrigation systems manage the reclaimed water contributing to the maintenance of the operations (see Illustrations U-2A and U-2B).

The Project has been developed in three phases. Phase I began in 1988 with the objective of providing reclaimed water to three golf courses totaling 90 holes of golf, three citrus groves with more than 1200 planted acres, and nearly 3500 acres of pasture irrigation. The design capacity for these uses totals more than 7.5 million gallons per day. The last of these facilities became operational in December 1995. This phase has resulted in a number of groundwater withdrawals being placed on stand-by as the reclaimed water became the primary source of supply.

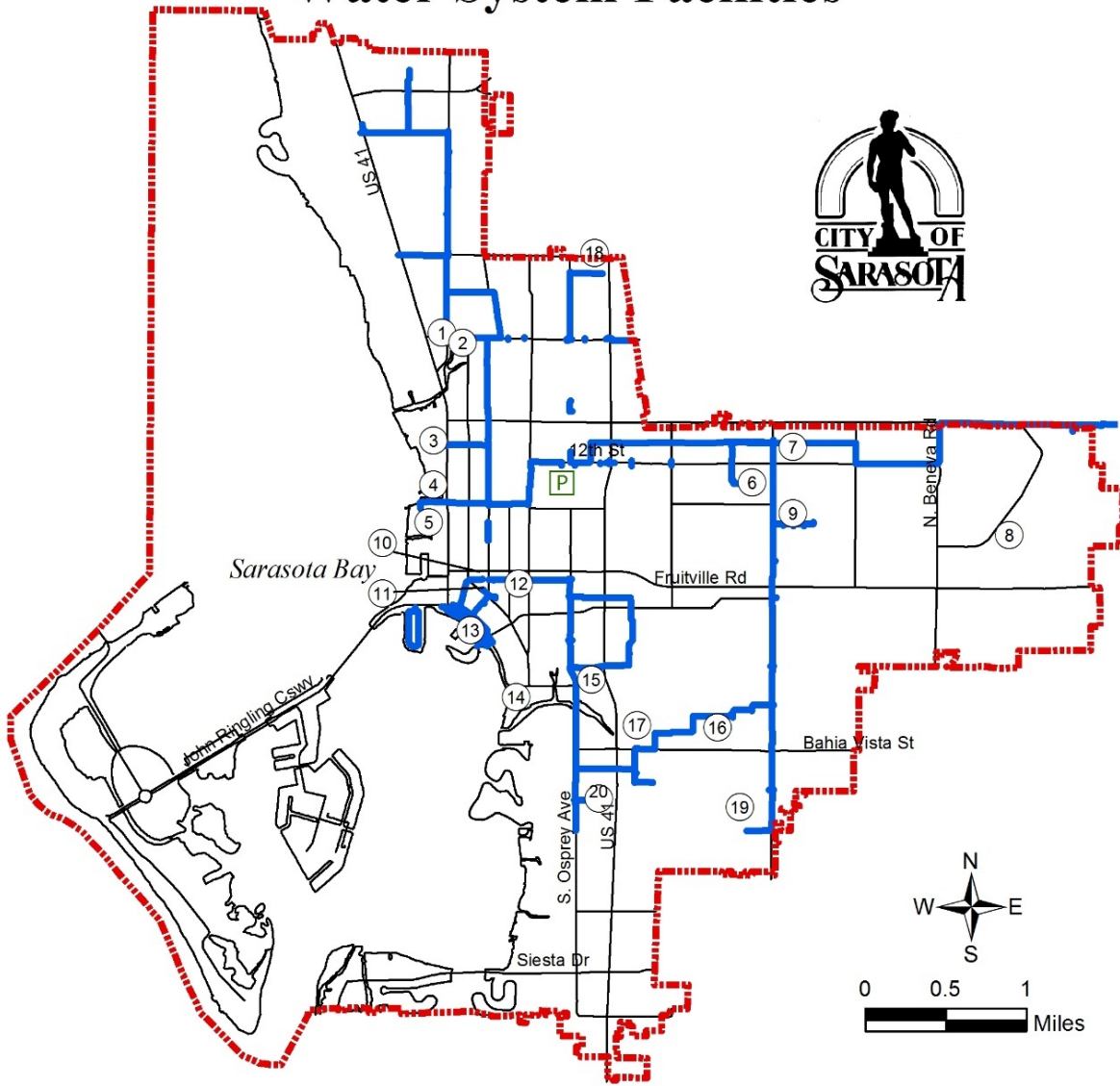
Phase II modified the wastewater treatment process raising the level of treatment to advanced, providing for more efficient solids and nutrient removal, and improving both the quality of the reclaimed water and the effluent discharged to the back-up surface water outfall.

Phase III began in 1992 with the first of several projects cooperatively funded through the Southwest Florida Water Management District and its Manasota Basin Board building an urban reclaimed water transmission system within the City of Sarasota. Approximately 13 miles of transmission mains and a pump station have been constructed. Urban reclaimed water usage relieves the potable water system of irrigation demand and provides groundwater users in the coastal area with a high quality alternative to well water. The urban system currently provides an average 700,000 gallons per day to these customers. The City continuously expands and improves the reclaimed water system in order to serve medians, parks, public facilities, and other uses. The potential for growth of the urban system is great and this phase of the reclaimed water project will continue to be emphasized in the City's reclaimed water plan. The use of reclaimed water is very important to the City as reclaimed water usage offsets the need to use potable water, especially for irrigation purposes. SWFWMD estimates that the further expansion of reclaimed water can offset the use of 3.05 million gallons of potable water per day. Reclaimed water is also discussed under Wastewater.

Enforced Reductions

The City of Sarasota has reacted to declarations of water shortage by the SWFWMD. The declarations of water shortage and enforcement of mandatory water use restrictions have had a significant impact on water use within the City of Sarasota. Peak demands due to irrigation reaching 125% of average daily demand were not uncommon during the dry season prior to the first use of restrictions in the 1980s. Irrigation peaks at an average 106% of average annual demand. The implementation of permanent year-round water use restrictions has made awareness of this aspect of water conservation a part of daily life in southwest Florida.

Illustration U-2A
**Utilities - Urban Reclaimed
 Water System Facilities**



- P Urban Reuse Master Pump Station
- City Limits
- Major Streets
- Reclaimed Water Sites
- Urban Reclaimed Water Line

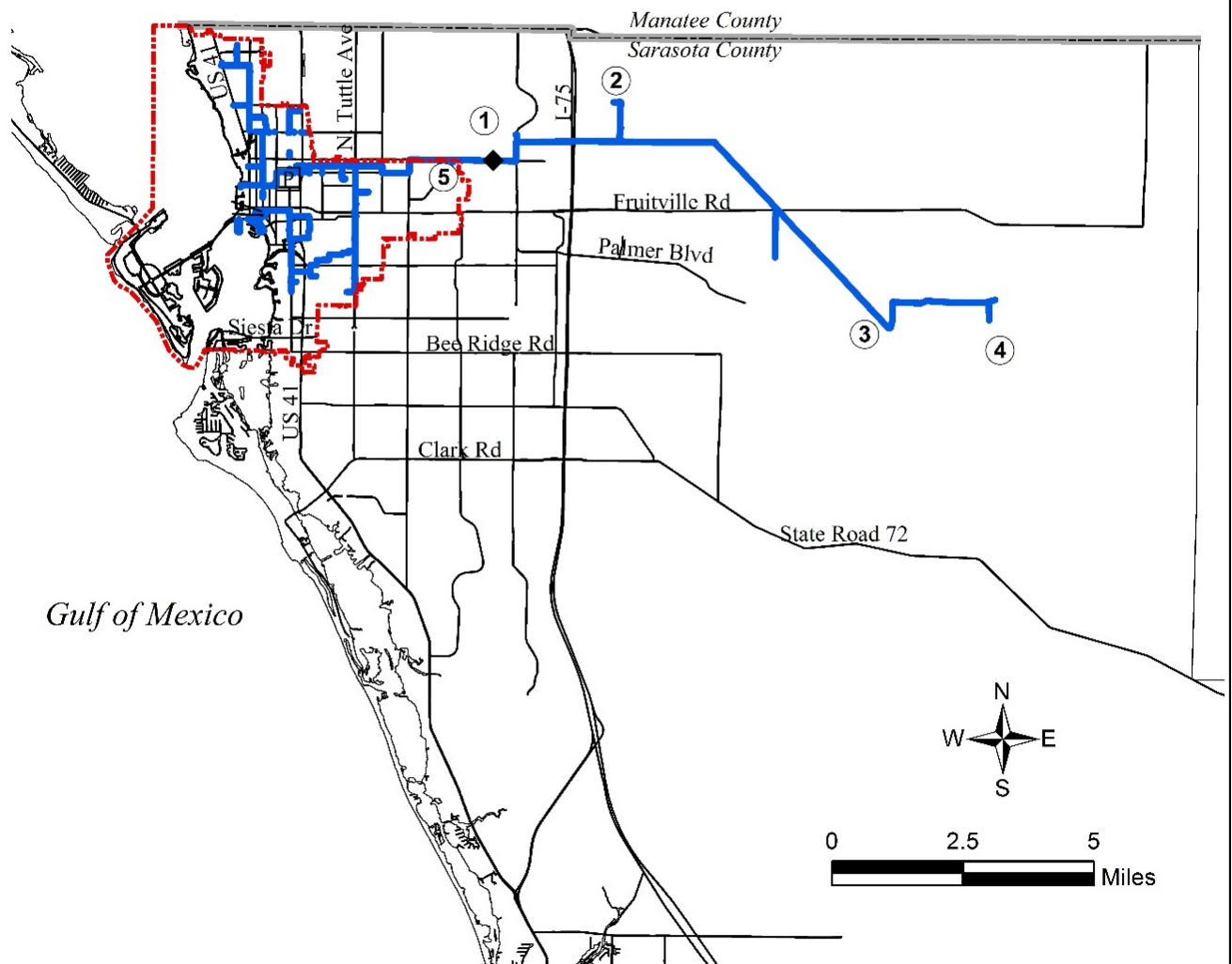
Source: City of Sarasota Utilities Department, July 2017

Illustration U-2A (continued)
Urban Reclaimed Water System Sites

Existing Sites, 2017	
1	Ringling College of Art and Design
2	Dr. Martin Luther King, Jr. Park
3	Whitaker Gateway Park
4	Centennial Park
5	Civic Center
6	Ed Smith Stadium
7	Youth Athletic Complex
8	Bobby Jones Golf Course
9	Tuttle Elementary School
10	Selby Public Library
11	Selby Five Points Park
12	City Hall
13	Bayfront Park
14	Selby Gardens
15	Luke Wood Park
16	Alta Vista Elementary School
17	Sarasota High School
18	Robert L. Taylor Center
19	Arlington Park
20	Sarasota Memorial Hospital

Illustration U-2B

Utilities - Agricultural Reclaimed Water System Facilities



- P Agricultural Reclaimed Water Master Pump Station
 City Limits
 Major Roads
- Interconnect with Sarasota County
- Agricultural Reclaimed Water Sites

Source: City of Sarasota Utilities Department, July 2017

Illustration U-2B (continued)
Agricultural Reclaimed Water System Sites

Existing Sites, 2017	
1	The Meadows Golf Course
2	Braden River Utilities – Lakewood Ranch
3	Hi Hat Ranch
4	City Owned Property
5	Bobby Jones Golf Course

Coordination of Water Supply Planning Efforts

The City primarily coordinates its water supply planning with two organizations which are the Southwest Florida Water Management District and the Water Planning Alliance.

Southwest Florida Water Management District

The Southwest Florida Water Management District (SWFWMD) is responsible for managing and protecting water resources in west-central Florida. SWFWMD’s job is to ensure adequate water supplies to meet the needs of current and future users while protecting water and related natural resources. The Water Management District encompasses all or part of 16 counties, from Levy County in the north to Charlotte County in the south. It extends from the Gulf of Mexico east to Polk and Highlands counties. The District contains all of parts of 16 counties spread over approximately 10,000 square miles, with total population of approximately 4.7 million people in 2016.

SWFWMD has goals for each of its areas of responsibility. These goals are:

- Water Supply – Ensure an adequate supply of the water resource for all existing and future reasonable and beneficial uses, while protecting and maintaining water resources and related natural systems.
- Flood Protection – Minimize flood damage by optimizing and maintaining storage and conveyance in natural and built systems, and by encouraging appropriate locations and design standards for growth.
- Water Quality – Protect water quality by preventing further degradation of the water resource and enhancing water quality where practical.
- Natural Systems – Preserve, protect and restore natural systems in order to support their natural hydrologic and ecologic functions.

The governing board of the SWFWMD approved the most recent Regional Water Supply Plan (RWSP) in November 2015. The RWSP is an assessment of projected water demands and potential sources of water to meet these demands for the period from 2015 through 2035. The RWSP encompasses a 10-county area where existing groundwater withdrawals are causing impacts to water and related natural resources. According to the RWSP, there are sufficient alternative sources of potable water other than ground water from the Upper Floridan aquifer to meet demand. Alternative sources include surface water, reclaimed water, desalination, and conservation. The RWSP identifies current and future needs and water supply sources to meet those needs. The RWSP consists of four geographically-based volumes that correspond to the District's four designated water supply planning regions: Northern, Tampa Bay, Southern and Heartland. Sarasota is located in the Southern Planning Region. This potable water section of the Utilities Chapter is written to be consistent with and to further the policies within the RWSP.

SWFWMD's Southern Water Use Caution Area (SWUCA) encompasses approximately 5,100 square miles including all or part of eight counties, including Sarasota County, in the southern portion of the District. Existing groundwater withdrawals from nearly 6,000 water use permits are causing saltwater intrusion into the aquifer, lowered flows in the upper Peace River and lowered lake levels along the Lake Wales Ridge. In some cases, actual flows and levels are below minimums adopted by the district. In 2006, the Governing Board approved a Recovery Strategy for the area and associated rule revisions. The Recovery Strategy calls for the development of alternative water supplies (surface water, reclaimed water, conservation, etc.) to meet growing water needs and to offset reductions in existing groundwater withdrawals, and the implementation of various restoration projects. Alternative water supply development projects have been identified through coordinated regional water supply planning efforts with local governments and others in the area. The goal of the Recovery Strategy is to restore actual flows and levels to adopted minimums by 2025 and ensure adequate water supplies for all reasonable and beneficial water uses.

The agricultural industry is the largest user of water in the Southern Water Use Caution Area. SWFWMD has worked with the agricultural community to develop the Facilitating Agricultural Resource Management Systems (FARMS) Program in order to decrease future groundwater withdrawals. Water for public domestic consumption is the second largest use of water in the district.

SWFWMD has identified alternative water supply projects that could be implemented in order to reduce groundwater usage. The RWSP states that individual water users/providers may choose to pursue the identified projects that best fit their needs.

Water Planning Alliance

The Water Planning Alliance (WPA) is a voluntary planning body of local governments located within SWFWMD's Peace River/Manasota Regional Water Supply Authority's planning area. Its membership includes Charlotte, DeSoto, Manatee, and Sarasota counties; the cities of Arcadia, Bradenton, North Port, Palmetto, Punta Gorda, Sarasota, and Venice; the Town of Longboat Key; and the Englewood Water District.

The Water Planning Alliance recently completed a Regional System Planning and Engineering Study with the purpose of identifying and demonstrating the feasibility of water supply options that could meet the potable water supply needs of member governments through the next 20 years. The study was completed in two phases and produced a plan that identified a prioritized list of water supply development options. This project built upon the planning level work in the Water Management District's Regional Water Supply Plan by producing a more detailed analysis of the water supply options at the regional and local levels. This information was used by Water Planning Alliance members to determine water supply development priorities for the region. Those water supply options that met SWFWMD's permitting criteria were included in the Regional Water Supply Plan.

Water Facilities Financing

The City utilizes several methods for funding the supply of potable water to its citizens. The five-year schedule of capital improvements identifies the source of funds for each project that the City plans to undertake. Funding methods include:

- User fees – A fee charged for the consumption of water. The user fee for potable includes a base unit charge and a fee per gallonage of water consumed.
- Connection fees – A fee charged for a structure to connect to the utility system. The City's connection fees range from \$325 for a 5/8-inch line to \$2,500 for a 4-inch line. The fee for larger lines is the actual cost of the connection.
- Impact fees – A fee charged for the expansion of government infrastructure or service that is necessary to serve new development. The City's potable impact fees range from \$900 for a 5/8-inch line to \$72,000 for an 8-inch line.
- Revenue bonds – Municipal bonds are the borrowing of money with a guaranteed repayment plus interest from revenues generated by a specified revenue-generating activity associated with the purpose of the bonds.
- Grants – Money that is granted to the City by either the Federal or State agencies is allocated with specific provisions on the way the funds are to be spent. Typically, there are no grant opportunities for operations or capital reinvestment. The City may have opportunities for future grants for development of alternative water sources.

Conservation Education Activities

Water treatment plant tours are given to school and civic groups upon request. As a part of each tour, issues relating to water conservation and the regional perspective are discussed. Handouts and brochures are made available providing additional information on water conservation topics. Speakers are available to address groups outside the context of a plant tour.

The City's water billing system allows for insertion of a brief message in the body of the bill. This space is frequently used for a water conservation bullet. At least annually, a bill insert is prepared that focuses on a water conservation issue.

Impacts on Natural Resources

Threats to natural resources from potable water systems generally result from over-pumping which depletes the water supply, or contamination of the groundwater supplies. Land use restrictions in areas adjacent to well fields or in areas known to be aquifer recharge areas can help protect potable water sources from contamination. Regulations that address maximum well field withdrawal rates protect potable water supplies from depletion. In addition, water conservation programs reduce demand for potable water supplies.

The City coordinates with Sarasota and Manatee Counties, SWFWMD, and the Florida Department of Environmental Protection to ensure the protection of well fields. The well fields are protected by Sarasota County Wellhead Protection Ordinance #92-079 and Manatee County Zoning Ordinance Section 738, in addition to Florida Department of Environmental Protection Rule 62-521, July 1995.

SWFWMD regulates the withdrawal of groundwater through the issuance of water use permits which specify maximum withdrawal rates and limit the potentiometric change in water tables. In addition, conservation measures that include reductions in water consumption and reclaimed water have been established by SWFWMD in coordination with the water use permit process.

According to the Southwest Florida Water Management District, demands on ground water supplies in the eastern Tampa Bay area are exceeding or threatening to exceed sustainable yields. The Southwest Florida Water Management District has formed water use caution areas. These are created by the Governing Board of the SWFWMD when it determines that regional action is necessary to address cumulative water withdrawals which are causing or may cause adverse impact to water and related resources. This action allows the Board to then adopt rules and impose special requirements to address problems with the water use caution area.

Aquifer Recharge Areas

SWFWMD has identified aquifer recharge areas to the intermediate aquifer system within the City limits. These range from areas of "no recharge" to areas of "no to very low recharge" (0-2.0 in/yr.). The areas of no to very low recharge occur in the eastern portions of the City.

SWFWMD has identified no recharge areas for the Upper Floridian aquifer within the City of Sarasota. However, areas of no to very low recharge occur in Sarasota County in the vicinity of the City-owned Verna well field. Sarasota County's Comprehensive Plan recommended that the County adopt land development regulations that would guarantee the integrity of these areas. These regulations were adopted. The City will continue to coordinate with the County to ensure the protection of recharge areas.

Emerging Issues

The City is in the position of having uncommitted excess potable water treatment capacity. This is due to conservation measures and service area demographics. As reclaimed water becomes more widely available for irrigation, there may be a further decrease in potable water demand. The urban and agricultural reclaimed water systems are shown in Illustrations U-2A and U-2B. Reclaimed water is discussed under Wastewater.

Projected water demand is expected to remain within the capacity of the water supply, treatment, and distribution system. Residential use currently accounts for 72% of the ERU's served. Water use restrictions of the water management district and water conservation efforts in general will continue to exert a downward force on residential rates of consumption. (See discussion under Effluent Disposal below.) Development must be assessed on a project basis having the greatest impact on the distribution system infrastructure intended to serve the development rather than the treatment capacity of the system. Annexation of areas requiring significant water service is unlikely since the unincorporated area surrounding the City is served primarily by a central water supply administered by Sarasota County.

The projects included in the Capital Improvements Chapter have been identified to maintain the adopted level-of-service. On the basis of the above information, sufficient potable water capacity exists to serve the needs of the City through the planning period.

Water Supply Facilities Work Plan (Fiscal Years 2017/18 - 2026/27)

Sub-section 163.3177 (6)(c), Florida Statutes, requires local governments to adopt a Water Supply Facilities Work Plan into the comprehensive plan. The Water Supply Facilities Work Plan is to be updated every 5 years within 18 months after the governing board of the Southwest Florida Water Management District approves an updated regional water supply plan. The Water Supply Facilities Work Plan is to contain supply projects necessary to meet the water needs of the city to serve existing and new development. Water supply projects may include traditional, alternative, and conservation projects covering at least a 10-year planning period. The City's Work Plan covers the fiscal years 2017-18 through 2026-27.

In 2008, the Utilities Department projected that an additional 1 MGD of potable water was needed by 2015, however that projected demand did not occur. Increased demands in the future can be met through a combination of Utility improvements including continued conservation methods, by greater use of alternative water sources, such as reclaimed water, and through expansion of the City's groundwater well fields and water treatment facilities.

An increased use of reclaimed water could offset the use of potable water for such uses as irrigation. An expansion of the reclaimed water system could be consistent with SWFWMD's Regional Water Supply Plan which indicates that the City's reclaimed water system could be expanded between 2017 and 2035. SWFWMD projects that expansion of the reclaimed water system may offset up to 1.05 million gallons of potable water usage per day. Further, SWFWMD projects that the cost to expand the reclaimed water system would be approximately \$12,090,000. This project is the only one identified for the City in the Regional Water Supply Plan. The City plans to take advantage of any funding opportunities available through SWFWMD to fund the expansion of the reclaimed water system.

In 2017, the City estimates that approximately 20 billion gallons of potable water usage in the Sarasota area may be offset through reuse and conservation programs during the 10-year planning timeframe through the Utilities Department's reclaimed water program and conservation practices in the City. The City's reclaimed water is distributed to numerous sites that are identified in Illustration U-4, Permitted Reclaimed Water Capacity Summary. In order to expand the use of reclaimed water in the area, in September 2010, the City entered into a twenty-year agreement with Braden River Utilities to provide reclaimed water to serve residential and commercial users in the southwestern sector of Lakewood Ranch. The City supplies up to 2 million gallons per day during the months of June, July, and August and not less than 4 million gallons per day, if available, the remaining months of the year. The agreement provides that Braden River Utilities will accept and purchase a minimum of 3.5 million gallons of reclaimed water per day on an annual average daily basis and that the City will provide up to an average annual flow up to 5 million gallons per day.

As identified in the Future Land Use Chapter, the City has less than 5 percent of land area that is vacant while 15 percent of land is for recreation, conservation and open space purposes. The remaining 80 percent of land is developed. As a mature, urban city, development within the city consists primarily of redevelopment where existing structures are either demolished and new structures built, or existing structures are improved through remodeling. New structures and substantially remodeled structures are required to comply with the latest codes which require new

water conserving plumbing fixtures. As redevelopment occurs, older plumbing fixtures are upgraded to newer fixtures with greater water conserving properties.

Expanding the reclaimed water system may not be the only improvements to the Utility system required to meet projected demands. All utilities that produce reclaimed water for irrigation must accommodate the business model that when reclaimed water is in highest demand, during the dry season, there is the least amount of reclaimed water being produced. Adding additional storage to the City's reclaimed water system to contain reclaimed water during the wet season for use during the dry season may not be practical or economical. The City will need to compare the cost/benefit of expanding the reclaimed system with the cost/benefit of producing more potable water at the Water Treatment Plant to meet the projected demand. Most likely, a combination of improving the reclaimed water system and increasing the potable water production will be needed to meet future demand.

Within the next five years, the Utilities Department will be evaluating modifications to the potable water system in order to meet new standards relating to total dissolved solids (TDS). The TDS concentration is a secondary drinking water standard and, therefore, is regulated because it is more of an aesthetic rather than a health hazard. The Utilities Department anticipates that treatment of water from the Verna well field will need to be modified in order to meet the TDS standard, and that a capital improvement project will need to be programmed within the next three years to fund a study that will be followed by design and construction.

The balance of work projects related to the potable water system is maintenance related. The projects scheduled for Fiscal Years 2017-18 through 2026-27 include:

- Ongoing city-wide transmission/service main upgrade/replacement/extension – to replace or upgrade antiquated equipment and extend to provide service to new development.
- Ongoing upgrade/replacement of valves in the distribution system to replace antiquated equipment.
- Ongoing upgrade or relocation of water distribution pipes to accommodate road/drainage improvement projects.
- Upgrade/maintenance to the Utilities 12th Street complex. Projects include adding more storage space with a new warehouse, remodeling the Utilities Administration building, and repairing/remodeling water treatment plant tanks, walls, and slabs.
- Potable water transmission and distribution main upgrades/replacements/extensions for Osprey Avenue Phase 5 from Bay Street to Novus Street and to serve the new St. Armands Circle parking garage.
- Cross connection control – residential loan program.
- Improvements to Administrative buildings – remodeling the Administration building Phase 1 – east side; Phase 2 A/C for restrooms; Phase 3 – conversion of store room to offices; construct

concrete block building for a materials warehouse with 2nd floor offices and converting current LS office to storage.

- Relocation of filter housings at Water Treatment Plant to improve water quality.
- Replace two brine filters at reverse osmosis plant – operational maintenance for the facility.
- Install sand filters at RO Water Treatment Plant for Verna raw water quality improvement – to prepare water for membrane treatment and improve water aesthetics.
- Replace existing isolation valve in the high service manifold piping and construct tie-in to Verna raw water line for emergency water line – to upgrade equipment and improve efficiency of operations.
- Upgrades to data control system at the water treatment plant – to improve facility operations.
- Install VFDs on high service pumps 1 and 3 and replace antiquated RO Plant 480 V MCC with updated switchgear.
- Reclaimed water transmission and distribution main upgrade/replacement/extension – to upgrade critical and aging infrastructure as necessary.
- Reclaimed water main relocation/upgrade to accommodate proposed roadway/drainage projects.
- Verna 30” raw water main reliability improvements (Verna to WTP) – future project to maintain Verna to water treatment plant water main transmission.
- Create a Water Production Facilities Master Plan with the study beginning in 2020. This plan should also identify new conservation techniques the City can employ to reduce potable water usage. Consideration should be given to revising regulations providing for more efficient equipment and plumbing fixtures as part of the planning process, such as WaterSense rated fixtures or promotion of or participation in the Florida Water Star certification program.

Those projects associated with maintaining and improving the potable water system are identified in the Five-year Schedule of Capital Improvements (Illustration CI-7) adopted in the Capital Improvements Chapter. As new projects are developed, Illustration CI-7 will be amended to include those projects, estimated costs, sources of funding, and projected work years.

The City may also evaluate additional sales of bulk reclaimed water to other utilities in the future so that potable water usage may be reduced in adjacent areas.

WASTEWATER

The City of Sarasota operates an integrated wastewater system. There are no private wastewater facilities in the City of Sarasota. All facilities are public and are managed by the City's Utilities Department. In December of 1996, 89 properties along Tamiami Trail south of Bee Ridge Road were annexed into the City. These properties had septic systems, but construction of sewer to serve the area has been completed. Illustration U-3 shows the City's wastewater facilities.

The land use types served by the City include residential, commercial, industrial, and community facilities. The City classifies over 99 percent of users as domestic (sanitary sewage from residences, businesses and institutions) and less than 1 percent as industrial users (liquid waste from industrial manufacturing processes, trade or business as distinct from sanitary sewage).

Facility Analysis

The City's wastewater treatment plant, located on 12th Street between Orange Avenue and U.S. 301, dates back to 1951. Expansions in 1971, 1986, and 1990 increased total treatment capacity to 10.2 MGD (Million Gallons per Day) annual average daily flow.

The sewage collection system covers more than 99 percent of the developed City service area. Gravity collection pipes to pumping stations provide flow through force mains to the central wastewater treatment plant. The current treatment process is Advanced Wastewater Treatment (AWT), which is typically distinguished from other levels of treatment by the inclusion of biological/chemical nutrient removal. Residuals are mechanically dewatered to approximately 20% solids content and transported off-site to Charlotte County Bio-Recycling for composting and ultimate disposal. Wastewater flow received at the plant is primarily of domestic origin. Highly treated effluent from the treatment plant, known as Reclaimed water, is used for irrigation of agricultural and recreational areas including Urban Residential Customers, Bobby Jones Golf Course, Meadows Golf Course, Hi Hat Ranch, and Lakewood Ranch. Excess wet weather flow that cannot be used for irrigation or otherwise stored is disposed of in the Deep Injection Well (DIW) at the 12th Street Campus.

Level-of-Service

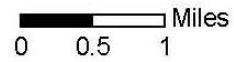
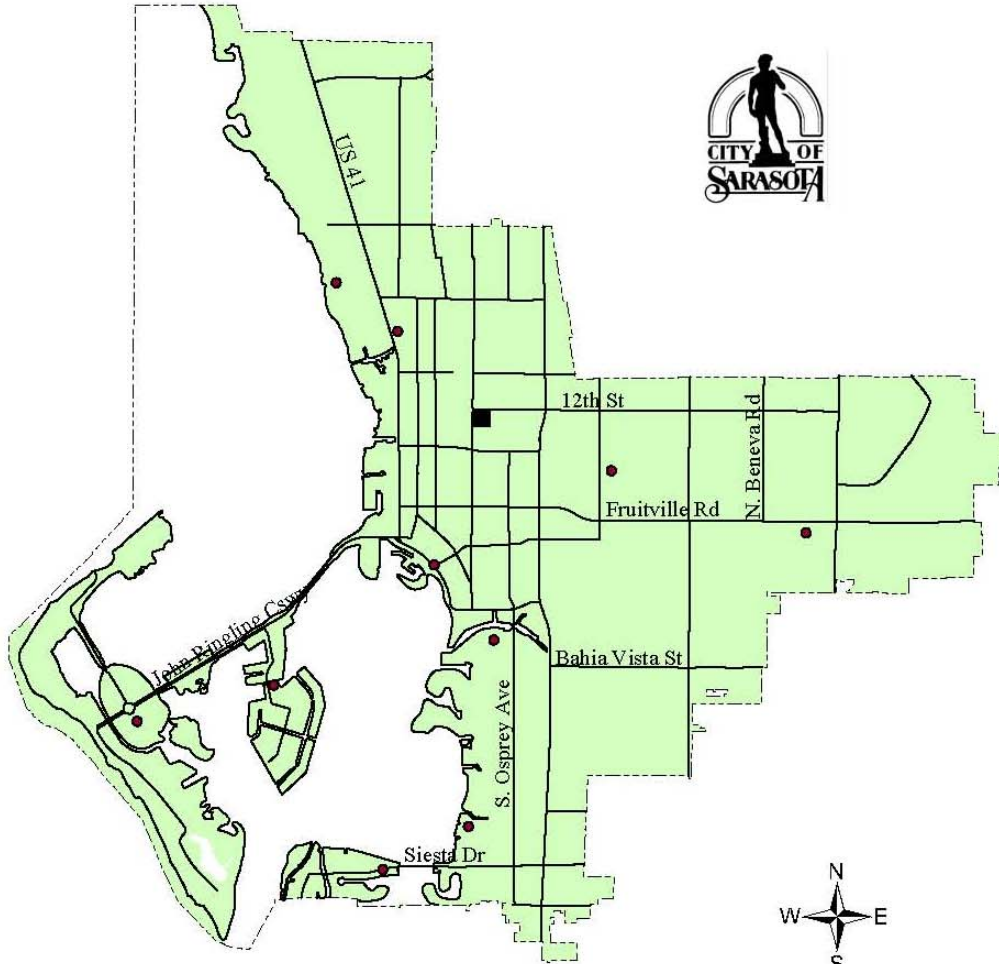
The City is in the unique position of having uncommitted excess wastewater treatment capacity. This is due to the rehabilitation program of the wastewater collection system, conservation measures, and service area demographics.

In the 1989 *Sarasota City Plan*, a service level of 150 gallons per capita per day was adopted. Projected needs were based on "functional population" which included residential and seasonal population, but not daily visitors and commuters to the City as does the "functional population" for this update of the *Sarasota City Plan*. Many people in the "functional population" have little or no impact on sewer demand. For example, someone who enters the city limits, shops, and then leaves is

considered to be part of the “functional population”, yet will use little or no wastewater service during the shopping visit. Another example would be someone who lives outside the city limits and works inside the city limits. In aggregate, such individuals have an impact on wastewater service, but individually do not have the same impact as a full-time or seasonal resident of the city. To illustrate this point, the average of the “In Season Functional Population” and “Out of Season Functional Population” in 2016 was 63,997 and the average of these respective annual daily potable water flow recorded at the potable production facility for the year ending April 30, 2016 was 6.16 MGD. Dividing 6.16 MGD by 63,997, this works out to a demand of slightly less than 97 gallons per capita per day, slightly more than 53 gallons per capita per day below the adopted level-of-service.

Illustration U-3

Utilities - Wastewater Facilities



- Water Treatment Plant
- Lift Station
- Major Streets
- - - City Limits

Source: City of Sarasota Public Works Department, 2003

Utility planners have come to recognize the sometimes arbitrary nature in the derivation of a “functional population” that accurately describes patterns of sewer use for different segments of the population. The term “equivalent residential unit” (ERU) has been developed to more accurately define an amount of water or wastewater demand that is equivalent to that used by a typical single-family residence. The City of Sarasota defines an ERU as a residential billing unit such as a single-family residence, apartment unit, condominium unit, or commercial consumption equal to 6000 gallons of wastewater service used per month. The ERU is specific to the utility system being described factoring the differences among users into the calculation. The ERU becomes the common denominator in facility needs planning and utility rate sufficiency analysis. Therefore, the units of level-of-service have been changed from gallons per capita per day to gallons per ERU per day.

Some other jurisdictions such as Sarasota County and the City of Venice have a level-of-service based on ERU’s. Records of the number of ERU’s served are reflected in the number of unit service charges tallied by the City’s Utility Billing Office. The City of Sarasota considers 200 gallons per day per ERU as adequate treatment capacity and was provided by the City’s consulting engineer of record, Post, Buckley, Schuh & Jernigan, Inc. The average annual sewer use recorded at the wastewater treatment plant for the year ending September 30, 2002 was 6.4 MGD. The number of ERU’s served for the same period of record was 37,110 which at 200 gallons per day per ERU equates to an LOS required of 7.422 MGD. Wastewater flow as measured at the treatment plant is affected by rainfall and 2002 was drier than normal. The average daily flow for the five (5) year period of 1998 through 2002 was 7.1 MGD. Given consideration of the annual fluctuation in wastewater flow due to weather conditions, the demand on the system is well within its capacity.

Effluent Disposal

The City is permitted by the Florida Department of Environmental Protection, under permit number (FL0040771-01), to operate its wastewater treatment system. The wastewater disposal system relies upon the use of reclaimed water, back-up surface water discharge to Whitaker Bayou, and discharge to Deep Injection Well, as needed. The system has 180 million gallons of storage in a surface impoundment. The reclaimed water capacity of 8.12 MGD is summarized in Illustration U-4 below.

Illustration U-4 Permitted Reclaimed Water Capacity Summary

Site Identification	User Type	Area (acres)	Capacity (mgd)
I. Reclaimed Water Sites			
1. Bobby Jones Golf Course	GC	265	0.50
2. Meadows Golf Course	GC	195	0.52
3. Ed Smith Stadium	P	35	0.07
4. Glen Oaks	R	14	0.05
5. Aggregate Urban Reclaimed within City Limits	A, H, L, O, R	800	0.5
6. Hi Hat Ranch Utopia Grove	C	500	0.60
7. Hi Hat Ranch Old Grove	C	400	0.30
8. Site III City Owned Property	AG, E	850	1.32
9. Hi Hat Ranch Ridge and Furrow Area	AG, E	2,500	3.50
10. Braden River Utilities – Lakewood Ranch	R, CO		5.00
Total	---	5,559	12.36

Notes:

- A-Aesthetic Purposes
- AG-Agricultural Use
- C-Citrus
- CO-Commercial
- E-Edible Crops
- GC-Golf Courses
- H-Highway Medians/Rights of way
- L-Landscaped Areas
- P-Parks & Playgrounds
- R-Residential
- O-Other (cooling towers)

SWFWMD is assisting local governments in Sarasota and Manatee Counties with development of a regional system of interconnections among their reclaimed water systems in order to maximize the potential usage for wet weather storage and dry weather retrieval of reclaimed water. The City of Sarasota and Sarasota County Reclaimed Water Systems are interconnected.

Areas without Wastewater Service

There are approximately 17,000 accounts with wastewater service which serve nearly all of the approximately 27,000 platted parcels within the City. There are 335 parcels scattered about the City which do not have wastewater service. The location of these parcels is available from the Utilities Department.

These parcels represent less than one percent of the total parcels in the City, and are generally either undeveloped or have working septic tanks that for reasons of cost/benefit effectiveness were not included in the unsewered areas project. That project addressed the areas of the City where septic systems were found to be inappropriate by reasons of environmental or health concerns. The City does not intend to undertake a program to provide wastewater service to these remaining parcels, but will provide service to those parcels on a case by case basis to meet the needs of the property owners or coincidentally with other capital improvements to the collection system.

Impacts on Natural Resources

Water quality in Sarasota Bay and Whitaker Bayou has historically been impacted by the disposal of treated effluent from the City's wastewater treatment plant and stormwater runoff into Whitaker Bayou. Violations of the State dissolved oxygen standard had been noted and there was a significant reduction in coverage by seagrasses. Violations of Florida's water quality standard for transparency have also occurred.

To the extent the above problem is related to point-source discharge, the City has effectively addressed this through its urban and agricultural reclaimed water program and the upgrading of the wastewater treatment process to provide AWT. Data collected by the Sarasota Bay Project of the National Estuary Program has documented improvements to water quality in Sarasota Bay and a regrowth of submerged aquatic vegetation has been noted at the mouth of Whitaker Bayou. Although the discharge of excess reclaimed water to Whitaker Bayou is permitted by the Florida Department of Environmental Protection as a back-up disposal method, it is the City's objective to continue development of the reuse system to minimize dependence on the back-up discharge.

Emerging Issues

The current sewer treatment capacity is 10.2 MGD annual average daily flow, 13.0 MGD maximum 30 day average flow in the peak month, and 26.0 MGD maximum daily flow for the peak day. Flows have not exceeded these capacities and would probably only do so if a major hurricane were to strike the area. Precipitation, especially in great volumes that accompanies tropical storms, increases the flow through the wastewater treatment plant. When stormwater flows through the streets, leakage occurs around the perimeter of manhole covers. Also, people sometimes remove manhole covers to relieve flooding of neighborhood streets which allows even more stormwater to enter the wastewater system.

Another way in which stormwater enters the wastewater system is through older sewer laterals which are made of vitrified clay with a bituminous lining. Unlike PVC pipe, these materials crack more easily with age. When heavy precipitation occurs, the ground becomes saturated and stormwater infiltrates the cracked pipes, thereby flowing into the wastewater system. To address these inflow and infiltration control issues, the City allocates approximately \$2 million each year on a program to control inflow and infiltration. It remains a budget priority in the capital improvement plan and without it the City likely would not be in a position to benefit from the extra treatment capacity.

Projected sewer demand is expected to remain well within the capacity of the wastewater collection, treatment, and reclaimed water system. Residential use currently accounts for 77% of the ERU's served. Development must be assessed on a project basis having greatest impact on the collection system infrastructure intended to serve the development rather than the treatment capacity of the system. Annexation of areas requiring wastewater service may account for a significant future wastewater service demand which will be subject to review on a project basis.

The projects included in Capital Improvements Chapter have been identified to maintain the adopted level-of-service. On the basis of the above information, sufficient wastewater treatment plant capacity exists to serve the needs of the City through the planning period 2022.

STORMWATER DRAINAGE

In 1989, the City joined with Sarasota County through an interlocal agreement to form the Sarasota County Stormwater Environmental utility to perform stormwater management. The Utility's responsibilities include administration, basin planning, operations, maintenance, repair and capital improvements.

The City of Sarasota's stormwater drainage facilities consists of a system of natural and manmade conveyance and retention/treatment systems. Upstream facilities are predominantly paved streets and gutters. These drainage features receive overland flow that generally serves as tributaries to intermediate facilities such as storm sewers, culverts, and ditches. These intermediate facilities in turn serve as tributaries for larger natural drainage features such as Whitaker and Hudson Bayous, Phillippi Creek, and Sarasota Bay.

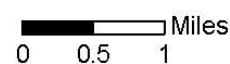
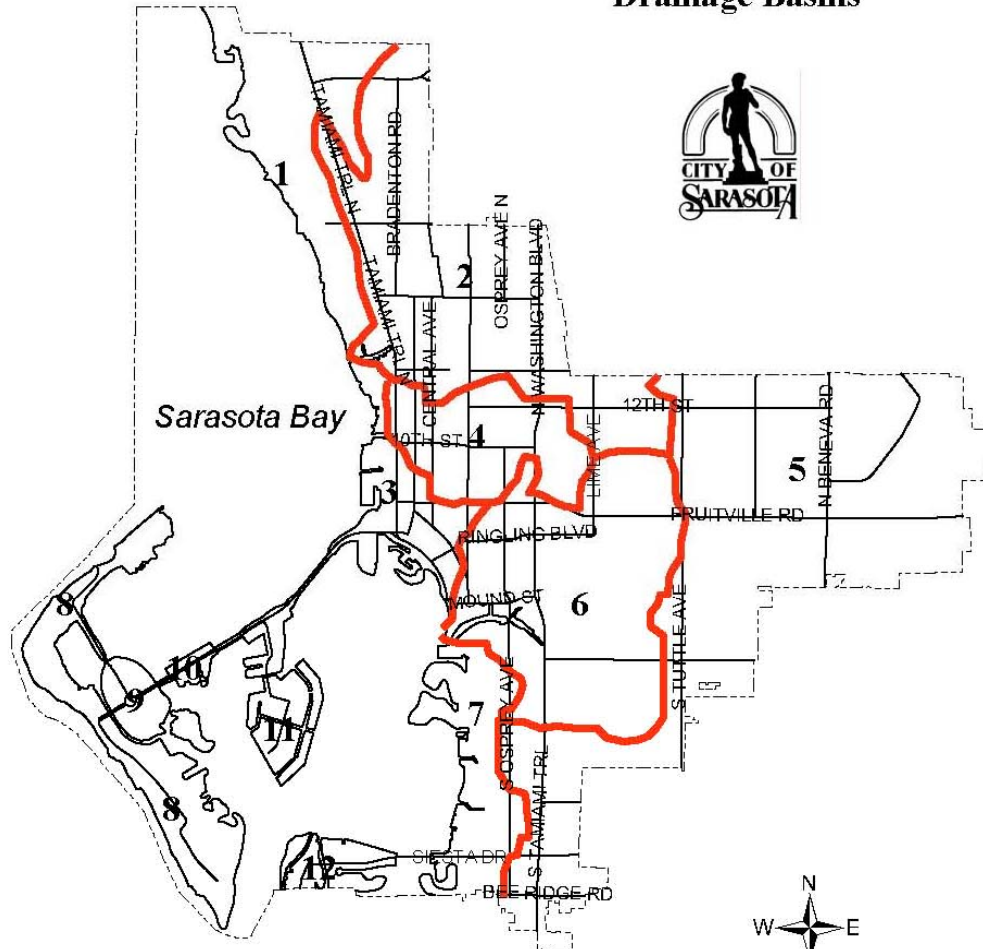
The City-Wide Drainage Master Plan was completed in 1987 and provides an analysis of the drainage facilities for the mainland basins of the City. In January 1989 the City adopted the Engineering Design Criteria Manual (EDCM) which provides storm drain design criteria including design storm requirements. The following analysis and levels of service information were taken from these two sources.

Facility Analysis

The City is divided into 12 drainage basins within the corporate limits as delineated on Illustration U-5. Seven of these are mainland basins and 5 are located on the barrier islands. The City-Wide Drainage Master Plan provides facility capacity calculations by analyzing full flow in closed storm sewer systems and open channel systems. The estimates of peak flow for the City's basins were calculated using general topography, land use patterns, and a design rainfall intensity. Anticipated peak flow was subtracted from estimated facility capacity to produce residual facility capacity, defined as the excess capacity of a facility to carry additional flow above estimated peak conditions.

The residual capacity for each basin was summarized and used to estimate service levels for each basin which included 10-year projected conditions to 1999. See discussion under Emerging Issues below.

Illustration U-5
Drainage Basins



- | | | |
|-------------------------|---|--|
| <p> Basins Boundary</p> | <ul style="list-style-type: none"> 1. North Trail Coastal 2. Whitaker Bayou 3. Bayfront Coastal 4. Business District 5. Phillippi Creek 6. Hudson Bayou | <ul style="list-style-type: none"> 7. Osprey Coastal 8. Lido Key 9. St. Armands Key 10. Coon Key 11. Bird Key 12. Siesta Key |
|-------------------------|---|--|

Source: Citywide Drainage Master Plan, 1987

Design Storm

A design storm is a model rainfall event that can be used as a major yardstick for quantifying runoff rates and volumes and is one of the most important factors in stormwater master planning. The design storm concept is developed using historical data from previous rainstorms. The parameters that define a particular design storm include frequency, duration, total rainfall volume or the particular frequency, and duration. Storm events with a recurrence interval of 100 or 50 years are generally too stringent for stormwater management in “built-out” urban areas because they are extreme events and would require very expensive retrofitting which would eliminate the feasibility of redevelopment. The City of Sarasota Engineering Design Criteria Manual has adopted the 25-year/24 hour (recurrence/duration) Design storm for use in the design of external drainage facilities and detention basins and infrastructure capital improvements. The 10-year/24-hour storm event has been adopted for the design of closed storm sewer systems for tributary drainage areas of 0-200 acres of internal subdivision drainage systems.

Level-of-Service

Level-of-service for stormwater management systems is a quantitative ranking, on a relative continuum from good to bad, for a given design storm. Good performance for an urban system such as the City's might be defined as flow contained within the gutter with no street flooding, while bad performance could be defined as structure flooding. Many areas, however, can tolerate a limited amount of street or yard flooding if it does not last very long and is not frequently experienced.

The level-of-service for stormwater management is established using storm design criteria in accordance with the Engineering Design Criteria Manual. The following levels of service are general in nature and will be applied using a 25-year/24-hour storm event.

LOS A:	Gutter flow only	LOS C:	Street and yard flooding
LOS B:	Street flow only	LOS D:	Street, yard and structure flooding

The City has adopted level-of-service C, street and yard flooding, as the level-of-service to which all external drainage facilities will be designed. To adopt a higher level-of-service would be cost prohibitive, as it would require an almost total replacement of the entire system.

On-site attenuation of stormwater is required so that any development or grading will not shed stormwater at a higher rate onto adjacent right-of-way or property than was discharged from the site in its pre-development or pre-redevelopment state. Areas being redeveloped only get a maximum credit of 40 percent for pre-existing impervious surface. Attenuation areas are to be designed in accordance with best management practices, per the Engineering Design Criteria Manual.

A stated Strategic Plan Goal of the City Commission is to be:

“An Economically Sustainable Community.”

This is interpreted to include promoting economic development of the City. In this regard, there has been some recent criticism from the development community regarding the requirements set forth in the EDCM. They indicate the cost of “retrofitting” sites that are being redeveloped is discouraging some economic development within the City. Counter to this argument is the concern of meeting concurrency regulations and the question of “*Why should City taxpayers burden the cost of replacing infrastructure when redevelopment is not required to update such for current needs of their own?*”

Another defining principle of the City Commission is:

“To be a financially responsible government providing high quality service and infrastructure.”

In an attempt to balance these concerns, the City should explore the feasibility of adopting various methods which address the required stormwater management while encouraging redevelopment efforts.

The City-wide Drainage Master Plan estimated facility capacity based on future land use changes indicated in the Impact Management Areas (IMA) of Land Use Appendix C in the 1989 Sarasota City Plan. The level-of-service for drainage was estimated assuming that: (1) all IMA land use changes would have taken place over the 10-year planning period, and (2) all recommended improvements per the Drainage Master Plan are implemented over the 10-year planning period. Given the above assumptions, the levels of service for the system were estimated as follows:

<u>LOS</u> <u>Attained</u>	<u>Percent of Total Basins</u> <u>1999</u>
A	44%
B	14%
C	17%
D	25%

The percentages for LOS C and D are different from those in the 1989 Sarasota City Plan, which contained a typographical error.

Impacts on Natural Resources

Stormwater runoff is the major non-point source of surface water pollution. Runoff may carry pollutants such as pesticides, fertilizers, and petroleum wastes from yards and roadways into receiving water bodies. Careless grading and inadequate drainage systems can increase topsoil and tributary erosion and also carry sediment into receiving water bodies.

A major source of water transparency violations currently occurring in Sarasota Bay are stormwater discharges with high levels of total suspended particulate. This type of pollution contribution would be expected to increase given increased growth and development trends in the region, unless controlled.

The City is reversing this trend and reducing non-point discharges of total suspended particulate through the enforcement of standards in the Engineering Design Criteria Manual. Those standards require on-site attenuation with filtration/treatment for all new construction projects as established by the Southwest Florida Water Management District. The City has joined in implementation of a drainage utility by consolidation with Sarasota County, as outlined in the Drainage Master Plan. All natural drainage features are either publicly owned or are controlled by City, State or Federal regulations. For example, docks are regulated by the City and any dredge or fill changes are regulated by the State. Natural drainage features in the City are subject to Environmental Resource Permitting of Surface Water Management Systems, administered by the Southwest Florida Water Management District, (Chapters 40D-4, 40D-40, 40D-45 and 40D-400, Florida Administrative Code). These permitting requirements address but are not limited to construction, alteration, or operation of surface water management systems.

Emerging Issues

The 1987 City-wide Drainage Master Plan estimated facility capacity for the 10-year planning period through 1999. To determine future service levels, a study will have to be done of the basins. Some of this work has already been completed. Through the interlocal agreement with Sarasota County, the Phillippi Creek Basin Study has been completed. The studies for Hudson Bayou Basin, Business District Basin and Whitaker Bayou Basin have also been completed. Work on the study of the remaining eight drainage basins has not yet begun.

Those studies which are complete have identified what actions are needed to provide a level-of-service C through the planning period, which will be the goal of all the basin studies. Funding sources for these actions will be determined by the County. It should be noted that in some areas of certain basins the laws of nature may prevent a level-of-service C from ever being attained.

SOLID WASTE

The Solid Waste Management Division of the Public Works Department plans, develops and implements a system of solid waste collection throughout the City that provides a level of service that protects public health and the environment while meeting the requirements of local, state and federal regulations. The division is also responsible for managing Recycling collection and disposal contracts and managing an interlocal agreement with Sarasota County for the purpose of disposing solid waste collected within the City's boundaries at their County Facility.

Facility Analysis and Level-of-Service

The City does not own nor operate any disposal facilities. The City of Sarasota provides residential and commercial solid waste trash collection within the City limits as State mandated. Recycling is an enhanced service the City provides to help reduce the waste stream going to the landfill. The City collects and disposes of residential recycling and Commercial properties recycle with a selected private vendor of their choice following their recycling plan that is provided to the City per City Code. Both City provided services, except commercial recycling, can be provided by in-house City staff, contractual vendors or a combination of both with the City reviewing the best efficient and effective way to manage at relevant points in time. Disposal of municipal solid waste is governed by an interlocal agreement between the City and Sarasota County that provides for the disposal at the County's Landfill.

The Solid Waste Management Division provides the following level of service for solid waste collection:

Residential – Once per week collection from a City supplied 95-gallon cart. Collection is performed with semi-automated and fully-automated trucks.

Commercial - Collection services range from 1 time per week to 6 times per week. Container sizes range from a 95-gallon cart up to a 40 yard roll-off compactor container.

Public Areas – Collection services are performed daily for street receptacles in the downtown area, St. Armands Circle, Southside Village and Dr. Martin Luther King business district along with assorted City parks.

Residential Recycling – Contracted service that provides curbside collection one time per week using a two-bin system.

Commercial Recycling – Commercial establishments are required by City Code to contract directly with a recycling vendor.

Solid Waste Reduction

In October 1994, the City made recycling mandatory for all residential and commercial customers. The City coordinates with Sarasota County to facilitate efficient and comprehensive waste management in an effort to reduce landfill demand pursuant to the Florida Waste Management Act and Sarasota County's reduction goals.

Hazardous Waste Disposal

The proper disposal of hazardous waste is important for the protection of natural resources as well as the health and safety of City residents. Sarasota County conducts an annual Amnesty Days program to encourage residents to safely store any potentially hazardous materials such as petroleum products, paint-related products, and pesticides, and to periodically take them to designated pick-up sites where they can be properly identified, transported, and disposed of. The City will cooperate with Sarasota County to continue to develop programs that address hazardous waste concerns.

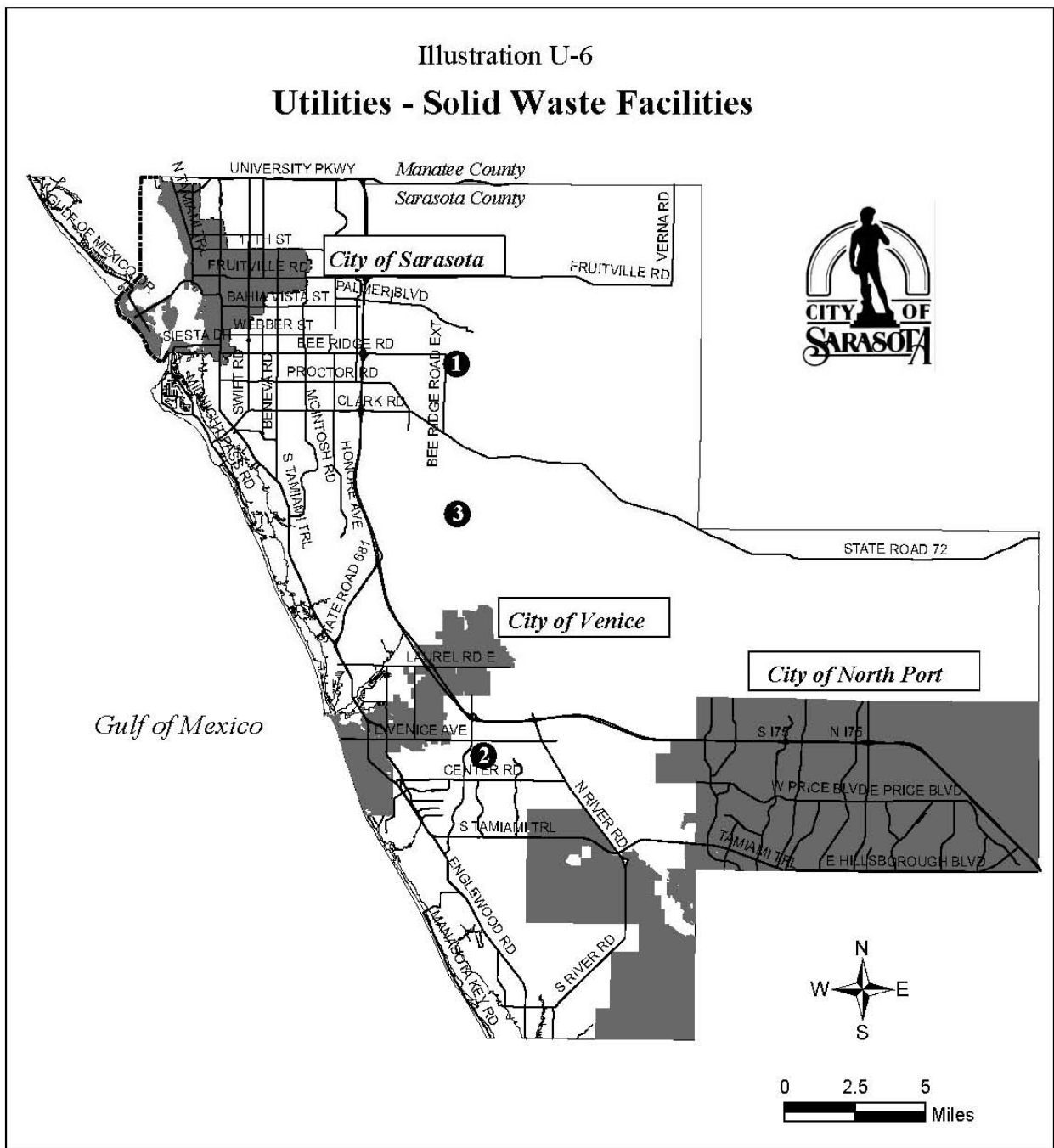
Impacts on Natural Resources

Landfill sites have the potential to adversely impact natural resources through the leaching of chemicals into groundwater supplies. Generally, landfill sites are regulated to prevent such problems through their design and detailed hydrology studies of the area. Groundwater monitoring and more stringent landfill regulations will help insure the integrity of future potable water supplies.

Emerging Issues

In June 1998, The Central County Solid Waste Disposal Complex was opened. This facility consists of approximately 550 acres of landfill area (labeled "3" on Illustration U-6). It is projected in Sarasota County's Comprehensive plan to serve the County's needs through 2038. An interlocal agreement between the City and the County provides that the City will deliver its municipal solid waste to this facility so long as tipping fees are pledged as security for indebtedness of the Sarasota County Series 1996 Solid Waste System Revenue Bonds (1996 Bonds) or any refunding of said bonds. However, in no case shall the term of the agreement extend beyond October 1, 2021.

Illustration U-6
Utilities - Solid Waste Facilities



Solid Waste Facilities

- 1. Bee Ridge Solid Waste Disposal Facility
- 2. Jackson Road Transfer Station
- 3. Central County Solid Waste Disposal Complex

Source: City of Sarasota Public Works Department, 1997

APPENDIX 1

Glossary

Advanced Wastewater Treatment (AWT)

Typically distinguished from other levels of treatment by the inclusion of biological/chemical nutrient removal.

Equivalent Residential Unit (ERU)

A residential billing unit such as a single-family residence, apartment unit, condominium unit. Or, commercial consumption equal to 6000 gallons of water or wastewater service used per month.

Level-of-Service (LOS)

An indicator of the extent or degree of service provided by, or proposed to be provided by a facility based on and related to the operational characteristics of the facility. Level of service shall indicate the capacity per unit of demand for each public facility.

Reverse Osmosis (R/O)

Desalination of water using semi-permeable membranes.