RESOLUTION NO. 2018-____

A RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS OF INDIAN RIVER COUNTY, FLORIDA, APPROVING THE TRANSMITTAL OF PROPOSED INDIAN RIVER COUNTY COMPREHENSIVE PLAN TEXT AMENDMENTS TO STATE AND REGIONAL REVIEW AGENCIES.

WHEREAS, the Board of County Commissioners adopted the Indian River County Comprehensive Plan on February 13, 1990, and

WHEREAS, the county received comprehensive plan amendment applications during its October 2017 amendment submittal window, and

WHEREAS, the Local Planning Agency, after due public notice, held a public hearing on these comprehensive plan amendment requests on February 8, 2018, and

WHEREAS, the Local Planning Agency, after receiving public comments, made a recommendation to the Board of County Commissioners; and

WHEREAS, the Board of County Commissioners held a Transmittal Public Hearing on March 20, 2018, after due public notice; and

WHEREAS, The Board of County Commissioners announced at the transmittal public hearing its intention to hold and advertise a final public hearing at the adoption stage of the plan amendment process.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF INDIAN RIVER COUNTY, FLORIDA THAT:

1. The above recitals are ratified in their entirety.

2. The following proposed amendments are approved for transmittal to State and Regional Review Agencies (Appendices A and B):

Attachment 7

RESOLUTION NO. 2018-____

AN ORDINANCE OF INDIAN RIVER COUNTY, FLORIDA, AMENDING THE TEXT OF THE SANITARY SEWER SUB-ELEMENT FOR SEPTIC TO SEWER CONVERSION AND THE ASSOCIATED TEXT OF THE FUTURE LAND USE ELEMENT OF THE COUNTY'S COMPREHENSIVE PLAN; AND PROVIDING CODIFICATION, SEVERABILITY, AND EFFECTIVE DATE; AND

AN ORDINANCE OF INDIAN RIVER COUNTY, FLORIDA, AMENDING THE TEXT OF THE COASTAL MANAGEMENT ELEMENT FOR SEA LEVEL RISE AND ASSOCIATED TEXT OF THE FUTURE LAND USE ELEMENT OF THE COUNTY'S COMPREHENSIVE PLAN; AND PROVIDING CODIFICATION, SEVERABILITY, AND EFFECTIVE DATE.

The forgoing Resolution was offered by Commissioner _____ and seconded by Commissioner _____ and upon being put to a vote, the vote was as follows:

Peter D. O'Bryan, Chairman	_____
Bob Solari, Vice Chairman	_____
Joseph E. Flescher, Commissioner	_____
Timothy Zorc, Commissioner	_____
Susan Adams, Commissioner	_____

The Chairman thereupon declared the resolution duly passed and adopted at a public hearing held this 20th day of March 2018.

BOARD OF COUNTY COMMISSIONERS
INDIAN RIVER COUNTY, FLORIDA

BY:_____
Peter D. O'Bryan, Chairman

ATTEST:_____
Jeffrey R. Smith, Clerk of Circuit Court and Comptroller

APPROVED AS TO FORM AND LEGAL SUFFICIENCY

_____
William K. DeBraal, Deputy County Attorney

APPROVED AS TO PLANNING MATTERS

_____
Stan Boling, AICP
Community Development Director

Indian River County
2030 Comprehensive Plan

Chapter 3A
Sanitary Sewer Sub-Element

Indian River County Community Development Department
Adopted: October 12, 2010

Supplement #____; Adopted _____, 2018, Ordinance 2018-_____

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INTRODUCTION

Wastewater is a term used to describe water leaving a site as sewage. Generally, this includes water from the kitchen and bathroom sinks, toilets, dishwashers, clothes washers, and bath tubs/showers. Each day, every person within Indian River County produces an average of 100 gallons of wastewater.

This wastewater has three possible destinations. First, it may enter an on-site sewage treatment and disposal system (OSTDS), usually a septic tank followed by a drainfield, where it receives a minimum level of treatment. Second, it may go to a private sewage treatment plant, generally located near the dwelling unit or other structure. Private treatment plants usually provide a greater degree of treatment than septic systems. The third possible destination for wastewater is a regional treatment plant. Such regional plants may be located many miles from the structure where wastewater is generated. These plants generally provide a consistently greater degree of treatment than either septic systems or private plants.

Wastewater treatment systems are comprised of three components; these are collection, treatment, and disposal. The importance of each of these three components varies with the type of wastewater system. This document will address the collection, treatment, and disposal characteristics of septic systems, private treatment plants, and regional treatment systems.

PURPOSE

The purpose of the Sanitary Sewer Sub-Element is to:

- identify existing and projected demand and need (demand - supply = need) for sanitary sewer facilities based on the county's population, existing and future land use, capacity of existing facilities and any future changes to these facilities;
- identify the operational responsibilities, geographic service areas and levels of service provided by each facility;
- identify those areas where public sewer will and will not be provided; and
- identify environmentally sound methods of disposing of treated wastes and sludge from treatment plants.

This sub-element will provide direction for the county in planning for the collection, treatment, and disposal of wastewater in a manner consistent with federal, state and local laws. In addition, the Sanitary Sewer Sub-Element will identify proposed locations and levels of service of sanitary sewer facilities. Finally, this element will establish sanitary sewer policies that complement the county's future land use pattern and serve as a means of directing future growth in the county.

DEFINITIONS

Wastewater means untreated sewage.

Effluent means the liquid by-product of the wastewater treatment process.

Wastewater Collection Network means the system of pipes which convey the untreated wastewater from individual homes and other establishments to the treatment plant.

Wastewater Interceptors are defined as parts of the collection system which connect directly to and convey sewage to the treatment plant.

Wastewater Trunk Mains are components of the collection system which connect directly to and convey sewage to the interceptors through a gravity system.

Pump Stations are mechanical devices used to pump sewage through the collection network (force mains) for the purpose of transporting the untreated wastewater to the treatment plant.

Force Main means a pressurized segment of the collection system.

Wastewater Treatment Plant means the facility which functions to remove solid and organic materials from the wastewater.

Wastewater Treatment Process is the means by which solid and organic materials are removed from the untreated wastewater.

Level of Wastewater Treatment is defined by the proportion of solid and organic materials removed from the wastewater. The most common levels of treatment are: primary, secondary, and tertiary.

Primary Treatment removes between 30 and 35 percent of the organic material and up to 50 percent of the solids from the sewage. Because screens and settling tanks are the most common methods used to remove the solids, this process is also referred to as physical treatment.

Secondary Treatment removes between 80 and 90 percent of the total organic material and suspended solids from the sewage. This level of treatment generally requires multiple steps involving one biological process and one or more physical processes for removal of suspended solids.

Tertiary Treatment is a level of wastewater treatment which removes the organic material and suspended solids, synthetic organic compounds and inorganic chemicals. If not removed, these agents may cause pollution problems. Tertiary treatment adds steps to the primary and secondary processes which will remove these pollutants. The most common tertiary processes

remove compounds of phosphorus and nitrogen. The effluent from advanced treatment processes often approaches the quality of drinking water.

Septic ~~Tank~~ Systems are small scale wastewater treatment systems consisting of two components. Those components are typically a septic tank where solids settle out and biological action occurs, and a drainfield where the remaining liquid is discharged and further treated. Septic ~~tank~~ systems provide a minimal level of wastewater treatment.

Regional Wastewater Treatment Systems are large scale sanitary sewer systems comprised of three components: collection of raw sewage; treatment of the sewage; and the disposal of the treated sludge and effluent.

Package Wastewater Treatment Plants are small treatment systems designed and built in modular units and having components similar to larger regional treatment facilities.

Infiltration means water, other than wastewater, that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections or manholes.

Inflow means water, other than wastewater, that enters a sewer system (including sewer service connections) from sources such as, but not limited to, roof leaders, cellar drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm waters, surface runoff, street wash waters or drainage.

BACKGROUND

An important aspect of wastewater or sanitary sewer planning involves examining existing conditions. Prior to that, however, it is helpful to consider the background or history of the wastewater system in the county. That provides a perspective regarding county policy on this matter. Instead of a static view of current conditions as the existing conditions section provides, the background section identifies recent trends in this area.

HISTORY

A review of recent history shows that Indian River County has owned and operated sanitary sewer facilities for only a relatively short time. Prior to the 1970's, the use of centralized facilities which provide the highest level of treatment and efficiency was limited to the densest and most intensely developed urban areas of the county. Those areas were located within or adjacent to the City of Vero Beach. While centralized sewer service has been available to the City of Vero Beach since 1926, the rest of the county did not have access to such service until the late 1970's.

In the past, the use of privately owned sewer facilities provided the county with an alternative to publicly owned, centralized sewer services. Private sewer facilities are operated by private companies which are given the authority to provide wastewater service to specified areas. Most private wastewater systems provide service only to an individual subdivision or development.

Prior to the establishment of the County Utilities Department in 1972, the regulation of wastewater facilities rested with several state and federal agencies and often focused on the permitting of new and the expansion of existing treatment facilities. By 1972, the regulatory agencies were becoming more intent on discouraging the use of individual septic tanks and small package systems.

COUNTY UTILITIES DEPARTMENT

Authorized to develop procedures and standards for utilities in the county, the County Utilities Department also issues utility permits. Initially formed to regulate privately owned utility systems, the Utilities Department was also charged with establishing a countywide utilities system. At the time that the utility department was created, centralized sewer services in the county were provided by the City of Vero Beach, by private utility companies, and by private systems serving individual buildings and developments. A majority of residential developments in the unincorporated county, however, relied on individual septic tanks for wastewater treatment and disposal.

In 1973, a master sewage plan was developed for the county. That plan identified the need for publicly owned and operated regional facilities to protect the public health and prosperity of the community. The plan outlined proposed service areas in the eastern portion of the county as well

as the necessary facilities and capitalization required to implement the plan. The plan also recommended eventually incorporating private sewer treatment facilities into the county system.

Also in 1973, the County and the City of Vero Beach entered into an agreement regarding the provision of sanitary sewer services. This agreement established boundaries for areas in the county that would receive services from the city.

CENTRALIZED REGIONAL SYSTEM

The county's first direct provision of wastewater treatment services took place in 1978, as the result of problems at two private sewer systems. The Gifford system (later to be known as the Central Plant) and Ixora Park facilities had experienced system failures that resulted in the release of raw sewage into the surrounding areas. Because of these problems and their environmental impacts, the County Utilities Department assumed responsibility for the operation of these plants. The Central Plant has since been expanded, while the Ixora plant has been decommissioned.

In 1982, county wastewater services expanded when the Utilities Department took over the operation of the Vista Royale and Vista Royale Gardens plants in the southern part of the county. This expansion continued with construction of the West Regional Wastewater Treatment Plant which began operation in 1986. Located south of SR 60 and east of I-95, the West Regional Plant provides wastewater service for the rapidly growing SR 60 Corridor area. In the early 1990's, the County took over the operation and the maintenance of the Blue Cypress Lake Package Wastewater Treatment Facility.

Utilities system expansion continued in the 1990's. In 1990, the county completed construction of the North County Plant. Then, the County acquired the South County Plant from General Development Utilities in 1993. In 1995, the county purchased the City of Sebastian's utilities system.

In 1987, Indian River County adopted a Wastewater Master Plan which has been updated several times since then, most recently in December 2004. That plan identified a system of wastewater treatment facilities to accommodate the anticipated growth of the county. The Master Plan identifies five sewer service areas. Those areas are North, West, Central, South, and City of Vero Beach.

One publicly owned and operated regional wastewater treatment plant exists within each of the five service areas. In addition to public facilities, septic ~~tanks~~ systems and private treatment facilities currently exist and will continue to exist in the county. Table 3.A.1 lists existing wastewater treatment plants in Indian River County with their capacity and service area.

Figure 3.A.1 Indian River County WWTF Service Areas

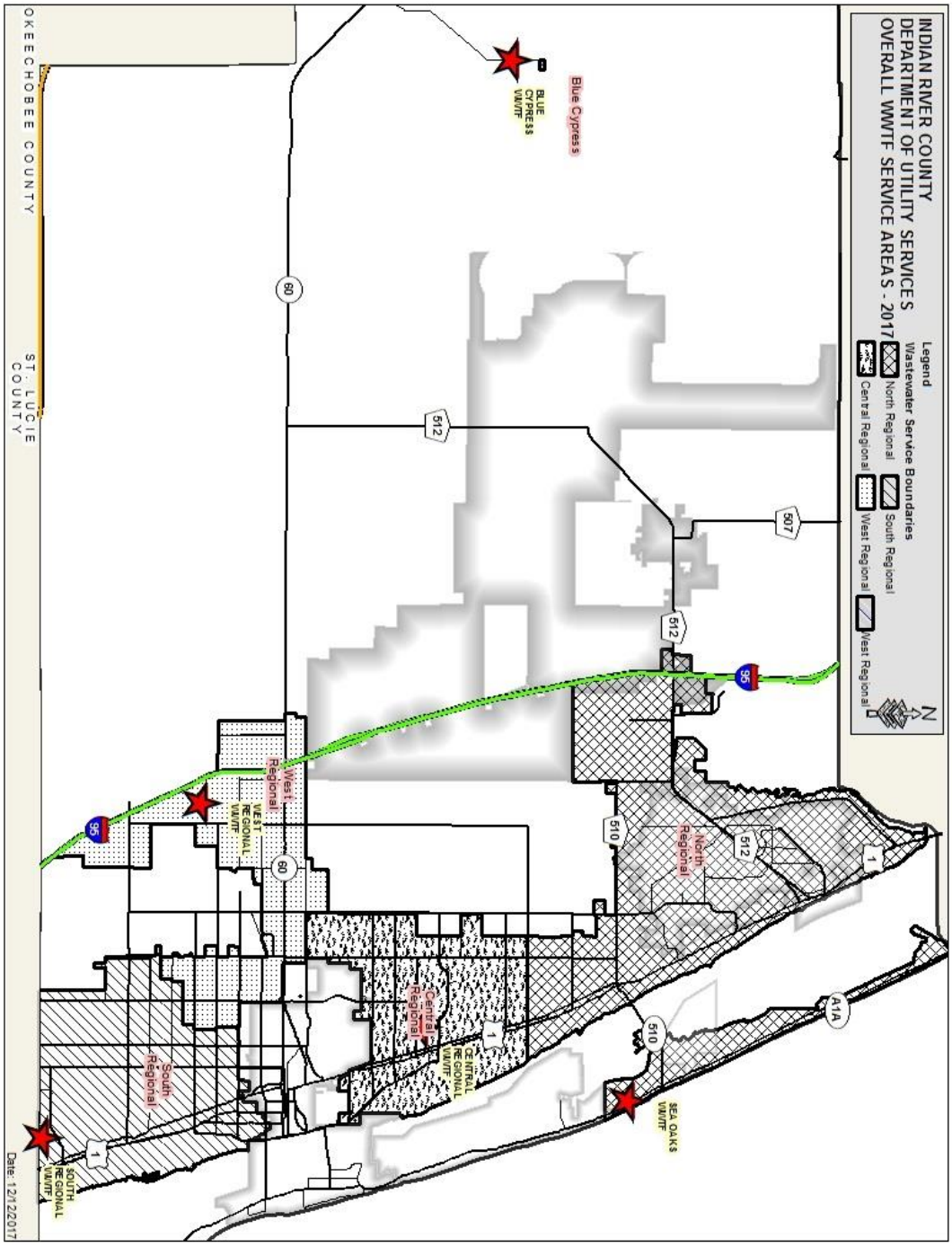


TABLE 3.A.1 - SANITARY SEWER FACILITIES IN INDIAN RIVER COUNTY*

FACILITY	PUBLIC OR PRIVATE	OPERATING ENTITY	PACKAGE OR REGIONAL	SERVICE AREA	DESIGN CAPACITY IN GALLONS/DAY
1. North County	public	IRC	regional	North of 77th Street to North County Line & North Barrier Island	850,000
2. Central County	public	IRC	regional	26th Street and Vero Beach City limits to 69th Street	4,000,000
3. West County	public	IRC	regional	South of 26th Street and west of City of Vero Beach	6,000,000
4. S. County	public	IRC	regional	Southeast mainland	2,000,000
5. Vero Beach	public	Vero Beach	regional	Vero Beach, Ind. Riv. Shores, S. Barrier Island	4,500,000
6. Blue Cypress	public	IRC	package	Blue Cypress Improvement Dist.	17,000~~20,000~~
7. Sun-Ag MHP	private	Sun-Ag Co.	package	Sun-Ag Mobile Home Park near Fellsmere	50,000
8. Sun-Ag Packing-house	private	Sun-Ag Co.	package	Sun-Ag Packinghouse near Fellsmere	2,500
9. Su-Rene Mobile Home Park	private	Su-Rene	package	Su-Rene Mobile Home Park	5,000
10. Royal Oak Mobile Home Park	private	Royal Oak	package	Royal Oak Mobile Home Park	5,000

* Excludes private permitted Industrial Waste Water facilities

SOURCE: Indian River County Utilities Department

EXISTING CONDITIONS

In assessing existing conditions, it is necessary to address the sanitary sewer system on several levels. First, it is necessary to differentiate among the various types of systems in the county. This involves separate consideration of the publicly-owned sewer systems, the privately-owned sewer systems, and individual septic systems. Second, it is necessary to identify individual service areas for both the public system and private systems. Finally, it is necessary to assess each type of system and service area in terms of collection, treatment, and disposal.

SANITARY SEWER PROCESS

Within the county, there are various sanitary sewer systems and service areas. Although specific aspects of the sanitary sewer process vary with the type of system, certain characteristics are the same, regardless of system type.

Collection

Once wastewater is generated by residences, businesses, industries, and other land uses, it is then conveyed from an individual establishment to a wastewater treatment plant by the collection network. Alternatively, the wastewater may go to an individual septic tank for on-site treatment. Where a centralized system is involved, however, the collection network is generally laid out in a pattern roughly comparable to the branching pattern of a tree. Whereas the smallest sewer pipes connect individual establishments to components of the collection system called trunk mains and interceptors, interceptors and trunk mains connect with and convey wastewater directly to the treatment plant.

Treatment

After being collected, wastewater is processed by a wastewater treatment plant. Presently, both Indian River County and the City of Vero Beach maintain regional wastewater treatment plants. In addition to those five regional facilities, there are four private package wastewater treatment facilities and the one public package treatment facility (the Blue Cypress Lake wastewater treatment plant) in the county. The existing wastewater treatment plants use a variety of methods to treat wastewater.

Once at the treatment plant, the wastewater is treated to remove solid and organic materials. The level of processing of the wastewater is either primary, secondary, advanced secondary, or tertiary. Overall, the treatment level is based on the treatment method and the proportion of materials removed from the wastewater.

In addition to differences in the methods of treating wastewater, the existing wastewater treatment plants also differ in the capacity of the facilities. Expressed in terms of gallons of wastewater per day, the capacity of a wastewater treatment plant is the number of gallons of wastewater that the plant can treat and dispose of on an average daily basis.

By-Product Disposal

The by-products of the treatment process are effluent, screenings and grit, as well as sludge and septage. Effluent is liquid waste. At county operated wastewater treatment facilities, effluent is usually disposed of through either discharge to a percolation pond, through wetlands, or by reuse. Reuse is an effluent disposal method involving spray irrigation.

Screenings and grit are the accumulated coarse sewage solids retained by the screening process. Screenings and grit are disposed of at the county landfill.

Sludge and septage are the biological organisms that accumulate in the plant. Prior to final disposal, sludge is usually subjected to an additional biological treatment process to remove pathogens. Sludge is then transported to the County's Residual Dewatering Facility (RDF), where along with grease they are subject ~~It is also subject~~ to a physical dewatering process~~es~~ which facilitates ~~transportation and~~ disposal. ~~Sludge and septage are disposed of at a special facility at the County landfill.~~ A screw conveyor is used to transfer the dried cake to a truck for hauling to the landfill for ultimate disposal.

PUBLIC SEWER SYSTEM

The five geographic areas comprising the county public sewer system are: the south regional area, the west regional area, the central regional area, the north regional area, and the City of Vero Beach service area. Within the county system, the south county regional plant is connected to the west county regional plant; the north county regional plant is connected to the central county regional plant; and there is a limited connection between the central regional plant and west regional plant. Because the county's regional wastewater treatment plants are interconnected, there is flexibility as to which plant or plants will need to be expanded to accommodate future demand.

At the county's central plant, the county also treats the City of Fellsmere's sewage for a bulk rate. Currently, the city's average daily sewer flow is about 71,000 gallons per day, with a maximum flow of 100,000 gallons per day.

Besides its regional plants, Indian River County also operates the Blue Cypress Lake package treatment facility.

In ~~2006~~ 2017, ~~21,349~~28,167 (47.24%~~44.30%~~) of the ~~unincorporated county's~~ 59,618~~48,188 residential units~~ developed residential and commercial parcels within the County's service area were connected to the County's regional sewer system. ~~At that time all customers of the county's system, including those living in municipalities, totaled 24,250.~~

South Regional Sewer Service Area

The South Regional Sewer Service Area is located in the southeast portion of the mainland and contains the South Regional Wastewater Treatment Facility (SRWWTF). The SRWWTF is a 2,000,000 GPD facility which uses biological nutrient removal to provide a tertiary filtration level of treatment. Effluent from the SRWWTF is reused ~~at various county sites~~for spray irrigation or discharged into percolation ponds or discharged into the 169 acre man-made wetland on the West Regional WWTF site.

In addition to force mains along US 1, the South Regional Service Area collection system currently extends to the Vero Shores, Garden Grove, and Grove Isle developments, portions of the Vero Beach Highlands residential subdivision, and other subdivisions within the southern portion of the county.

South Regional Plant	
Public or Private	Public
Operating Entity	Indian River County
Geographic service area	South County Area
Design capacity in GPD	2,000,000
Current demand in GPD (2017)	~~1,634,000~~ 813,000
Level of Service	250 GPD/ERU
Projected facility needs	1,850,000 gal./day 2030
Effluent Disposal Method	Reuse
Effluent Disposal Site	Various
Level of Treatment	Tertiary Filtration
Treatment Method	Biological Nutrient Removal
Screenings/Grit Disposal Site	Landfill
Sludge and Septage Disposal Site	Sludge Facility at Landfill

West Sewer Service Area

The West Regional Service Area includes the unincorporated SR 60 corridor area and the area southwest of Vero Beach. Within the West Regional Service Area, there is one wastewater treatment plant. The West Regional Wastewater Treatment Facility (WWTF) is located south of 8th Street, north of 4th Street, and between 90th Avenue and 82nd Avenue.

This plant, with a 6,000,000 GPD capacity, uses biological nutrient removal to provide a tertiary filtration level of treatment. Presently, effluent from this treatment facility is reused for spray irrigation or discharged into a ±1695 acre man-made wetland on the treatment plant site.

The West Regional Service Area force mains extend from the West Regional WWTF along the SR 60 corridor and along 66th Avenue from SR 60 to 4th Street. Force mains also extend from the West County Plant along 82nd Avenue to the Oslo Road/74th Avenue commercial/industrial node and to the SR 60/I-95 commercial/industrial node. The system serves the Heritage Village, Countryside, Cambridge Park, Indian River Estates, Village Green, Vista Plantation, Lake in the Woods, Sixty Oaks, and Rivera Estates residential developments.

West Regional Plant	
Public or Private	Public
Operating Entity	Indian River County
Geographic service area	SR 60 Corridor west of 58th Avenue
Design capacity in GPD	6,000,000
Current demand in GPD (2017)	~~1,950,000~~ 2,214,000
Level of Service	250 GPD/ERU
Projected facility needs	4,850,000 gal./day (2030)
Effluent Disposal Method	Reuse Irrigation/Wetlands Treatment
Effluent Disposal Site	Golf Courses & West Reg. Wetlands
Level of Treatment	Tertiary Filtration
Treatment Method	Biological Nutrient Removal
Screenings/Grit Disposal Site	Landfill
Sludge and Septage Disposal Site	Sludge Facility at Landfill

Central Sewer Service Area

The Central Regional Sewer Service Area includes the portion of the mainland generally bounded by I-95 on the west, 69th Street on the north, the Indian River Lagoon on the east, and the City of Vero Beach and 26th Street on the south. This plant located north of 49th Street, in the unincorporated community of Gifford. The Central Regional Wastewater Treatment Facility (WWTF) is located within the service area.

This plant, with a 4,000,000 GPD capacity, uses contact stabilization and extended aeration to provide a tertiary filtration level of treatment. Presently, effluent from the treatment facility is discharged into percolation ponds or reused for spray irrigation.

Collection lines extend from the plant along 49th Street, between 58rd Avenue and US 1, along 58th Avenue from 26th Street to 65th Street, along 53rd Street from 58th Avenue to the Lateral H canal and along US 1 from 69th street to Indian River Memorial Hospital. The system also extends to the Bent Pine and Grand Harbor residential developments, and to much of the Gifford community.

The Central Regional WWTF is presently accepting flow from the North Regional Wastewater Treatment Facility, which is temporarily on stand-by. The flow is being transferred from the north facility to the central facility via a 16" transmission force main located along Old Dixie Highway from 77th Street to 53rd Street, then into the Central Regional WWTF along the Lateral H canal.

Central Regional Plant	
Public or Private	Public
Operating Entity	Indian River County
Geographic service area	Vero Beach City Limits to 69th St.
Design capacity in GPD	4,000,000
Current demand in GPD (2017)	~~1,834,000~~ 2,253,000
Level of Service	250 GPD/ERU
Projected facility needs	4,250,000 gal./day (2030)
Effluent Disposal Method	Reuse Irrigation/Rib Basin
Effluent Disposal Site	Various Golf Courses
Level of Treatment	Tertiary Treatment
Treatment Method	Contact Stabilization/Extended Aeration
Screenings/Grit Disposal Site	Landfill
Sludge and Septage Disposal Site	Sludge Facility at landfill

North Sewer Service Area

The North Sewer Service Area lies north of 77th Street and encompasses the area between I-95 and the Atlantic Ocean. Within this service area, there is one wastewater treatment plant operated by the county. This plant is the North Regional Wastewater Treatment Facility (WWTF).

The North County Plant is an 850,000 GPD facility which uses an oxidation ditch and extended aeration to provide a tertiary filtration level of treatment. Effluent from the North County Plant is discharged into percolation ponds or reused for spray irrigation.

North Regional Plant	
Public or Private	Public
Operating Entity	Indian River County
Geographic service area	77th Street to North County Line
Design capacity in GPD	850,000
Current demand in GPD (2017)	Flow transferred to Central Regional Plant
Level of Service	250 GPD/ERU
Projected facility needs	~~4,850,000~~ 2,000,000 gal./day (2030)
Effluent Disposal Method	Percolation Pond/Spray Irrigation
Effluent Disposal Site	Golf Courses
Level of Treatment	Tertiary Filtration
Treatment Method	Oxidation Ditch/Extended Aeration
Screenings/Grit Disposal Site	Landfill
Sludge and Septage Disposal Site	Sludge Facility at landfill

Collection lines extend south from the North County Plant along Old Dixie Highway to 73rd Street. From there, the lines extend east into the Copeland's Landing residential development. To the north, lines extend along the US 1 corridor to the county line. A force main runs along CR 512, from US 1 to I-95, and north along Roseland Road from CR 512 to approximately ¼ mile north of Main Street. Another force main extends west along Main Street from US 1 to approximately halfway to Roseland Road. Collection lines, including a force main along the north two miles of Roseland Road, extend to the Roseland area. Collection lines also extend to several residential developments on the north barrier island, including Sea Oaks, Windsor, and the Town of Orchid.

Presently, the North Regional WWTF is temporarily shut down, and the flow is being transferred to the Central Regional WWTF via a 16' force main along Old Dixie Highway from 77th Street to 53rd Street and then along the Lateral H canal into the Central Regional WWTF.

City of Vero Beach Sewer Service Area

The City of Vero Beach sewer service territory encompasses the City of Vero Beach, most of the Town of Indian River Shores (one multiple-family residential complex is excluded), and the portion of the barrier island south of the City of Vero Beach. In addition, it serves some of the unincorporated county area around the city.

The Vero Beach Wastewater Treatment Plant has a design capacity of 4,500,000 GPD. The method of treatment consists of complete mix activated sludge, followed by water reclamation processes that include tertiary filtration and high level disinfection. Most effluent from this plant is used for irrigation by golf courses and residential developments. ~~During and immediately after periods of extremely high rainfall, however, some effluent is discharged into the Indian River Lagoon. Sludge disposal is by land application on agricultural properties for beneficial reuse.~~ The remainder is disposed of via deep injection well.

City of Vero Beach Plant	
Public or Private	Public
Operating Entity	City of Vero Beach
Geographic service area	City of Vero Beach; Town of Indian River Shores; South Barrier Island
Design capacity in GPD	4,500,000
Current demand in GPD (2017)	3,500,~~.~~000
Level of Service	250 GPD/ERU
Projected facility needs	4,000,000 gal./day (2030)
Effluent Disposal Method	Reuse/~~Wet Weather Discharge~~Deep Injection Well
Effluent Disposal Site	Residential Landscapes/Golf Courses
Level of Treatment	Secondary/High Level Disinfection
Treatment Method	Activated Sludge/Filtration
Screenings/Grit Disposal Site	Landfill
Sludge and Septage Disposal Site	~~Sludge facility at l~~Landfill

Table 3.A.2 summarizes the county regional wastewater treatment system.

TABLE 3.A.2 - COUNTY REGIONAL WASTEWATER TREATMENT SYSTEMS

SERVICE AREA	TREATMENT PLANT	DESIGN CAPACITY IN GPD	~~2009~~ 2017 DEMAND IN GPD	TYPES OF LAND USES SERVED	TREATMENT METHOD	TREATMENT LEVEL	EFFLUENT DISPOSAL METHOD	PROPORTIONAL ALLOCATION
NORTH	North County	850,000	Flow transferred to Central Plant	residential, commercial, industrial	oxidation ditch and extended aeration	tertiary	percolation pond and spray irrigation	60% Sebastian, 30% IRC, 10% Fellsmere
CENTRAL	Central County	4,000,000	~~1,834,000~~ 2,253,000 includes flow from north regional	residential, commercial, industrial	contact stabilization and extended aeration	tertiary	percolation pond and spray irrigation	100% IRC
WEST	West County	6,000,000	~~1,950,000~~ 2,214,000	residential, commercial, industrial	biological nutrient removal	tertiary	spray irrigation and on-site wetland	100% IRC
SOUTH	South County	2,000,000	~~1,634,000~~ 813,000	residential, commercial, industrial	Biological nutrient removal	tertiary	spray irrigation, percolation pond and West Regional Wetland	100% IRC
VERO BEACH	City of Vero Beach	4,500,000	3,500,000	residential, commercial, industrial	complete mix activated sludge and high level disinfection	tertiary	spray irrigation	65% Vero Bch., 24% IRC, 11% Indian River Shores
TOTAL		17,350,000	~~8,918,000~~ 8,780,000					

Finance

Financially, the Indian River County Utilities Department is an enterprise system. That means that there is no general tax money allocated for the construction or expansion of utility services. Instead, the County Utilities Department's revenue comes from sources such as water sales, meter installation charges, hydrant maintenance tax, sewer service charges, effluent reuse sales, penalties, service charges, capacity charges, and other sources which make the utility department financially self-sufficient.

According to c~~C~~ounty regulations, most parcels within 200 feet of a county sewer line must connect to the county system. Upon connection, a customer incurs certain charges. Those charges generally cover the costs of capacity producing facility capital improvements. Some charges, however, can be incurred even before connection. Because unused capacity can be reserved for future development, wastewater treatment plants are developed with excess capacity. Since maintaining that excess capacity increases operation and maintenance costs, a monthly base facility charge applies to capacity reserved for future development.

Other charges include the following:

- ~~W~~waste water treatment charges
- volume charges
- customer charges
- connection charges
- meter re-reads and leak inspection charges
- delinquency charges
- general service call charges
- meter calibration charges
- damage repair charges
- engineering services charges
- deposits required upon opening
- charges for transferring or reconnecting a service
- additional charges for complex connections

Some charges, such as connection fees, vary based on meter size or type of commercial use. The Utilities Department may use these revenues to expand facilities or to modify the existing system. These funds can be used for either capital or operating needs.

Another source of revenue, which can be used only to offset a portion of the capital cost of expanding system capacity, is the capacity charge. Capacity charges pay for certain necessary improvements that must be made in order to provide added capacity to meet the needs of new

residents as well as industrial and business establishments anticipated in future years. The remaining capital cost is recouped through monthly charges.

As a payment option for extension of the sewer collection system, the county allows a contribution in aid of construction. After the installation of sewage collection facilities by a developer, title to those facilities is transferred to the county. The referenced facilities may be "on-site" or "off-site." These options are discussed below.

- **On-Site Facilities**

Each developer is responsible for the design, installation, inspection, and testing of the complete sewage collection system located within the boundaries of the developer's property.

- **Off-site Facilities**

The location, size or proposed density or intensity of a development project may make service to the property dependent upon the extension of off-site sewage collection facilities. Off-site facilities are those mains, sewage collection lines, sewage force mains, and/or pumping stations adequate in size to transmit sewage collected on the developer's property to a treatment plant or disposal site.

The county's policy is to expand its sewer system in an orderly and economical manner. That expansion schedule, however, does not always coincide with a developer's plans. In cases where the county does not plan to expand its system to serve a project in the timeframe required by a developer, the developer is required to construct or pay the cost of off-site facilities associated with that project when the following conditions exist:

- such an extension would require an extraordinary expenditure by the county for transmission facilities; and
- such expenditure would cost more than the county's standard capacity charge.

In that event, the county may negotiate an agreement which enumerates the following:

- the county's responsibility to provide service to the development and possibly reimburse the developer for oversized facilities; and
- the developer's responsibility to construct and dedicate to the county the off-site facilities (possibly oversized to meet future demands).

Refundable Advances

In addition to a contribution in aid of construction of off-site facilities, the county may require a refundable advance by a developer to further temporarily defray the cost of any "off-site" extension of water and/or sewer mains and pumping stations necessary to connect the developer's property to the county's water and sewer facilities. This provision recognizes instances in which a developer may be required to advance funds to construct off-site facilities sized in accordance with the County's Master Plan. All amounts expended by a developer pursuant to such an agreement, over and above the developer's need for off-site facilities, may be refunded to the developer in accordance with the terms and conditions of a refunding agreement which the county executes with the developer. When the county deems it to be in the best interest of the county utility system, the County may assume a portion of the material cost of such projects. Generally, refund agreements provide for a plan of refund based upon the connection of other properties served by the "off-site" facilities installed by the developer.

Assessment

Another funding option available to the county is assessment. With this method, the Board of County Commissioners may assess benefitting property owners a proportional share of the cost of any county project, including utility line extensions. Assessment projects may be initiated by either the Board or property owners. For utility line extensions, main transmission or collection lines (Master Plan lines) are not included in the assessment calculations. Those lines are funded through other sources. Generally, assessments may be financed for up to 10 years, with assessment interest rates set by the Board of County Commissioners in January of each year. Usually, the Board adopts the prime rate.

PRIVATE SEWER SYSTEMS

Indian River County has four active private sewer systems, each of which uses package treatment plants. Two of the county's private plants are operated by the Sun-Ag company. Those plants are located near the City of Fellsmere, outside of the county's service area. One of those plants serves a mobile home park, while the other serves a packinghouse. Both of those facilities use extended aeration to provide a secondary level of treatment. Effluent at those plants is disposed of through a percolation pond.

The county's other private systems are located at the Su-Rene mobile home park and Royal Oak mobile home park in the unincorporated county. Those facilities use extended aeration to provide a secondary level of treatment. Effluent at those plants is disposed of through a percolation pond.

SEPTIC ~~TANKS~~SYSTEMS

The third type of sanitary sewer system is an onsite sewage and treatment and disposal system (OSTDS) which may be utilized under certain conditions when a private or publicly owned centralized sewer system is unavailable~~in the county is the individual system (OSTDS) or septic tank~~. ~~-~~Septic systems are ~~generally small and~~ designed to serve one or a limited number of ~~land uses~~facilities and are sized based on estimated water use.

Despite major expansion of the wastewater collection network, many ~~residents~~ developed commercial and residential parcels within the unincorporated portion of the county do not have access to regional wastewater treatment facilities or package treatment plants. For those land uses, wastewater treatment and disposal is provided by ~~individual~~ septic systems. Based on ~~According to the~~ the Florida Department of Health Waste Water Inventory for 2015,~~Indian River County Health Department (IRCHD)~~ an estimated 45% of the developed commercial and residential parcels in Indian River County are served by public sanitary sewer and an estimated 55% of the remaining developed commercial and residential parcels are served by septic systems. From 2007 through 2016, there were an average of ~~658~~ 121 new septic systems constructed annually with steadily increasing numbers from 2013 to 2016. Even so, the average number of new septic systems per year (121) is significantly lower than the 658 new systems per year average for the 1995 – 2006 period. The average number of septic systems repairs per year for the 2007-2016 period was 591.~~ within the unincorporated county between 1995 to 2006.~~ ~~Of those septic tanks, 5% to 8% were for commercial uses.~~ There are commercial and industrial corridors that are served by septic systems such as portions of US Hwy 1, Old Dixie Hwy and Oslo Road. Most of the residential septic systems are concentrated in Roseland, Sebastian, Vero Lake Estates, and ~~the older platted subdivisions~~ south of ~~the City of Vero Beach~~ State Road 60.

A septic ~~tank~~ system consists of two components. One is the septic tank, while the other is the drainfield. The tank receives sewage from the residence or commercial establishment and provides a period of settling, during which time a significant portion of the solids settle out. The treatment process is accomplished by bacteria that gradually decompose the solids which settle to the bottom of the septic tank. The remaining liquid or effluent is discharged through underground drainage pipes into the drainfield ~~and~~ where it percolates into the soil. Once in the soil, microorganisms and filtration ~~processes purify~~ treat the liquids. ~~Every three to five years,~~ As part of routine maintenance, the accumulated solids should ~~must~~ be removed from the septic tank every 3 to 5 years by a licensed contractor. ~~These~~ The solids, called septage, are generally transported to ~~regional sanitary sewer facilities for treatment prior to disposal.~~the residual dewatering facility next to the county landfill.

Septic ~~tank~~ systems provide minimal on-site wastewater treatment for ~~both~~ residential and ~~small-scale~~ commercial developments. ~~Generally,~~Typically, a 3-bedroom residential septic ~~tanks~~ system ~~range in capacity from 900 to 1000 gallons~~has a 900- gallon septic tank and 375 square

feet of trench drainfield. Commercial septic ~~tanks~~ systems vary depending on estimated water use.~~usually have a larger capacity.~~ Since effluent from septic tanks is discharged to a drainfield where it ~~is allowed to~~ percolates into the soil, soil permeability and depth to the water table are limiting factors for septic ~~tank~~ system use. To ensure adequate performance and protection of groundwater quality, elevation of septic ~~tank~~ system drainfields is often required. All OSTDS (septic system) permitting is done by the Florida Department of Health in Indian River County (DOH-Indian River).

According to the ~~IRCHD, Indian River County~~ DOH-Indian River it is challenging to ~~is a difficult~~ permit ~~county in which to install~~ septic ~~tank~~ systems installations in the county ~~. There are~~due to several factors ~~which account for this difficulty. These factors are~~including:

- ~~a high~~wet season water table of less than 10 inches as described in the USDA Soil Survey~~found in almost all areas of the county~~; ~~and~~
- ~~soil conditions consisting of an underlying hardpan strata in much of the county.~~ the presence of restrictive low permeable soil strata;
- platted or recorded parcels less than ½ acre; and
- setbacks from surface waters and/or wells.

~~While a high water table impedes the discharge of liquids into the drainfield, an underlying hardpan strata may prevent the filtration of effluent into the soil.~~

~~There are also other soil conditions that hinder the use of septic tank systems. Overall, though, most of the land area within the county is poorly drained and has severe septic tank system limitations. There are, however, two areas of the county in which the soils are better suited for the installation of septic tank systems. These areas are as follows:~~

- ~~Areas of South Florida Coastal Strand on the barrier island; and~~
- ~~Areas on the mainland in the vicinity of the Atlantic Coastal Ridge.~~

The areas of the county having "Excessively Drained Soils" and "Moderately Drained Soils" are better suited for septic ~~tank~~ systems. As shown on Figure 3.E.1 of the Stormwater Management Sub-Element, even these two soil types have limitations with respect to septic ~~tank~~ system suitability. While moderately drained soils have a severe limitation rating for septic ~~tank~~ system suitability, excessively drained soils percolate so rapidly that they provide very poor filtration. Septic ~~tanks~~ systems on these soils have a potential for causing groundwater contamination. Areas of excessively drained soils in Indian River County are typically adjacent to waterbodies including canals, St. Sebastian River, and the Indian River Lagoon.

~~Currently, the IRCHD~~ The Florida Department of Health (DOH) establishes the rules for septic system permitting.~~requires that a septic tank system have a minimum of 42 inches of well~~

~~draining soil below the infiltrating surface of the drainfield~~. During the wet season,~~months of~~ June through October, ~~the season of greatest rainfall,~~ the water table in much of the county ~~may be only~~ is less than ~~24~~ 10 inches below ~~this infiltrating surface~~ the existing natural grade. Therefore, fill material is often placed on top of existing soil creating a mound to achieve the required 24 inch separation between the bottom of the drainfield and the wet season water table. This fill material, which provides the depth necessary for the proper operation of the septic ~~tank~~ system, ~~is usually a highly porous sand that can purify the liquids discharged into the drainfield.~~typically contains slightly limited soils that treat effluent discharged into the drainfield.

The DOH has determined that the average life of a residential septic system (including drainfield) is 19 years and that of a commercial system is 10 years. Routine maintenance and proper use can extend the life of a septic system. When septic systems are repaired, the DOH allows for a drainfield replacement according to the rules in place at the time of original construction. Most repairs for parcels developed prior to 1983 are permitted with only a 6 inch separation between the bottom of the drainfield and the wet season water table rather than 24 inches.

In low density areas with adequate soils where septic ~~tanks~~ systems are appropriate, there can still be problems if septic ~~tanks~~ systems are not maintained. Generally, septic tanks need to be ~~pumped on a regular basis~~ pumped every 3 to 5 years. While there are private septic tank service companies which ~~empty~~ pump septic tanks and haul away septage, it is the septic tank owner who is responsible for initiating maintenance activities. Improperly maintained septic systems can cause a system failure and a sanitary nuisance often requiring a repair of the septic system.

~~Even when fill material is placed on a residential lot, there are still areas of the county in which there are problems with septic tank systems.~~ Besides soil and groundwater conditions, adverse impacts may arise ~~therse problems may be~~ due to inadequate separation between septic ~~tank~~ system drainfields and wells or waterbodies. Without adequate separation, the potential of contamination from septic ~~tanks~~ systems seeping into wells or waterbodies is greatly increased.

~~Presently, the IRCHD~~ The DOH requires a minimum separation of 75 feet between wells and septic ~~tanks~~ systems for parcels recorded or platted after 1972. ~~Generally, the~~The DOH ~~IRCHD~~ requires ~~that~~ new construction ~~lots~~ utilizing a well and septic ~~tank~~ system~~s~~ to be a minimum of ½ acre (approximately ~~20,000~~ 21,780 square feet). If a lot is served by a public water system, a septic ~~tank~~ system may be used even if the lot is as small as ¼ acre (approximately ~~10,000~~ 10,890 square feet).

There are many areas of the county in which existing subdivisions contain lots which do not meet the minimum acreage requirements. ~~for well and septic tank systems.~~ Nevertheless, parcels recorded or platted prior to 1972 that are smaller than 21,780 and 10,890 square feet are grandfathered in and are being developed and repaired based on lot flow allowances ~~residential~~

~~lots that do not meet those standards may be able to~~ utiliz~~ing~~ e septic ~~tank~~ systems~~.~~ ~~without increased health risks or increased probability of groundwater contamination if soil and groundwater conditions are favorable. That is particularly applicable to residential lots that are connected to the regional potable water system.~~ Table 3.A.3 lists subdivisions in the county urban service area that are significantly less than 10,~~.~~890 square feet or constructed with older block septic tanks posing an ~~with~~ increased health risk~~s~~ and/or increased probability of groundwater contamination associated with continued septic ~~tank~~ system use.

~~Like regional and private wastewater treatment facilities, septic systems also produce effluent and a solid by-product called septage. While septic tank effluent is discharged into a drainfield and percolates into the groundwater, the septage is deposited in the septic tank. Periodically, the septage must be removed from the tank. For residential septic systems, the interval between removal is typically three to five years. For land uses which generate large quantities of wastewater, the interval between removal times may be as frequent as once a month. The size of the septic tank, however, also influences how often removal occurs. When septage is removed from septic tanks, private contractors must haul the septage to the county's sludge and septage disposal facility at the county landfill.~~

TABLE 3.A.3 - INDIAN RIVER COUNTY SUBDIVISIONS WITH INCREASED HEALTH RISKS AND/OR INCREASED PROBABILITY OF GROUNDWATER CONTAMINATION ASSOCIATED WITH CONTINUED SEPTIC TANK SYSTEM USE

1. Oslo Park
2. Paradise Park
3. Stevens Park
4. Durrance Place
5. West Wabasso

Source: DOH - Indian River ~~County Health and Utilities Departments~~

Besides the above list of subdivisions with increased health risk and potential for localized groundwater contamination, there are subdivisions currently served by septic systems that are located close to the Indian River Lagoon, the St. Sebastian River, or to drainage canals or other streams/surface waters potentially resulting in a disproportionally higher negative impact on Indian River Lagoon water quality. In 2016, county Utilities Services funded a septic to sewer study to identify and rank those platted subdivisions served by septic systems that have a disproportionately higher negative impact on the Indian River Lagoon. The study was performed by Schulke, Bittle and Stoddard, LLC (SBS), was accepted by the Board of County Commissioners on July 10, 2017, and is available online via the county website.

Septic to Sewer Study: Evaluation and Ranking

The goal of the study was to identify and rank the areas of septic system use having disproportionately higher potential for negative lagoon impact based on various physical and environmental factors, and to determine the feasibility of incorporating septic to sewer conversion mitigation projects into a 10-year Capital Improvements Plan. As part of the study, a specific formula for the utility service area of Indian River County (IRC) was developed and modeled after similar studies performed for Martin County *(Martin County Septic System Evaluation Final Report; CapTec Engineering, Inc.; February 13, 2015)* and Brevard County *(Save Our Lagoon Project Plan for Brevard County, Florida; TetraTech, Inc and CloseWaters LLC; July 28, 2016).* The IRC formula was modified from the formulas used in the Martin and Brevard studies to consider and weigh physical and environmental factors that SBS and IRC staff determined would better represent Indian River County conditions. In the IRC study, the following factors were used in the initial ranking of the three hundred and twenty-five (325) platted subdivisions currently served by septic tanks with respect to potential negative impacts on the lagoon:

- Population Density for Loading Concentrations
- Proximity to Surface Waters
- Location of the Community in Relation to the 100-year Flood Plain – FEMA Flood Plain
- Depth of the Ground Water Table
- Soil Conditions of the Drain Field – Soil Type
- Age of the Surface Water Management System
- Age of the Existing Onsite Sewage Treatment and Disposal Systems (OSTDS)

Each factor was evaluated for every one of the 325 subdivisions and assigned an index number that generally ranged from 0 to 12, with 0 being the minimum and 12 being the maximum impact. The formula used to determine the ranking was simply the sum of all factor values for that subdivision. The higher the sum (the "score"), the higher the estimated potential negative impact to the Indian River Lagoon (IRL). SBS and IRC staff agreed to weight the "Population Density" and "Proximity to Surface Waters" factors in the IRC study, because those two factors are believed to cause a higher negative impact than the other factors.

In the study, the 325 subdivisions served by septic systems were ranked in order where number 1 had the highest negative lagoon impact (89.19) and number 325 had the lowest negative impact (26.97). Once the initial ranking was finalized, an Engineers Opinion of Probable Cost (OPC) was estimated for the top thirty five (35) ranked subdivisions having the highest negative impacts. Those top 35 ranked subdivisions were further evaluated based on the following factors:

1. Aquatic Health - Environmental Impact Evaluation or the Initial Ranking
2. Sewer System Evaluation and Cost Data
3. Total Nitrogen (TN)/Total Phosphorus (TP)
4. Public Health - Based on the availability of potable water

The study evaluated the total nitrogen (TN) and total phosphorus (TP) that could be removed from the environment by septic to sewer conversion and calculated a cost per pound for TN removal for each of the top 35 ranked subdivisions. TP calculations were removed from the analysis since most technical references and studies show that phosphorus is adequately removed by a properly functioning septic system. Septic to sewer conversion projects for the top 35 subdivisions were then ranked for the highest benefit to cost ratio, with the number 1 ranking providing the greatest benefit compared to the conversion project cost (see Table 3.A.3.1).

TABLE 3.A.3.1 - INDIAN RIVER COUNTY LIST OF SUBDIVISIONS FOR SEPTIC TO SEWER CONVERSION WITHIN UNINCORPORATED COUNTY~~, AND CITY OF SEBASTIAN, AND TOWN OF ORCHID~~

Rank	Subdivision Name	Rank	Subdivision Name	Rank	Subdivision Name
1	Floravon Shores Subdivision	14	Sebastian Highlands Unit 02 Replat PG 2	24	Dales Landing Subdivision Tropic Colony Subdivision
2	Sebastian Highlands Unit 02 Collier	14	Hobart Landing Unit 3	24	~~Amos (A of E)**~~
3	Sebastian Highlands Unit 05	16	River Shores Estates Units 1-4	29	Winter Grove Subdivision
4	Hobart Landing Unit 2	17	Pine Tree Park Units 1-4	29	Kanawah Acres
5	Orchid Island No. 2	17	Indian River Heights Units 1 -9	31	Tropic Colony Subdivision
5	Sebastian Highlands Unit 04	17	Sebastian Highlands Unit 02 Replat PG 3	32	Halleluiah Acres
7	Orchid Island No. 1	20	Rain Tree Corner Subdivision	33	Little Portion Subdivision Replat OF
8	Sebastian Highlands Unit 01	21	Diana Park Subdivision	34	*Sebastian Highlands Unit 02 Replat PG 4**
8	Ambersand Beach Sub No 1 & 2	22	Verona Estates Subdivision	35	*Heritage Trace at Hobart**
10	Sebastian Highlands Unit 03	22	Sebastian Highlands Unit 13; Little Portion Subdivision Replat Of		
11	Sebastian Highlands Unit 02	24	Hobart Landing Unit 1		
11	Naranja TR Shellmound Bch Replat of POR	24	Hallmark Ocean Subdivision		
13	Orchid Isle Estates Subdivision	24	Stevens Park Unit 1 & 2		

* These communities are included in the evaluation due to their proximity to one or more top 30 ranked communities.

** It is recommended that the Amos subdivision not be considered in the capital improvement program. Ranking results are due to an anomaly in the methodology.

REGULATORY FRAMEWORK

The wastewater collection, treatment, and disposal system is regulated by various agencies at all levels of government. Table 3.A.4 shows the state and local agencies involved in wastewater regulation and the types of activities in which they are involved.

FEDERAL

The Federal Water Pollution Control Act of 1972 (PL 92-500) and its amendments through the Clean Water Acts of 1977 (PL 95-217) and 1981 (PL 97-117) are the basis for pollution control regulation in the nation. The goal of these acts is the restoration and/or maintenance of the chemical, physical, and biological integrity of the nation's water. The act established a national policy of implementing areawide wastewater treatment and management programs to ensure adequate control of sources of pollution. Under a provision of PL 92-500, grants are made available to local governments to construct facilities to treat "point sources" of pollution, including effluent from sewage treatment processes. The U.S. Environmental Protection Agency is responsible for implementing the act.

STATE

The Florida Department of Environmental Protection (DEP) is the agency responsible for ensuring that the State carries out the requirements of PL 92-500. In response to PL 92-500, DEP has adopted Chapters 17-3 and 17-6, FAC. These chapters regulate wastewater facilities which treat flows exceeding 10,000 GPD.

~~Within the State, t~~The Florida Department of Health (DOH) regulates septic ~~tanks and drainfield~~ system installations per Section 381.0065 Florida ~~.~~Statutes (FS). ~~In each county, the~~The DOH~~-~~ Indian River locally administers the septic system program for Indian River County.~~has an office to regulate septic systems.~~ These regulations for septic system permitting are ~~have been adopted by rule~~ in Chapter 64E-6, Florida Administrative Code (FAC). While 64E-6 FAC does not set the criteria for septic ~~tank~~ system effluent quality, it does require that septic ~~tanks~~ systems be installed in such a manner that, with reasonable maintenance, they will not create a health hazard or endanger the safety of any domestic water supply.

In addition to regulating wastewater facilities, ~~64E-6~~Sections 381.0065(2)(a) and 381.00655 (FS) also establish~~es~~ criteria for mandatory connections to wastewater systems~~s. and potable water systems~~. ~~According to that regulation, land uses that are within 500 feet of a gravity line or 1000 sq. ft. of low pressure forcemain with accessibility to that line through public rights-of-way must connect to the utilities system.~~ Pursuant to those sections, p~~P~~ublic sanitary sewer is considered available when gravity sewer lines or low-pressure lines are in a right-of-way or easement adjacent to a property or lot, when any use producing more than 1,000 gallons per day has public sewer lines within 50 feet of a property line and has access to the lines via a public right-of-way or easement, when a public sewer line is accessible and within ¼ mile of a proposed residential subdivision of more than 50 lots, when a public sewer line is accessible and within ¼ mile of a

proposed commercial subdivision of more than 5 lots, or when a public sewer line is accessible and within ¼ mile of a proposed use in an area zoned or used for an industrial, manufacturing, or equivalent use. When repairs or modifications are needed to a use in an area zoned or used for industrial or manufacturing or its equivalent, that use must also connect to a wastewater system if that use is within 500 feet of an establishment's or residences sewer stub-out.

LOCAL

In 1984, Indian River County adopted an ordinance that established the utility rate structure and a mandatory hookup policy for both residential and non-residential development. County policy generally states that any development located within 200 feet of a wastewater collection line must connect. In addition to that ordinance, the Utilities Department also has developed and adopted design standards and review procedures to ensure that all connections to the system are compatible with the system's design.

TABLE 3.A.4 - REGULATION OF SEWAGE

Agency	Statutory Authority	Scope	Activity
DEP	Ch 403 FS 17-6 FAC	Responsible for all wastewater treatment plants, and wastewater flows greater than 10,000 GPD. Regulates private wastewater plants.	Permits & inspection of wastewater plants over 10,000 GPD. Regulates private package facilities.
DOH~~;~~ ~~County Health Department~~	Ch 381 FS 64E-6 FAC	Responsible for all onsite disposal systems less than 10,000 GPD of domestic wastewater.	Inspects, ~~tests~~permits, and enforces all septic systems less than 10,000 GPD. Responds to all public complaints.
County Utilities Dept.	Local Ordinance Home Rule	Responsible for review, ~~and~~ construction, and connection to ~~of~~ the public wastewater system. ~~Regulates franchise of private wastewater plants.~~	Inspects all work on county public wastewater system. ~~Regulates franchise package facilities. Will not permit package plants under 20,000 GPD capacity.~~

Source: Indian River County Utilities Department

ANALYSIS

The analysis of the Sanitary Sewer Sub-Element focuses on the three components of the sanitary sewer system: collection, treatment, and disposal.

COLLECTION SYSTEM

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

The county's long range 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 regional sanitary sewer service should generally be limited to lands within the urban service area, there should be some exceptions. Historically, the county has allowed sites contiguous to the urban service area boundary to connect to the regional sanitary sewer system, and that is appropriate.

There are also other types of development allowed outside the urban service area, where regional sanitary sewer 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 regional sanitary sewer 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 collection systems be built to county standards and, where deemed appropriate by the county, be dedicated to the county without compensation.

The major collection system issues include service area, system evaluation and maintenance, system expansion related to serving areas presently served by septic tank systems, and system expansion to serve new development.

Service Area

~~Although the sanitary sewer 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 county and the Town of Indian River Shores. For the unincorporated county, the city water and waste water agreement expired in 2017 and is currently being re-negotiated. For the Town of Indian River Shores, its agreement with the city for water, wastewater, and reuse expired and was renewed in 2012. That agreement is for an initial term of 15 years. Unless Indian River Shores provides notice of its desire to renegotiate or terminate four years before the expiration of that 15 year period, the agreement will automatically renew for another 15 years. ~~While those agreements expire in 2017, 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. Also, due to a surcharge of the rates used to offset the city's general fund, customers became disenchanted with the management of the City of Vero Beach utility system. 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.~~

Currently, the Indian River County water and waste water service area is comprised of the following:

- Majority of unincorporated Indian River County
- City of Sebastian
- Town of Orchid

System Evaluation and Maintenance

The sanitary sewer collection system is evaluated with each application for new development, and as each package treatment plant is decommissioned. That evaluation is done using a computer modeling program, known as the "WaterCad" model that evaluates several factors, including pipe capacity, lift station capacity, horse power requirements for pumps, and hydraulic pump pressure. In contrast to the City of Vero Beach, which is largely built-out and has provided utility service for many decades, sewer service is still relatively new to the rapidly

growing unincorporated county. Consequently, the county's collection system is constantly evaluated.

Within the county's service area, the major collection system problem is low velocity in force mains. In particular, the 24 inch, 20 inch, and 12 inch force mains in the US 1 corridor have low velocities even at peak flows. The low velocity is caused by oversized lines and a lack of wastewater generated. Where the velocity is less than 2 feet/second, solids will settle in pipelines. Settled solids decrease hydraulic capacity.

Another problem occurs when a mass of accumulated solids become "unsettled" and reaches a treatment plant in an unexpectedly large concentration. In the past, this situation has resulted in sewage spills. While increased pipeline maintenance is necessary to prevent a reoccurrence of such spills, the recent installation of numerous automatic air release valves has corrected the problem by relieving gases that were preventing the normal flow of sewage through influent pipes. In the future, the county's policy should be to continue to install automatic air release valves in all new lines.

Service to New Development

Through the Utilities Department Wastewater Master Plan, the county has identified main lines that must be installed along major corridors. Unlike other collection lines, "Master Plan" lines usually do not connect directly to a wastewater generator. While master plan lines are paid for by the Utilities Department with revenue from capacity charges and other sources, non-master plan lines are paid from other sources.

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

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

For non-residential projects, only those located more than ¼ mile from the existing system and generating less than 2000 gallons per day are not required to connect to the regional system. Even non-residential projects meeting those requirements must connect if the system expands to within ¼ mile of the project.

Those requirements need to be maintained to ensure that expansion of the regional sanitary sewer system occurs and to ensure that the costs of that 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 sanitary sewer system if the project is deemed unacceptable for septic tank system use due to increased health and groundwater contamination risks.

There are several reasons for requiring nearly all new development to connect to the regional system. Those reasons are listed below.

- Regional systems are less likely to fail.
- Regional systems are better regulated and inspected.
- Regional systems provide a higher level of treatment. That higher level of treatment allows the effluent to be reused, rather than injected into the ground where the effluent increases the risk of groundwater contamination.
- Regional systems are economically more efficient to build and operate, but only if all new development connects to the system.

Septic ~~Tanks~~Systems

Between ~~1995~~ 2007 and 20~~0~~16, ~~7,239~~ 1,217 new septic ~~tanks~~systems (average of ~~658~~121 per year) were permitted. Additionally, during that time period 5,919 septic systems were repaired typically requiring a drainfield replacement. ~~within the county.~~

Generally, septic ~~tanks~~ systems are a potential source of groundwater and surface water contamination, especially in areas where they are densely concentrated, ~~and~~ the water table is high and waterbody setbacks are less than 75 feet. According to the ~~IRCHD~~DOH-Indian River, there have been ~~are many~~ cases of ~~on record of a well's water source~~ wells and surface waters being contaminated~~becoming polluted due to septic tank discharges~~ from septic system discharges. As indicated in Table 3.A.5, septic ~~tank~~ system effluent is of poor quality by today's wastewater treatment standards. Consequently, effluent discharges can cause detrimental increases in nitrogen, chloride, sodium, other ions, total dissolved solids, and the microbiological levels of the local groundwater.

TABLE 3.A.5 - TYPICAL CONCENTRATIONS FOR HOUSEHOLD WASTEWATER, SEPTIC TANK EFFLUENT AND WASTEWATER TREATMENT PLANT EFFLUENT

PARAMETER	CONCENTRATION		
	HOUSEHOLD WASTEWATER	SEPTIC TANK EFFLUENT	WASTEWATER TREATMENT PLANT (Max Day)
Biochemical Oxygen Demand, 5-day (BOD_5), mg/1	430	150	20
Total Suspended Solids, mg/1	370	50	20
Fecal Coliform (per 100ml)	7.5 $X10^5$	$5X10^5$	200
Total Nitrogen, mg/1	84	30	~~30~~12
Ammonia Nitrogen, mg/1	64	25	N/A
Total Phosph~~ate~~orus, mg/1	61	12	~~6~~1.5

Source: Indian River County Wastewater Master Plan

Generally, the current system of septic ~~tank~~ system maintenance is acceptable, particularly for newer septic tanks meeting current regulations. For older septic ~~tanks~~systems, however, lack of maintenance can be a problem, and there is no program requiring regular maintenance of these septic ~~tanks~~systems. According to ~~the County Health Department~~DOH-Indian River, a required septic tank maintenance program could reduce septic ~~tank~~ system failures and associated adverse impacts; however, such a program would be costly and difficult to implement. In the future, the focus of the county and the ~~IRCHD~~ DOH-Indian River should be on providing public education programs on the proper use, inspection, and maintenance of septic tanks.

Several features inherent to the operation of septic ~~tank~~ systems make them prone to contaminating groundwater without any visual indication. For example, septic ~~tanks~~ systems that are undersized or not ~~emptied often enough~~pumped every 3-5 years can accumulate sludge and scum, resulting in a poorer quality effluent. ~~If~~ When high groundwater conditions (within ~~3 to 4 feet of drainfield elevation~~2 feet from the bottom of the drainfield) exist, additional fill is needed. Once a septic ~~tank~~ system is installed and buried, these and other operating problems cannot be recognized until the entire system fails and raw (untreated) sewage backs up into the house plumbing or seeps above ground. Thus, a septic ~~tank~~ system that appears to be functioning properly may, in reality, be providing very poor "treatment". This problem is more likely to occur in areas of higher residential density where parcels are less than ¼ acre, ~~and~~ in

areas with a high concentration of commercial/industrial use, and areas with construction that predates 1983.

According to the United States Department of Agriculture's Soil Conservation Service, Soil Survey most of Indian River County's soil has severe limitations for the use of septic tank systems. Combined with the county's high wet season water table, this creates a high potential for groundwater and surface water contamination problems.

Since 1983, for new construction, the DOH has required that the bottom of drainfields be at least 24 inches above the wet season water table. To meet this requirement, typically slightly limited soil may be added to the site creating a mound. Also, a minimum 75 foot separation requirement must be met between wells and/or waterbodies and septic tank systems. When parcels platted or recorded after 1972 meet minimum lot size requirements and the above conditions, septic tank system performance is considered adequate for developments within the county.

Another issue with septic tank systems is the possibility of septage effluent from a septic tank system entering waterbodies in the county. This problem must be examined carefully, especially on the barrier island, in areas near the Indian River Lagoon, in areas near the St. Sebastian River, and in areas adjacent to canals, lakes or wetlands.

To summarize, the problems with septic tank systems are listed below:

- Physical limitations existing in Indian River County
    - A high water table of less than 10 inches as described in the USDA Soil Survey is found in almost all areas of the county, especially during the wet season June through October.
    - Ninety-three percent of the county's soil is considered to have restrictive low permeable soil strata not suitable for septic system installations.

- Health and safety
    - Poor quality of septic ~~tank~~ system effluent compared to wastewater treatment plant effluent.
    - ~~High risk~~ Potential for~~of~~ groundwater contamination and spread of communicable disease.
    - Cost and insufficiency of monitoring process.
    - Inappropriate septage disposal.

- Environmental Consideration
    - Groundwater contamination.
    - ~~Leachate to surface water bodies.~~Waterbody contamination.

For those reasons, there is a need to expand the regional wastewater treatment system to areas where existing or future land uses, soil and groundwater conditions, proximity to surface water bodies, and/or lot size make continued use of septic systems unacceptable due to increased health and groundwater contamination risks.

~~With this in mind, t~~The county should ~~always~~ allow the voluntary expansion of the regional sanitary sewer system to existing developments within the urban service area. Additionally, the county must determine under what conditions to impose retrofitting on existing development especially areas that impact the Indian River Lagoon and areas significantly less than ¼ acre in size. Some parcels recorded ~~and~~or platted prior to 1972 are only 0.11 acres making it difficult to repair septic systems to code. ~~—~~As indicated in the finance section of this element, a major portion of the cost of service expansion to existing subdivisions is funded through assessments. In the past, some residents have objected to the costs of such assessments, often citing an inability to pay.

~~Throughout the county, many older residential subdivisions contain lots smaller than the IRCHD's current ½ acre minimum. Because these subdivisions generally contain households in the lower portion of the county's income range, retrofitting those subdivisions with centralized sewer service would cost those households a greater portion of their income than would be associated with the average county household.~~

~~Under certain conditions, the increased health and groundwater contamination risks associated with septic tank systems may be insignificant. This is often the case in residential developments that are connected to a regional potable water system. If conditions are favorable and the units are connected to a regional potable water system, even residential developments with lots smaller than 1/2 acre may be served by septic tank systems without significantly increasing health and groundwater contamination risks. Therefore, expanding the system to include all existing residential subdivisions with lots smaller than 1/2 acre is not needed.~~

~~Instead, t~~The county must establish criteria to differentiate between areas where retrofitting is required. ~~and areas where retrofitting is allowed.~~ Because of the cost of retrofitting projects within the urban service area ~~is relatively constant,~~ the most appropriate criteria to use to identify areas to retrofit are increased health risks and increased groundwater and/or surface water contamination risks. When any of the following conditions exist and the ~~IRCHD~~DOH-Indian River verifies that the health and groundwater contamination risks cannot be sufficiently reduced by any means other than connecting to the regional system, retrofitting must occur.

- ~~•~~ Areas with small lot sizes less than ¼ acre especially those constructed prior to 1983. ~~Where units are not connected to a regional potable water system, this refers to lots of ½ acre or less.~~ Residential subdivisions that meet those criteria are identified in Table 3.A.3.

- Areas with intense land uses. Intense land uses means commercial,~~/~~ industrial or equivalent uses or residential uses greater than 6 units/acre.

- Environmentally Sensitive Areas. This means areas within 500 feet of aquifer recharge zones, as identified in the Aquifer Recharge Sub-Element of this plan; within 500 feet of any public water supply well; within 500 feet of the Indian River Lagoon, the St. Sebastian River, or any body of water that drains into them.

- As identified in the 2017 Septic to Sewer Study: Evaluation and Ranking by Utilities.

- Areas identified by the DOH-Indian River ~~IRCHD~~ as potential threats to public health ~~or a history of septic tank failures~~.

- New developments on oceanfront and riverfront lots

For planning purposes, a history of septic ~~tank failure~~system repairs is defined as follows:

For subdivisions of 10 or fewer lots, this means 20% failures in five years. For subdivisions of 11 to 75 lots, this means 10% failures in ~~eight~~ five years. For subdivisions of more than 75 lots, this means 2% failures in ~~ten~~ five years. ~~Residential subdivisions that meet those criteria are identified in Table 3.A.3.~~

Methods that allow for a higher level of effluent treatment and reduction of contamination include: ~~I~~installation of a "performance based system", providing a 24 inch separation between the bottom of the drainfield and the wet season water table, and providing at least a 75 foot setback between septic systems and wells and/or surface waterbodies. Generally, the most effective and efficient way to correct the wastewater problem of those subdivisions is to connect them to the regional system~~. Other options could involve adding fill and/or pumping the wastewater to another septic tank. Although the costs and effectiveness of these options vary~~

~~due to specific circumstances, they seldom justify not connecting to the regional system. In the future, the county should continue to offer its assessment program that provides sanitary sewer to the neighborhoods where individuals benefiting from the connection to the sanitary sewer system pay for the cost of service expansion.~~

TREATMENT

In addition to septic ~~tank~~ systems, public and private treatment plants provide wastewater treatment within the county. In Indian River County, large regional public treatment plants now predominate. Consequently, major treatment issues in the county relate primarily to ensuring sufficient capacity (either on-site or off-site) to accommodate projected growth.

If wastewater demand were allowed to exceed the county's treatment capacity, untreated sewage would have to be discharged. That would result in health hazards and environmental degradation of surface water bodies. To prevent such an occurrence, the county must continue its policy of approving new development only when sufficient capacity will be available. In this regard, the county's computerized concurrency management system and its capital improvements plan ensure that capacity will be available to serve new development concurrent with demand.

Public Treatment Plants

Besides producing high quality effluent, all public treatment plants currently have more than enough capacity to accommodate existing demand. The following sections discuss the county's future wastewater treatment needs and alternatives to meet those needs.

Projection of Future Demand

Assumptions

The comprehensive planning process is an opportunity for the county to complete an assessment of its long range sanitary sewer needs. Such a needs assessment must consist of an analysis that is more than a straight line linear projection. Future projections should utilize certain assumptions based on past trends, present conditions, and future desires. The main assumptions utilized in the sanitary sewer needs assessment are as follows:

- The county will be the primary provider of sanitary sewer collection, treatment, and disposal;

- 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

- 90% to 95% of future new development will connect to the regional sewer system.

The county will continue to maintain these policies and evaluate the feasibility of regional system versus package treatment plants for the above referenced type of developments.

The existing conditions section of this sub-element provides a discussion of the existing capacity of centralized wastewater treatment facilities, with an emphasis on the county system. That discussion addresses the supply side of the wastewater treatment system. This section considers the demand side.

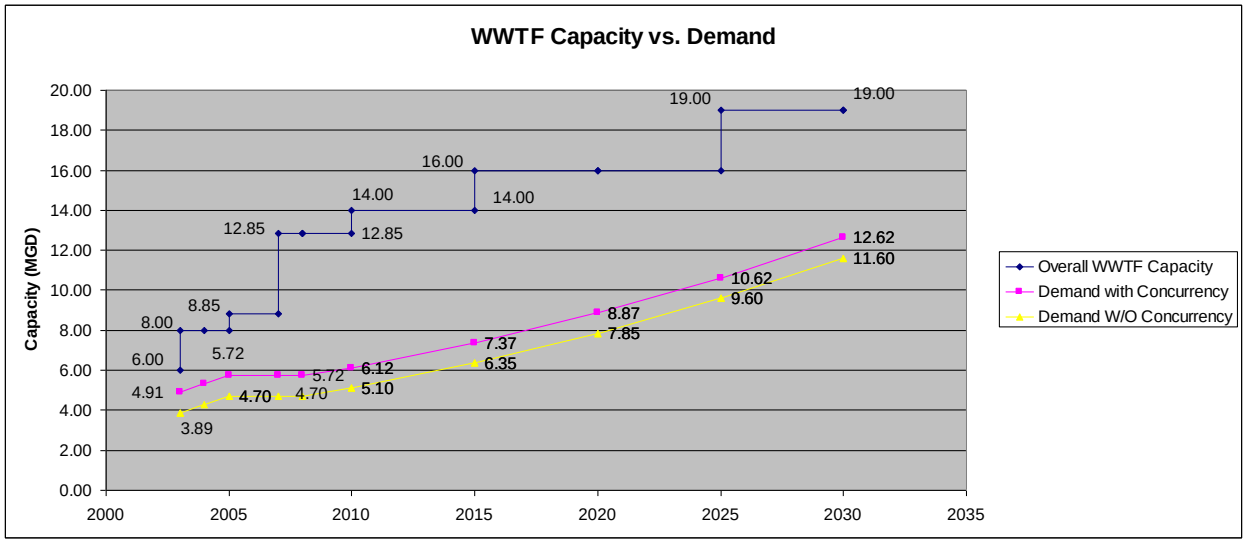
The information for this section is based on the permanent and functional population projections contained in the Introductory Element and on the projected land use patterns contained in the Future Land Use Element. That information is also consistent with the county utilities master plan. To develop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

As with other facility analyses, planning for wastewater treatment facility expansion 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 wastewater generation rates for future treatment facility expansions.

Capital Improvements

According to the county sanitary sewer master plan, the total design capacity of the county sanitary sewer system in 2030 is projected to be 19 million gallons per day (MGD), while total demand is projected to be about 12.62 million gallons per day (MGD). ~~To get to a 19 gallon per day capacity, either the north county regional plant and/or the west regional plant will be expanded in each of the following years: 2010, 2015, and 2025. The increases will be: 2 mgd in 2010; 2 mgd in 2015; and 3 mgd in 2025.~~ This information is shown in the graph below. Because all of the plants in the county system are interconnected, there is flexibility as to which plant or plants will be expanded to accommodate future demand.

Figure 3.A.2 WWTF Capacity vs. Demand



To ensure sufficient capacity through 2030, 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 (DEP) 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.

A list of sanitary sewer capital improvements is provided in the Capital Improvements Element (CIE) of the county's comprehensive plan ~~and provided in Appendix "A" of this sub-element~~. Since the county's CIE must be updated annually, projects completed will be dropped from the list of capital improvements and new projects will be added as needed.

Within the county, a number of existing residential developments are not connected to the county sanitary sewer system. If all unserved developments were connected to the regional sanitary sewer system, there would be significant additional wastewater treatment demand. For a number of reasons, however, most unserved developments will never connect to the regional system.

In many cases, septic systems are adequate to accommodate individual single family houses, and there is no need to retrofit existing subdivisions with sanitary sewer lines. Where subdivisions are served by a centralized potable water system, there are seldom problems caused by lots having individual septic ~~tanks~~systems. Given the high cost of retrofitting existing subdivisions with sanitary sewer lines and given the limited benefits of connecting, it is unlikely that many existing subdivisions will be retrofitted with sewers in the future.

There are, however, some circumstances where connecting existing subdivisions to the sanitary sewer system would be beneficial. Those circumstances mostly relate to a subdivision's proximity to a waterbody. Because septic ~~tanks~~systems can leach pollutants and those pollutants can impact the ocean, the Indian River Lagoon, the St. Sebastian River, or other surface water bodies, the county has an interest in promoting the connection of waterfront subdivisions to the sanitary sewer system.

In the future, the county should continue to offer its assessment program that provides sanitary sewer to those neighborhoods where individuals benefiting from the connection to the sanitary sewer system pay for the cost of service expansion.

Wastewater Needs 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 the urban service area.

Since adoption of the 1990 comprehensive plan, the regional wastewater collection system has been extended 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 sanitary sewer system service area has been greatly expanded, there are still several areas such as Oslo Park, Vero Lake Estates, Paradise Park and other areas which are not yet served. In the future, the county should evaluate whether or not unserved areas should be connected to the regional sanitary sewer system.

Private Treatment Plants

As indicated in the background section of this Sub-Element, the reason that the c~~C~~ounty started direct provision of wastewater treatment services was due to problems at private package treatment facilities. In many cases, the problems with private plants were due to the operational aspects of the plant, rather than with the plant itself. Because of those problems and their environmental impacts, the County Utilities Department has decommissioned all but four private plants. Customers formerly served by private plants that have been decommissioned have been connected to the county system.

To avoid a repeat of past problems, to ensure the financial viability of the regional system, and to discourage urban sprawl, new package treatment plants are generally prohibited within the urban service area. Consistent with the provisions of the Future Land Use Element of this plan, package treatment plants or connection to the regional system may be allowed outside of the urban service area to serve development projects that meet the following specific criteria:

- 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.
- agricultural businesses and industries (including biofuel facilities)

In the future, the county will continue to maintain and enforce the above referenced policies.

EFFLUENT DISPOSAL

Another wastewater treatment issue concerns long range plans for effluent disposal. With respect to effluent disposal, the county has several alternatives. Those alternatives include requiring new commercial and/or residential development to use reuse water, retrofitting existing development to use reuse water, or creating wetlands with reuse water.

While retrofitting existing development is, by a large margin, the most expensive of these options, requiring that new development accommodate reuse water is somewhat less expensive. In fact, new commercial areas are currently required to accommodate reuse lines. Even some single-family and multiple-family residential developers, although not required to, have chosen to incur the extra expense of building their projects to accommodate reuse water.

Currently, reuse through spray irrigation is the county's primary effluent disposal method. This method is consistent with the county's emphasis to conserve potable water. For that reason, the ~~c~~County ~~u~~Utilities ~~d~~Department is planning to modify the county's sanitary sewer system

connection regulations to require that all new subdivisions of 25 or more lots within one-quarter of a mile of an existing re-use line connect to the re-use line for irrigation purposes.

Perhaps the most successful and efficient effluent reuse method currently used by the county is at the West County Plant. At that site, a ±165 acre man-made wetland has been created and maintained with effluent from the plant. Besides the creation of habitat for many species of plants and animals, the benefits of that method of effluent disposal include greatly decreased operating costs.

Although the wetland at the West County Plant is adjacent to the plant, such man-made wetlands are not required to be located near a treatment plant. If not located near a plant, however, they must be located near a reuse water transmission line.

Because the long term benefit of developing such wetlands may outweigh the initial land acquisition and construction costs, the county should begin studying the feasibility of developing additional wetlands.

SUMMARY OF ANALYSIS

Currently, the county's sanitary sewer system is meeting the needs of the community. There is, however, a need to expand the regional wastewater treatment system. That expansion is needed to meet the demand of projected population growth through 2030, and is currently planned to occur with incremental plant expansions.

While the county's wastewater system works well, septic ~~tanks~~systems are still an issue. In the future, the county needs to ensure that even fewer new units use septic ~~tanks~~systems, while also connecting existing septic ~~tank~~systems users to the regional system where problems exist. To address the thousands of existing septic ~~tanks~~systems, the county and Health Department need to evaluate the feasibility of establishing a mandatory septic ~~tank~~system maintenance system.

Although the county has successfully extended sewer lines within the urban service area, the county needs to continue to expand its collection system to serve the entire urban service area. Along with that, the county needs to expand its reuse system.

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GOAL, OBJECTIVES AND POLICIES

GOAL

Indian River County shall have an efficient system of sanitary sewer disposal 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 sanitary sewer 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 capacity is available, either on-site or off-site, to provide needed sanitary sewer service.

POLICY 1.2: The ~~county utilities department~~ DEP, on an annual basis, shall inspect all private wastewater treatment plants in Indian River County.

POLICY 1.3: The county hereby adopts a sanitary sewer level of service standard of 250 gallons per day per equivalent residential unit with a peak monthly flow factor of 1.25. That standard shall be utilized for determining the availability of facility capacity and the demand generated by a development.

POLICY 1.4: Through its computerized permit tracking 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 Planning Division, on an as needed basis, shall provide summary reports containing capacity and demand information for each public wastewater treatment plant within the county service area.

POLICY 1.6: Consistent with the county's water and wastewater connection matrix, the county shall continue to allow the use of septic tank systems in rural areas for single-family units and for domestic waste disposal by small retail establishments. The use of septic ~~tank~~ systems must be approved by the Health Department and be consistent with Rule 64E-6, FAC.

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OBJECTIVE 2 Regional System Expansion/Correction of Deficiencies

By 2025 ~~2015~~, at least 6050% of all existing ~~residential~~ units in the county's service area will be connected to the county's ~~a~~ regional sanitary sewer system. This will be an increase from 52.7% ~~44%~~ in 2017~~2006.~~

POLICY 2.1: The county shall continue to offer the utility assessment program to areas with septic ~~service~~ systems 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: The county shall give~~n~~ priority for the provision of public sanitary sewer services to the subdivisions on the list of subdivisions as identified in Table 3.A.3 designated as requiring sanitary sewer service due to public health threats by DOH.

POLICY 2.4: The county shall provide public sanitary sewer service to areas where the lack of such service is determined to be a public health threat and shall initiate sewer projects where feasible to serve subdivisions served by septic systems and identified in Table 3.A.3.1 as posing a disproportionately high potential negative impact on Indian River Lagoon water quality. The county shall recover costs through those connecting to the system and directly benefitting from the improvement.

POLICY 2.5: Consistent with its interlocal agreements with the City of Sebastian and the Town of Orchid, the county shall provide sanitary sewer services to those municipalities.

~~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~~.

POLICY 2.6: By 2018, the county shall perform a financial analysis for septic to sewer conversion projects. Based on that analysis and available funding a specific list of subdivisions to be connected to public sanitary sewer system by certain dates will be identified.

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POLICY 2.7: By 2028, the county shall provide sanitary sewer service to at least five (5) subdivisions identified in Table 3.A.3.1 as posing a disproportionately high potential negative impact on Indian River Lagoon water quality. The county shall recover costs through those connecting to the system and directly benefitting from the improvement.

OBJECTIVE 3 Surface Water and Groundwater Quality

Through the time horizon of the plan, the county will have no instances of sanitary sewer facilities contaminating surface water or groundwater resources.

POLICY 3.1: The ~~IRCHD~~ DOH-Indian River shall conduct annual inspections of septic ~~tanks~~ systems that are associated with heavy commercial, industrial, and manufacturing or equivalent uses. The results of these inspections ~~shall~~ may be used ~~to prioritize~~in conjunction with other items in prioritizing sanitary sewer service expansion.

POLICY 3.2: The county shall regularly monitor all centralized sanitary sewer facilities to ensure that they do not contaminate surface water or groundwater resources.

POLICY 3.3: To ensure that hazardous waste is not discharged into ground or surface water, the ~~IRCHD~~ DOH-Indian River shall require~~conduct random~~ samplings of on-site sewage systems for businesses which have been identified as hazardous waste generators suspected of illegal discharges. Violators shall be prosecuted according to federal, state and/or local regulations.

OBJECTIVE 4 Water Conservation

Through the time horizon of the plan, 100% of the wastewater effluent produced by the county centralized sanitary sewer facilities will be reused.

POLICY 4.1: The county shall continue to reuse wastewater by spray irrigation, with percolation ponds and wetlands as back-up.

POLICY 4.2: The county shall ~~require~~encourage large volume irrigation users, such as developments with golf courses, to use reuse water for spray irrigation.

POLICY 4.3: The county shall continue to enforce Land Development Regulations that require developments that use treated wastewater for spray irrigation to construct and dedicate to the county the effluent transmission lines needed to transport the effluent to the development.

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POLICY 4.4: The county shall require all new subdivisions or residential projects of 25 or more lots/units within one-quarter of a mile of an existing re-use line to connect to the re-use line when capacity exists.

OBJECTIVE 5 Capital Improvements

By ~~2014~~2022, the county will have completed the sanitary sewer improvements listed in the county's 5 year Capital Improvements Program in order to maximize the use of existing facilities and discourage urban sprawl (current Five Year Capital Improvements Plan ~~shown in Appendix A~~is in the Capital Improvements Element of the comprehensive plan).

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 three 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 the urban 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

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- 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 shall treat sanitary sewer provision as an enterprise system which is financially self-supporting.

POLICY 5.5: The County Utilities Department shall fund sanitary sewer capital improvements and expansions through user fees, ~~impact fees~~capacity charges, developer's agreements, assessments and other appropriate fees and funding mechanisms.

POLICY 5.6: The county shall identify and pursue opportunities for state and federal ~~sources of~~ funding ~~available~~ for the improvement and expansion of utility services including septic to sewer conversion projects and sewer connections.

POLICY 5.7: All improvement~~s~~, replacement, expansion, or increase in capacity of county facilities shall be consistent with adopted level of service standards for facilities.

POLICY 5.8: Consistent with the policies of the Future Land Use Element of this plan, provision of centralized sanitary sewer 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 sanitary sewer line that is part of the county sanitary sewer 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 Future Land Use Map, and the provision of centralized sanitary sewer service shall not be justification for an increase in maximum density; and

    - Any and all costs associated with connecting a property to the sanitary sewer system, including costs associated with survey, design,

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permitting, line extensions, construction, pumps and lift stations, restoration, inspections, and certification, 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;
    - clustering of residential development within privately owned upland conservation areas;
    - clustered development within mixed use districts;
    - traditional neighborhood design communities;
    - public facilities such as public schools; and
    - agricultural businesses and industries (including biofuel facilities)

- Areas where, consistent with Sanitary Sewer Sub-Element Policy 2.4, the lack of centralized sanitary sewer service is determined to be a public health threat.

POLICY 5.9: The county shall install automatic air release valves in all new sewer lines.

OBJECTIVE 6 Package Treatment Plants

Through the time horizon of the plan, there shall be no instances of package treatment plant failures, or illegal or unsafe package treatment plant discharges.

POLICY 6.1: The county shall limit the use of package wastewater treatment systems to areas that meet the following criteria governing connection to the county sanitary sewer system:

- Development served by existing package treatment plants may continue to treat their sewage in that manner until centralized service becomes available. At that time, all development within ¼ mile of a county sewer line shall be connected to the county system. Development whose sewage treatment systems causes a public health problem must connect to the regional system regardless of the distance to sewer lines.

- Package 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:

    - clustering of residential development within agricultural areas;

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- clustering of residential development within privately owned upland conservation areas;
- clustering development within mixed use districts;
- tradition neighborhood design communities; or
- agricultural businesses and industries (including biofuel facilities)

POLICY 6.2: The county shall ensure that, prior to the issuance of development orders or permits, the applicant has demonstrated that the project complies with applicable federal, state, and local permit requirements for package treatment plants.

POLICY 6.3: The county shall require that issuance of permits for replacement or expansion of existing package 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 the sub-element.

POLICY 6.4: To ensure proper maintenance and operation, the ~~Utilities Department shall~~ DEP shall inspect all package treatment plants on an annual basis.

POLICY 6.5: The county shall require all new package wastewater treatment plants to be built according to current federal, state, and county requirements. In addition to obtaining a county permit demonstrating compliance with county regulations, any developer building and operating a package wastewater treatment plant must obtain a state permit demonstrating compliance with state and federal regulations. Those regulations include but are not limited to the Federal Water Pollution Control Act of 1972 (PL 92-500) and its amendments through the Clean Water Acts of 1977 (PL 95-217) and 1981 (PL 97-117), Chapters 381 and 403 of the Florida Statutes, and Rules 17-3 and 17-6 of the Florida Administrative Code. 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 any new package treatment plants, the county will require, that at the time deemed appropriate by the county, the package treatment plant and associated sewer collection system shall be dedicated to the county for operation and maintenance without compensation.

POLICY 6.7: The county shall continue to enforce ordinances requiring pre-treatment of commercial and industrial waste before discharge into the county system.

POLICY 6.8: The county shall require all future connections to the regional sanitary sewer system to be consistent with the attached water and wastewater connection matrix.

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OBJECTIVE 7 Septic ~~Tank~~ Systems

By 2020, the number of new septic ~~tank~~ systems permitted annually will not exceed ~~450~~200.

POLICY 7.1: The county shall limit the use of septic ~~tank~~ systems to areas that meet the following criteria governing connection to the county sanitary sewer system:

- ~~With the exception of those identified in Table 3.A.3, residential subdivisions served by existing septic tank systems may continue to treat their sewage in that manner.~~

- Commercial/industrial uses and residential subdivisions identified in Table 3.A.3 may continue to treat their sewage with existing septic ~~tank~~ systems until centralized sewer service lines are extended to within ¼ mile of the site. At that time, all residential units in those subdivisions and all commercial/industrial uses shall be connected to the county system. Developments whose sewage treatment systems cause a public health problem must connect to the regional system regardless of the distance to sewer lines.

- Use of septic ~~tank~~ systems for new development shall be prohibited unless:

    - such development meets the criteria set on the water and wastewater connection matrix; or
    - such development consists of clustered residential development within privately owned upland conservation (C-3) areas. Even under those circumstances, no individual septic ~~tank~~ systems may be associated with individual residential units. If located outside of any conservation designated areas or areas that are environmentally sensitive or significant, however, centralized community septic ~~tank~~ systems may be provided to each pod of clustered residential development.
    - Septic ~~tank~~ systems 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)

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POLICY 7.2: The county shall ensure that, prior to the issuance of development orders or permits for projects to be served by septic ~~tank~~ systems, the applicant has demonstrated that the project complies with Florida Department of Health (DOH) regulations Section 381.0065 FS and ~~Rule~~ Chapter 64E-6, FAC, permit requirements for septic ~~tank~~ systems.

POLICY 7.3: The county in coordination with and through the DOH-Indian River, shall require that issuance of permits for repair or replacement of existing septic ~~tank~~ systems 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.~~ with DOH regulations Section 381.0065 FS and Chapter 64E-6, FAC, permit requirements for septic systems.

POLICY 7.4: The county, in coordination with and through the ~~IRCHD~~DOH-Indian River, shall establish public education programs on the proper use, inspection requirements, maintenance, and abandonment of septic ~~tanks~~systems. The ~~tank~~ septic system abandonment process shall be based on current state and local regulations.

POLICY 7.5: Consistent with Section 381.00651 FS and in coordination with and through the DOH-Indian River, the County shall encourage a voluntary opt-in provision for septic system maintenance and encourage contractors that provide septic maintenance to document information.

POLICY 7.6: The County, in coordination with and through the DOH-Indian River, shall encourage all septic systems including repairs and modifications to meet a 24 inch separation between the bottom of the drainfield and the wet season water table and meet 75 foot setbacks from surface waterbodies and wells.

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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 Sanitary Sewer 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.A.6 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 Sanitary Sewer Sub-Element, several different types of actions must be taken. These include: expansion of plant capacity, extension of the collection network, enforcement of land development regulations and ordinances, execution 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.A.6, 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.

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TABLE 3.A.6 - SANITARY SEWER SUB-ELEMENT IMPLEMENTATION MATRIX

POLICY#	TYPE OF ACTION	RESPONSIBILITY	TIMING	CAPITAL EXPEND.
1.1	Land Development Regulations	Planning	Ongoing	NO
1.2	Monitoring Procedures	~~Utilities~~DEP	Ongoing	NO
1.3	Land Development Regulations	Planning	Ongoing	NO
1.4	Monitoring Procedures	Utilities/Planning	Ongoing	NO
1.5	Summary Reports	Planning	As Needed	NO
1.6	Land Development Regulations	Utilities/~~IRCHD~~DOH - INDIAN RIVER	Ongoing	NO
2.1	Service Provision	Utilities	Ongoing	YES
2.2	Service Provision	Utilities	Ongoing	NO
2.3	Evaluation Process/ Service Provision	Utilities/~~IRCHD~~DOH - INDIAN RIVER	Ongoing	YES
2.4	Evaluation Process/ Service Provision	Utilities/~~IRCHD~~DOH - INDIAN RIVER	Ongoing	YES
2.5	Coordination	Utilities/BCC	Ongoing	NO
2.6	~~Feasibility Study~~Septic to Sewer Study	Utilities~~/Planning~~	Ongoing	NO
2.7	New Service to Existing Subdivisions on Septic Systems	Utilities	Ongoing	YES
3.1	Annual Inspections	~~IRCHD~~DOH - INDIAN RIVER	Ongoing	NO
3.2	Monitoring Procedures	Utilities	Ongoing	NO
3.3	Monitoring Procedures	~~IRCHD~~DOH - INDIAN RIVER	Ongoing	NO
4.1	Reuse Water by Spray Irrigation	Utilities	Ongoing	NO
4.2	Land Development Regulations	Utilities	Ongoing	NO
4.3	Land Development Regulations	Utilities	Ongoing	NO
4.4	Land Development Regulations	Utilities	Ongoing	NO

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POLICY#	TYPE OF ACTION	RESPONSIBILITY	TIMING	CAPITAL EXPEND.
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 Development Regulations	Finance/Utilities	Ongoing	NO
5.5	Land Development Regulations	Utilities	Ongoing	YES
5.6	Funding Mechanism	Utilities/Finance	Ongoing	NO
5.7	Improvement/ Replacement/Expansion	Utilities	Ongoing	YES
5.8	Land Development Regulations	Utilities/Planning	Ongoing	NO
5.9	Installation of Air Release Valves	Utilities	Ongoing	Yes
6.1	Land Development Regulations	Utilities/Planning	Ongoing	NO
6.2	Land Development Regulations	Utilities/Planning	Ongoing	NO
6.3	Land Development Regulations	Utilities/Planning/ ~~IRCHD~~DOH - INDIAN RIVER	Ongoing	NO
6.4	Plant Inspections	~~Utilities~~DEP	Ongoing	NO
6.5	Land Development Regulations	Utilities/Planning	Ongoing	NO
6.6	Land Development Regulations	Utilities/Planning	Ongoing	NO
6.7	Land Development Regulations	Utilities	Ongoing	NO
6.8	Land Development Regulations	Utilities/Planning	Ongoing	NO
7.1	Land Development Regulations	Utilities/Planning	Ongoing	NO
7.2	Land Development Regulations	Utilities/Planning/ ~~IRCHD~~DOH - INDIAN RIVER	Ongoing	NO

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POLICY#	TYPE OF ACTION	RESPONSIBILITY	TIMING	CAPITAL EXPEND.
7.3	Land Development Regulations	Utilities/Planning/ ~~IRCHD~~DOH - INDIAN RIVER	Ongoing	NO
7.4	Public Education Program	Utilities/ ~~IRCHD~~DOH - INDIAN RIVER	Ongoing	NO
7.5	Septic Maintenance and Reporting	DOH - INDIAN RIVER	Ongoing	NO
7.6	Septic System Improvements	DOH - INDIAN RIVER	Ongoing	NO

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EVALUATION AND 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. Since objectives are measurable and have specific timeframes, the plan's objectives are the benchmarks used as a basis to evaluate the plan.

Table 3.A.7 identifies each of the objectives of the Sanitary Sewer Sub-Element. It also identifies the measures to be used to evaluate progress in achieving these objectives. Most of these measures are quantitative. Besides the measures, Table 3.A.7 also identifies timeframes associated with meeting the objectives.

The utilities department staff will be responsible for monitoring and evaluating the Sanitary Sewer 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 county will continually monitor facility capacity to ensure that wastewater level-of-service standards will be maintained.

While monitoring will occur on a continual basis, formal evaluation of the Sanitary Sewer 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 Sanitary Sewer Sub-Element objectives should be modified or expanded. In this way the monitoring and evaluation of the Sanitary Sewer 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.

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TABLE 3.A.7 - SANITARY SEWER SUB-ELEMENT EVALUATION MATRIX

OBJECTIVE #	MEASURE	TIMEFRAME
1	Availability of Sufficient Capacity	Through the time horizon of the plan
2	% connected to regional system	By ~~2015~~2020
3	# of instances of sanitary sewer facilities contaminating surface water or groundwater resources	Through the time horizon of the plan
4	% of wastewater effluent reused	Through the time horizon of the plan
5	Completed improvements	Through the time horizon of the plan
6	# of package treatment plant failures and # of illegal or unsafe package treatment plant discharges	Through the time horizon of the plan
7	# of new septic ~~tank~~ systems permitted annually	By 2020

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TABLE 3.A.8 - WATER & 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

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non-residential establishment which can utilize a private system shall be made by the Utilities Department, Community Development Department, and ~~Environmental Health Department~~ DOH – Indian River.

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.

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terrace extends into and beyond the northwest corner of the county and reaches elevations of approximately 40 feet above sea level.

The topography of the county is depicted in Figure 2.17. Overall, the relatively flat terrain of the county poses few constraints to development as compared to a rough or rugged terrain. The topography is also a key feature in the natural drainage system and must be examined along with other natural features to identify development opportunities and constraints. These potential opportunities and constraints are addressed in the analysis section of this element and examined in the Conservation, Coastal Management, and Infrastructure Elements.

Soils

Soils can greatly influence the value or development potential of land. On farmland, those soils which are rich in nutrients provide the potential for high crop yields, while other soils require extensive fertilization and treatment. Generally, structures cannot be built on soils with poor load bearing capacity unless costly methods are employed to overcome the problem. Soils can also severely limit the use of sanitary facilities such as ~~septic tank~~septic systems and landfills. While wet soils often cannot accommodate ~~septic tank~~septic systems, ground water can be polluted in highly permeable soils. Those soils with high water tables may also indicate the existence of a wetland vegetative community.

In Indian River County, the United States Soil Conservation Service has identified 58 different soil types. These soils are further classified into thirteen generalized soil types and distributed among five physiographic areas of the county as follows: sand ridges; coastal islands and tidal marshes; flatwoods, low knolls and ridges; sloughs, poorly defined drainage ways and hammocks; and freshwater swamps and marshes. The generalized soil types are depicted in Figure 2.18.

The suitability of soils for development is discussed in the analysis section of this element and in greater detail in the Conservation and Coastal Management Elements.

Water transportation is provided on the Intracoastal Waterway in the Indian River Lagoon. This federally maintained water route traverses the length of the county. The nearest deepwater ports are located at Ft. Pierce to the south and Port Canaveral to the north.

In Indian River County, rail service is provided by the Florida East Coast Railroad (FEC). The FEC maintains single and double tracks just west of and parallel to US 1. The nearest FEC freight yard is in Ft. Pierce.

Aviation, Ports, and Rail issues are also discussed in the Transportation Element.

Sanitary Sewer

Generally, wastewater is a service that has traditionally been supplied by local government. In addition to the more technologically sophisticated and efficient central systems, traditional methods of wastewater treatment, including ~~septic tank~~septic systems, are still employed in Indian River County.

The primary purpose of wastewater treatment is to remove solids and toxic chemicals from wastewater and render organic wastes inert. After treatment, the resulting water product is then reintroduced into the natural water cycle.

Presently, there are five publicly operated regional wastewater treatment plants operating in the county. Four of those plants are operated by the Indian River County Utilities Department, while the other plant is operated by the City of Vero Beach. There are also three privately-operated package treatment plants in the county.

While the county operated plants provide a level of service of 250 gallons/residential unit/day, the city operated plant provides a level of service of 197 gallons/residential unit/day. The combined design capacity of the regional plants is ~~13,370,000~~ 17,350,000 gallons/day, an amount sufficient to accommodate their combined average daily demand of ~~8,274,000~~ 8,780,000 gallons/day.

Currently, the service area of the regional system includes substantial portions of the urban area of the county. As such, wastewater lines extend to much of the county's urban area, including portions of all three of the commercial/industrial nodes along I-95. In 2006, the county utilities department had ~~24,250~~ 28,167 sanitary sewer customers.

With respect to ~~septic tank~~septic systems, the Department of Health in Indian River County (DOH-Indian River)~~Public Health Unit, Division of Environmental Health~~, currently estimates that there are ~~approximately~~ more than 36,039 ~~septic tank~~septic systems in use in Indian River County. While approximately ~~1,272~~ 121 new ~~septic tank~~septic systems were installed in 20~~0~~16 in the county, that number has decreased significantly in more recent years as the level of residential construction has declined.

Within the county, many of the older residential areas were developed with well and septic ~~tank~~ systems on lots which, by today's standards, are small in size. The small lot size in those areas often results in inadequate separation distances between wells and ~~septic tank~~septic systems. For that reason, some of those areas have experienced contamination of wells.

To address that health problem, county policy has been to connect those areas to the regional potable water system. Because connection to the regional potable water system is usually sufficient to eliminate health risks, connection of those areas to the regional sanitary sewer system has been on a much more limited basis.

Wastewater and sanitary sewer systems are addressed more fully in the Sanitary Sewer Sub-Element of the Infrastructure Element and in the Capital Improvements Element. The impact of those systems is also addressed in the Conservation Element.

Potable Water

Water is essential to human life and is a key ingredient in agriculture, commerce and industry. Traditionally, water in urban areas has been provided by local governments, while in rural areas individual wells or water systems have sufficed. This pattern is also present in Indian River County; however, it is not uniform in all areas of the county.

In Indian River County, the water delivery system is composed of private wells and public water systems. The potable water system is discussed in greater detail in the Potable Water Sub-Element and the Capital Improvements Element. Groundwater sources are discussed in the Natural Groundwater Aquifer Recharge Sub-Element and the Conservation Element.

As with the county's population distribution, water systems other than private wells are primarily limited to the developed eastern third of the county land area. Currently, there are four publicly owned regional water treatment plants operating in the county. Two of those plants are operated by the Indian River County Utilities Department, while the other plants are operated by the City of Vero Beach and the City of Fellsmere. While the county-operated plants provide a level of service of 250 gallons/residential unit/day, the Vero Beach and Fellsmere plants provide a level of service of 351 and 200 gallons/residential unit/day, respectively. The combined design capacity of those plants is 24,720,000 gallons/day, an amount sufficient to accommodate their combined average daily demand of 15,990,000 gallons/day.

The plants operated by the county Utilities Department use the Floridan Aquifer as their primary water source. While the City of Vero Beach uses both the Surficial and Floridan Aquifers, the City of Fellsmere uses only the Surficial Aquifer. Because water drawn from the Floridan Aquifer contains impurities, that water must be treated to become potable. For water drawn from the Floridan Aquifer, the type of treatment used by both the city and county plants is reverse osmosis. For water drawn from the Surficial Aquifer, a lime softening treatment process is used.

A by-product of the reverse osmosis process is brine; brine is water with a high concentration of impurities. That brine is then treated prior to being discharged.

Future Land Use Map, the 106,661 units projected at build-out represent fewer units than the maximum allowed by the Future Land Use Map. If single-family development continues to occur at densities substantially less than the maximum allowed by the by Future Land Use Map, then it can be expected that the unincorporated county's build-out potential will be reduced in the future.

Currently, comprehensive plan policies direct the vast majority of residential development to land inside the urban service area. Of the projected 106,661 residential units at build-out, 96,029 units (or 90%) will be located inside the urban service area. The remaining 10,632 units will be located outside of the urban service area.

Because of the recent municipal annexations and the future land use plan densities expected to be assigned to those annexed areas, the build-out potential for the total county has increased significantly. Upon build-out, it is projected that the unincorporated county and the county's municipalities will contain 188,848 residential units. At that time, the county's five municipalities will contain 82,187 residential units. Of these residential units, 49,474 residential units will be in the City of Fellsmere, while the remaining 32,713 residential units will be located in the county's other municipalities.

Use Suitability of Soil

Within the county, soils can limit development activity in two major ways: load bearing capacity and suitability for sanitary facilities. Those characteristics are addressed in the United States Department of Agriculture Soil Conservation Service's soil survey for Indian River County. In addition to mapping the different soils, the survey also provides an analysis of the soils. The analysis, which includes the physical, chemical, and hydric composition of each soil type, provides a basis to evaluate the soil potential for different uses. Table 2.12 is a summary of soil ratings and limitations from the Soil Survey. (Soils are also discussed in the Conservation Element). That table indicates that most soils in the county present severe limitations for site development and sanitary facilities.

Usually, building limitations are due to the wetness of the soil. The wetness of the soil can result in the ponding of water, flooding and caving of excavation. The wetness also presents severe limitations to sanitary facilities and, in particular, to ~~septic tank~~septic systems. Since wetness and ponding lead to poor filtering and slow percolation, wet soils are unable to adequately drain.

Within the county, those limitations can be reduced through the use of certain building techniques and standards. Those techniques and standards include raising the elevations of sites through the use of fill dirt and enhancing the natural drainage area of development projects.

Throughout the county, ~~septic tank~~septic systems are permitted by the ~~Environmental Health Department~~DOH-Indian River. To ensure that adequate sanitary facilities are provided for sites not connected to the county's centralized sanitary sewer system, county building regulations require the issuance of a septic permit prior to issuance of a building permit. Several standards

used by the ~~Environmental Health Department~~DOH-Indian River to guarantee the viability of septic systems include: a minimum ~~septic tank~~septic system elevation requirement of 48" above the wet season water table; a minimum separation distance requirement between ~~septic tank~~septic systems and potable water wells of 75 feet; and a limitation on total building square footage based on lot size and drainfield requirements.

Because of the limitations associated with on-site septic systems, the county's policy should be to expand the public sanitary system throughout the urban service area. The Sanitary Sewer Sub-Element provides additional analysis of ~~septic tank~~septic system suitability in the county and the regulatory framework under which ~~septic tank~~septic systems are permitted.

Table 2.12, Soil Characteristics and Suitability

Soil Drainage	Corrosivity		Irrigation	Septic Fields	Dwellings	Pond
	Steel	Concrete				
Poorly Drained	Moderate to High	Low to High	Wetness, Droughty, Fast intake	Severe limitations – Wetness, Percolates slowly	Severe limitations – Wetness	Severe Limitations – Seepage
Moderately Drained	Low to Moderate	Low to Moderate	Wetness, Droughty, Fast intake	Severe Limitations – Percolates slowly, Poor filtering	Slight to Severe Limitations – Wetness	Severe Limitations – Seepage
Excessively Drained	Low	Moderate to High	Droughty, Fast intake, Soil blowing	Slight – Very poor filtration. Potential for groundwater contamination	Slight	Severe Limitations – Seepage

Data Source: U.S.D.A. - Soil Conservation Service

Figure 2.26 shows soil characteristics which present severe limitations to development.

Use Suitability of Topography

The topography of Indian River County is generally flat with the exception of several ridges. Due to the lack of rough or rugged terrain, topography does not present any major limitations to development. Only a few areas along the coastal ridge have slopes steep enough to constrain development.

Overall, topography is one of the principal influences on the drainage system. Because much of the county consists of relatively low flatlands, many of those areas, including the highly developed eastern mainland, would be underwater for portions of the year without man-made drainage ditches and canals. There are, however, certain county areas, such as the barrier island, the sand ridges, the St. Sebastian River area, and the higher elevations in the western county, which have a topography that results in the natural runoff of stormwater.

Going forward, the county's policy should be to require that stormwater runoff from new development does not negatively impact adjacent properties or receiving water bodies. Because of the county's flat terrain, stormwater management systems are necessary to direct and retain

- Groundwater Recharge Areas

Underlying Indian River County are two aquifers that provide county residents with all water for domestic consumption. Those aquifers are recharged or filled by the percolation of rain and surface water through soil layers into the underground reservoirs. Those areas which provide the greatest potential for recharge are classified as "Prime Recharge Areas" and are shown on Figure 2.29. While excessive development of those areas can result in changes to natural drainage patterns and reduce recharge potential, excessive use of ~~septic tank~~septic systems and hazardous materials in those areas can increase the possibility of contamination of the aquifer.

For the county public water system, the public water supply source is the deep aquifer which, because of its depth, is less likely to be subject to contamination from ground sources. Recharge areas for that aquifer are located northwest of the county.

Within the county, those areas which contain community wells that draw large quantities of water are especially subject to contamination or pollution. Generally, groundwater contamination can result from excessive or improper use of septic systems and other wastewater treatment facilities, the leakage of chemicals and fuels stored underground, seepage from landfills and other waste storage areas, or surface spills of hazardous materials. For each of the community wells or wellfields in the county, zones of influence have been calculated. Those zones vary in size due to the amount or volume of flow, depth of the well and the porosity of the aquifer. Within those zones, the county's policy should restrict uses that could contaminate community wells.

➢ Summary of Use Suitability of Natural Resources

Overall, the natural features of the county provide various constraints to development, many of which can be overcome through modern building and engineering techniques. In fact, one natural resource constraint that has been mitigated through engineering is drainage. With respect to drainage, large areas of the county would be underwater, if it were not for the county's extensive system of drainage canals and ditches.

In some cases, modifications are relatively simple and provide minimal adverse impacts to the environment. Where only slight modification is required, areas are generally suited for most types of development. Other areas require extensive man made improvements to achieve even the lowest intensity of development. Often those improvements include the wholesale destruction of important and sensitive habitats. In those areas, development should be kept to a minimum and highly regulated to ensure the protection of natural features and resources.

Figure 2.30 is a composite of the natural constraints in the county. In those areas which contain severe constraints, the county's policy should be to restrict development.

A review of existing development and natural land uses reveals the following important facts:

- destruction of natural areas is most evident in the eastern portion of the county, especially waterfront areas along the Indian River and on the barrier island;

- continued reliance on ~~septic tank~~septic systems increases the potential for pollution of the shallow aquifer;

- the use of ~~septic tank~~septic systems in soils which are not suited for ~~septic tank~~septic systems and development in areas with low elevations require large amounts of fill dirt obtained by mining;

- the large amounts of runoff that result from development can lead to the need for expensive drainage improvements, pollution of natural water bodies, and localized flooding; and

- development of wetlands, woodlands and other natural areas results in the destruction of natural habitat, upsetting the natural balance of the ecosystem.

Wherever development occurs, the natural state of the land is altered, most of it without serious consequences. Certain areas, however, are of such a sensitive nature that their alteration can lead to serious problems for nature and humans alike. In the past, much of the land area of the county was drained and cleared for agriculture. While it is impossible to preserve all natural areas, development policies and land use regulations can and should protect sensitive areas and limit the destruction of the environment.

permit the transfer of development rights, and promote the use of conservation easements, dedications, and public acquisition.

Policy 7.4: Any development activity in areas designated as environmentally sensitive or important, as defined in policies 5.4 and 6.11 of the Conservation Element, shall require an environmental survey as part of the approval of a development order. Based upon the results of the environmental survey, development projects shall be required to provide a site design which minimizes impacts upon endangered and threatened plants and animals.

Policy 7.5: The county shall review and evaluate proposed development projects to ensure that stormwater runoff from the new development will not negatively impact adjacent properties or receiving surface waterbody quality.

Policy 7.6: Indian River County shall maintain and enforce regulations to protect wetlands from the negative impacts of development. These regulations address building setbacks, protection from solid and liquid wastes including pesticides and herbicides, dredging or filling of wetlands, incorporation of wetlands into a site's development scheme, and mitigation of lost or destroyed wetlands.

Policy 7.7: Indian River County acknowledges the environmental importance of the prime aquifer recharge areas shown on Figure 2.29. The county shall regulate the development of these areas. Regulations include an overlay district which restricts land uses, implements special siting requirements for ~~septic tank~~septic systems to mitigate soil drainage characteristics, and regulates other factors which impact the recharge capability of the land.

Policy 7.8: The county shall protect public water supply wells by prohibiting the placement of septic systems; stormwater retention/detention areas; wastewater treatment plant effluent discharges, including but not limited to percolation ponds, surface water discharge, spray irrigation, and drainfields; sanitary landfills, feed lots and other concentrated animal facilities; mining and excavation activities; and the handling, production, and storage of regulated substances within wellfield cones of influence.

Policy 7.9: Consistent with the Potable Water Sub-Element, the county shall continue to extend the county water system, enabling the acquisition of small public water systems, thereby reducing the number of residents using the shallow aquifer, which is subject to groundwater pollution threats.

Policy 7.10: Through the use of fee simple purchase, transfer of development rights, and conservation easements, Indian River County shall coordinate with other state, federal and local agencies to identify and protect vegetative communities identified in Conservation Element policies 6.1 through 6.7.

Policy 7.11: The county, in cooperation with the local ~~Environmental Health Department~~DOH-Indian River, shall continue to regulate the siting of ~~septic tank~~septic systems including siting requirements to mitigate soil characteristics.

OBJECTIVE 8: PROTECTION OF HISTORIC RESOURCES

Through 2015, at least 95% of unincorporated Indian River County's historic properties (as identified in "Historic Properties Survey of Indian River County, Florida", prepared by Historic Property Associates, Inc., April 1989) will continue to be preserved in fair, good, or excellent condition.

Policy 8.1: The county historian and, as needed, outside consultants and experts shall provide guidance and advice to the Board of County Commissioners on matters concerning historic and archaeological preservation. The county historian shall be consulted for recommendations concerning:

- proposed changes to county regulations protecting historic and archaeological resources; and
- projects which may impact historical and archaeological sites identified on the Florida Master Site File or designated as significant by the Board of County Commissioners.

Policy 8.2: Indian River County shall use incentives such as transfer of development rights, tax relief, mitigation, and public acquisitions; and penalties such as fines and imprisonment, to protect and preserve historically and archaeologically important resources. The following criteria are used to determine the historical significance of a resource:

- whether or not the resource is at least 50 years old;
- whether or not the resource contains significant character, interest or value as part of the historical, cultural, aesthetic and architectural heritage of the county;
- whether or not the resource displays historical, political, cultural, economic, or social trends of community history;
- whether or not the resource displays unique and/or distinguishing characteristics of an architectural style, design period, construction method, detail, craftsmanship, or material; and
- whether or not the resource is a work by a prominent architect, designer, engineer, builder or landscape architect.

Policy 8.3: All public and private development or redevelopment proposals shall be reviewed for their impact upon designated historic resources.

Policy 8.4: Public and private development and redevelopment activities shall cease, at least temporarily, if historic or archaeological artifacts are discovered, in order to allow for evaluation of historic significance.

These counterclockwise-rotating, extreme low pressure storms can reach ten miles in height, can spread over several hundred miles in diameter, and can generate winds in excess of 74 miles per hour (MPH), the minimum wind speed necessary to be classified as a hurricane. The official hurricane season extends from June 1st to November 30th, with 62 percent of all Florida hurricanes occurring during September and October.

While extensive rainfall commonly occurs during a hurricane and may cause widespread inland flooding, the greatest danger associated with a hurricane is storm surge. Storm surge can be described as the rise in wave and tidal heights associated with a hurricane. The vulnerability of an area to storm surge is dependent upon the potential height that a storm surge can achieve along a particular coast and the distance to which the surge can penetrate inland upon making landfall. Thus, low-lying coastal topography, such as inlets, beaches and estuaries, are especially susceptible to the destructive forces of a storm surge (Hurricane Manual for Marine Interests in Indian River County).

• Coastal High Hazard Area

The Coastal High Hazard Area (CHHA) is defined as the area below the storm surge line of a Category 1 hurricane as established by a Sea, Lake, and Overland Surges from Hurricanes (SLOSH) computer model. The CHHA is depicted in figure 9.11.

As of 2018, Indian River County has also designated the CHHA as an "Adaptation Action Area" (AAA) in accordance with Section 163.3164(1) F.S and in support of Objective 15 of this Element and its associated policies. An AAA is defined as one or more areas that experience coastal flooding due to extreme high tides and storm surge, and that are vulnerable to the related impacts of rising sea levels for the purpose of prioritizing funding for infrastructure needs and adaptation planning.

Within the CHHA, most of the land is designated for residential use, with permitted densities ranging from 3 to 10 units per acre. A substantial portion of this land is currently developed. Much of that development took place at a time when the CHHA was more narrowly defined as land on the barrier island, east of the Coastal Construction Control Line (CCCL).

• Hurricane Vulnerability Zone

Although many areas are subject to coastal flooding associated with the severe weather of hurricanes, other areas face imminent danger from the storms. Those areas which face severe erosion, flooding, storm surge, or other direct storm related damages from a Category III hurricane constitute the Hurricane Vulnerability Zone (HVZ). The HVZ is depicted in Figure 9.12. This zone has been identified for special planning and evacuation purposes.

• Comprehensive Emergency Management Plan

In accordance with Chapter 252, F.S., Indian River County has adopted a Comprehensive Emergency Management Plan (CEMP). The CEMP replaces the Peacetime Emergency Plan (PEP), the Florida

Line" (D.S.S.L.). Other than approved dune walkovers, minor structures or erosion control projects, construction is not allowed seaward (east) of this regulatory line.

Within Indian River County, the Coastal Barrier Resource Act (CoBRA) recognizes and discourages development in two areas: an area south of Ambersand Beach on the northern portion of the barrier island; and an area in the southern portion of the barrier island near the Indian River - St. Lucie County line.

Because these relatively undeveloped areas are recognized as having the greatest potential for storm damage, federal flood insurance is unavailable in these areas. Should a Category V storm event occur, much of the barrier island and particularly the areas identified by CoBRA could be completely destroyed.

Even with significant measures in place to reduce potential storm damage, hurricanes Francis and Jeanne in 2004 caused wide-spread damage to structures along the beach as well as structures inland.

Sea Level Rise

Sea level rise (SLR) is typically defined in terms of either global (eustatic) sea level rise or relative sea level rise. Global sea level rise represents the average change in the height of all of Earth's oceans relative to the land. Conversely, relative sea level rise refers to measured changes in sea level height at specific locations on land relative to localized variations in land elevation, including changes due to ocean rise and/or land subsidence.

Global sea level rise is directly influenced by fluctuations in the mass or volume of the ocean. Fluctuations in the volume of the ocean are the result of climatological and geological forces such as thermal expansion and contraction, tectonic shift, lift/subsidence, and sedimentation, while ocean mass is affected by factors including melting or accretion rates of glaciers, snow accumulation, and global water storage and redistribution mechanisms. Based on the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5), many of these climate related phenomena have been directly influenced by greenhouse-gas emissions increases since the pre-industrial era and other feedback mechanisms. With respect to SLR, the IPCC AR5 indicates that global average land and ocean surface temperatures will likely continue to increase and contribute to the acceleration of SLR encountered in the future.

In Florida, baseline relative sea level measurements can be derived from historical tide gauge records of mean monthly sea level. In fact, average monthly sea level measurements have been recorded at tide stations located in Key West, Cedar Key, and Fernandina Beach for more than a century. The yearly averages of these historic data, depicted in Figure 9.14, indicate a gradual trend of rising mean sea level between 1897 and 2017. Moreover, these data highlight regional variability that may be observed among local relative sea level datasets. Based on those data sets, sea levels at Key West, Cedar Key, and Fernandina Beach rose approximately 12.72", 12.66", and 15.63" over the last 100 years.

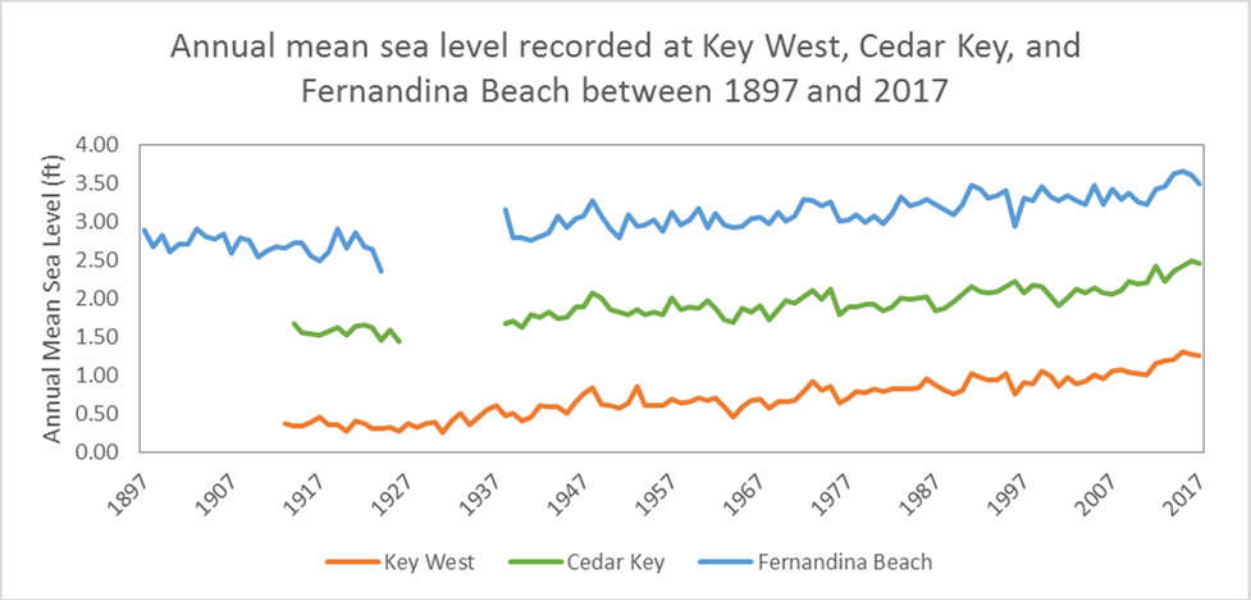

Figure 9.14: Annual mean sea level recorded at Key West, Cedar Key, and Fernandina Beach between 1897 and 2017. Data obtained from the National Oceanic and Atmospheric Administration National Ocean Service.

Regional mapping and vulnerability assessment studies related to sea-level rise (SLR) were initially developed by federal, state, and local government agencies in the early 2000s. Circa 2009, development of consistent regional climate change adaptation strategies became the basis for formation of the Southeast Florida Regional Climate Change Compact (SFRCCC), which was represented by four coastal counties, Monroe, Miami-Dade, Broward, and Palm-Beach. The SFRCCC created a Unified Sea Level Rise Projection for Southeast Florida in 2011 based on U.S. Army Corps of Engineers Engineering Circulars guidance documents, historical tidal data from Key West (1913-1999), and available scientic literature on the subject at the time. This Unified SLR Projection was later revised in 2015 based on updated guidance documents from USACE, NOAA, and the United Nations Intergovernmental Panel on Climate Change (IPCC) (Figure 9.15). According to the revised projection the region may experience between 14 and 34 inches of sea level rise (above 1992 mean sea level) by 2060.

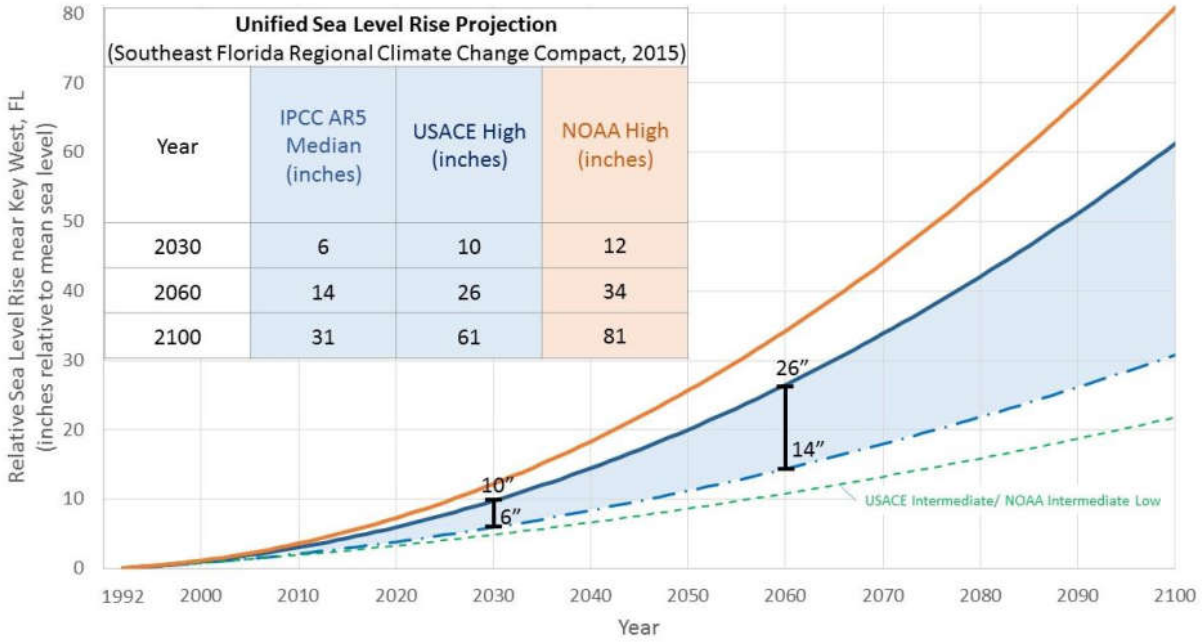

Figure 9.15: SFRCCC Unified Sea Level Rise Projection (2015). Source: Southeast Florida Regional Climate Change Compact Sea Level Rise Work Group (Compact). October 2015. *Unified Sea Level Rise Projection for Southeast Florida.* A document prepared for the Southeast Florida Regional Climate Change Compact Steering Committee. 35 p.

Concurrently, the National Oceanographic and Atmospheric Administration (NOAA) Coastal Services Center began development of the web-based SLR and Coastal Flooding Impacts Viewer to aid visualization and adaptation planning efforts for various SLR scenarios. Pilot studies initially focused on specific geographic areas along the coasts of Delaware, Mississippi, and Alabama; however, the viewer (now called the Sea Level Rise Viewer) has been regularly updated to include a broad range of coastal areas, including nearly all of Indian River County east of Interstate 95 (I-95).

For informational purposes, Indian River County was included in a similar SLR vulnerability assessment in 2012 that was coordinated by the Seven50 initiative and the Southeast Florida Regional Partnership, which incorporated methodologies developed by the SFRCCC. The assessment, whose results were presented in the 2013 report "Analysis of the Vulnerability to Sea Level Rise of the Northern SE FL Counties in the Seven50 Planning Region" (Appendix A), evaluated three SLR inundation scenarios (e.g. 1, 2, and 3 feet of inundation) and characterized local geographic areas at potential flood risk due to potential SLR. Baseline land elevation measurements, upon which the one foot, two foot, and three foot inundation levels were mapped, were derived from Light Detection and Ranging (LiDAR) vertical elevation data that were obtained from the NOAA Coastal Services Center. These data were originally collected in 2007 for the Florida Department of Emergency Management (FDEM).

SLR inundation maps depicted flood risks based on two levels of confidence, 80-100% certainty and 20-79.9% certainty, and were categorized as either "more likely" to be inundated or "possibly" inundated, respectively. The local maps presented in the 2013 Seven50 report, provided a clear visual comparison of the magnitude of flood-related impacts that may be encountered in Indian River County under 1, 2, and 3-ft SLR inundation scenarios.

Moreover, other data comparisons were evaluated in the analysis including taxable property value ranges impacted based on inundation level, degree of impacts to higher and lower functional classification roads, and total acres impacted based on future land use designation. Those baseline data provided critical insights for implementation of long range adaptation planning strategies.

ANALYSIS

Land Use

This analysis section addresses issues, problems, and opportunities within the coastal zone. A complete analysis of land use data, including a comparison of land use acreages by classification, is contained in the Future Land Use Element of the Comprehensive Plan.

In the past, comprehensive plan policies, including the Future Land Use Map, have successfully directed new residential and nonresidential development to designated areas of the county. Consequently, there have been few amendments to the land use map and only minor adjustments to the county's Urban Service Area boundary since the county's current comprehensive plan was adopted in 1990. In fact, the only significant changes to the Future Land Use Map in the previous decade have been amendments designating publicly acquired environmental lands for conservation.

Going forward, the major land use issues facing Indian River County in the coastal zone and in the county overall are urban sprawl, rural sprawl, agricultural preservation, and conservation of natural systems within the context of development.

Economy

Generally, the county's economy is limited in diversity and largely reliant on service oriented industries. Despite this current lack of economic diversity, Indian River County has attractive qualities that certain businesses look for. These qualities, which include an available development-ready supply of land and an exceptional quality of life (warm weather, beaches, minimal population density, resource-based recreational opportunities, etc.), will aid the county as it seeks to increase its economic base in the future.

- Eco Tourism

A significant aspect of the County's quality of life is its natural resources, not the least of which is the Indian River Lagoon. Resources such as the lagoon provide significant economic benefits to the county. According to the Indian River Lagoon Economic Assessment and Analysis Update (2007), the total economic impact in 2007 of visitors to the Indian River Lagoon in Indian River County was over $110 million.

Because of its natural assets, as well as cultural heritage, Indian River County has an opportunity to capitalize on ecotourism. From an economic development standpoint, the County, through its County Environmental Lands Program, is actively preserving some of its greatest natural assets and

Indian River Lagoon, the St. Sebastian River, or other surface water bodies, the County's policy should be to promote the connection of waterfront subdivisions to the sanitary sewer system. A complete analysis of sanitary sewer is provided in the Sanitary Sewer Sub-Element.

- Stormwater Management

Since 1990, stormwater management facilities in the county have been designed to handle a 25 year/24 hour storm event, as well as to provide treatment before discharging stormwater runoff. Because many sections of the county were developed prior to 1990, the level of service for stormwater management facilities continues to vary throughout the county. Over the past several years, the county has made progress in reducing flood hazards by constructing stormwater management projects in certain areas of the county with known flooding problems, including Vero Lake Estates, east Gifford and the Rockridge Subdivision. Moreover, projects such as the Sebastian Stormwater Park and the North Relief Canal Pollution Control Facility, described previously in this report, contribute to improved stormwater quality. Despite implementation of these projects, the county needs to continue to identify, seek funding, and construct new stormwater improvement projects in areas where needed. A more complete analysis of the County's stormwater management facilities is contained in the Stormwater Management Sub-Element.

Sea Level Rise

Since the completion of the SLR vulnerability assessment in 2012 that was described in the Existing Conditions section, Senate Bill 1094 was enacted, modifying Florida Statute section 163.3178(2)(f) to require, among other provisions, that local governments in Florida "include development and redevelopment principles, strategies, and engineering solutions that reduce the flood risk in coastal areas which results from high-tide events, storm surge, flash floods, stormwater runoff, and the related impacts of sea-level rise" within the coastal management elements of their comprehensive plans. In accordance with this legislation, and based on the best available data from the NOAA Coastal Service Center sea level projection models and best available local projected inundation data, County SLR inundation maps have been incorporated into this Coastal Management Element for planning purposes (Figures 9.16, 9.17, and 9.18).

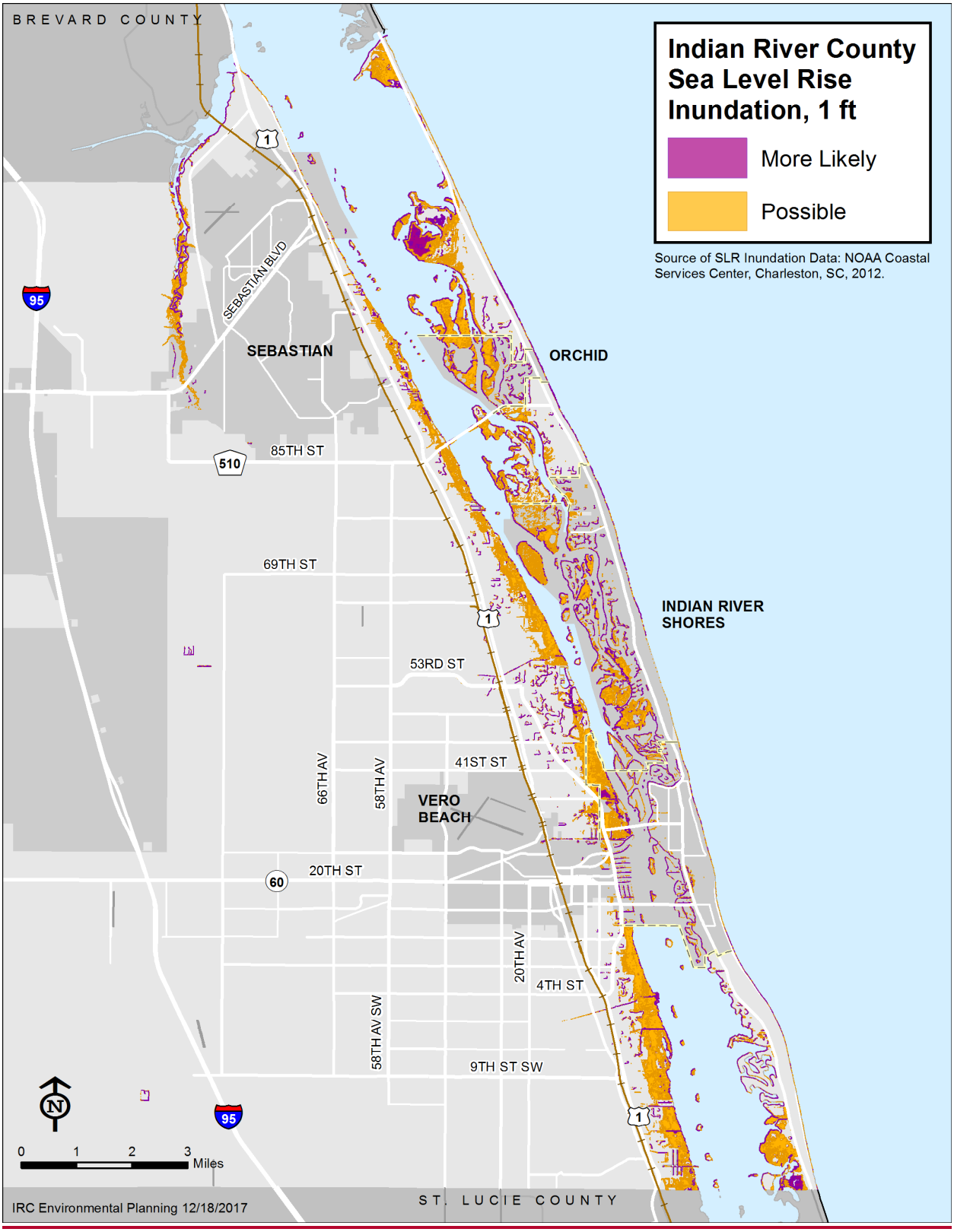

Figure 9.16: 1-Foot Sea Level Rise Scenario in Indian River County, FL

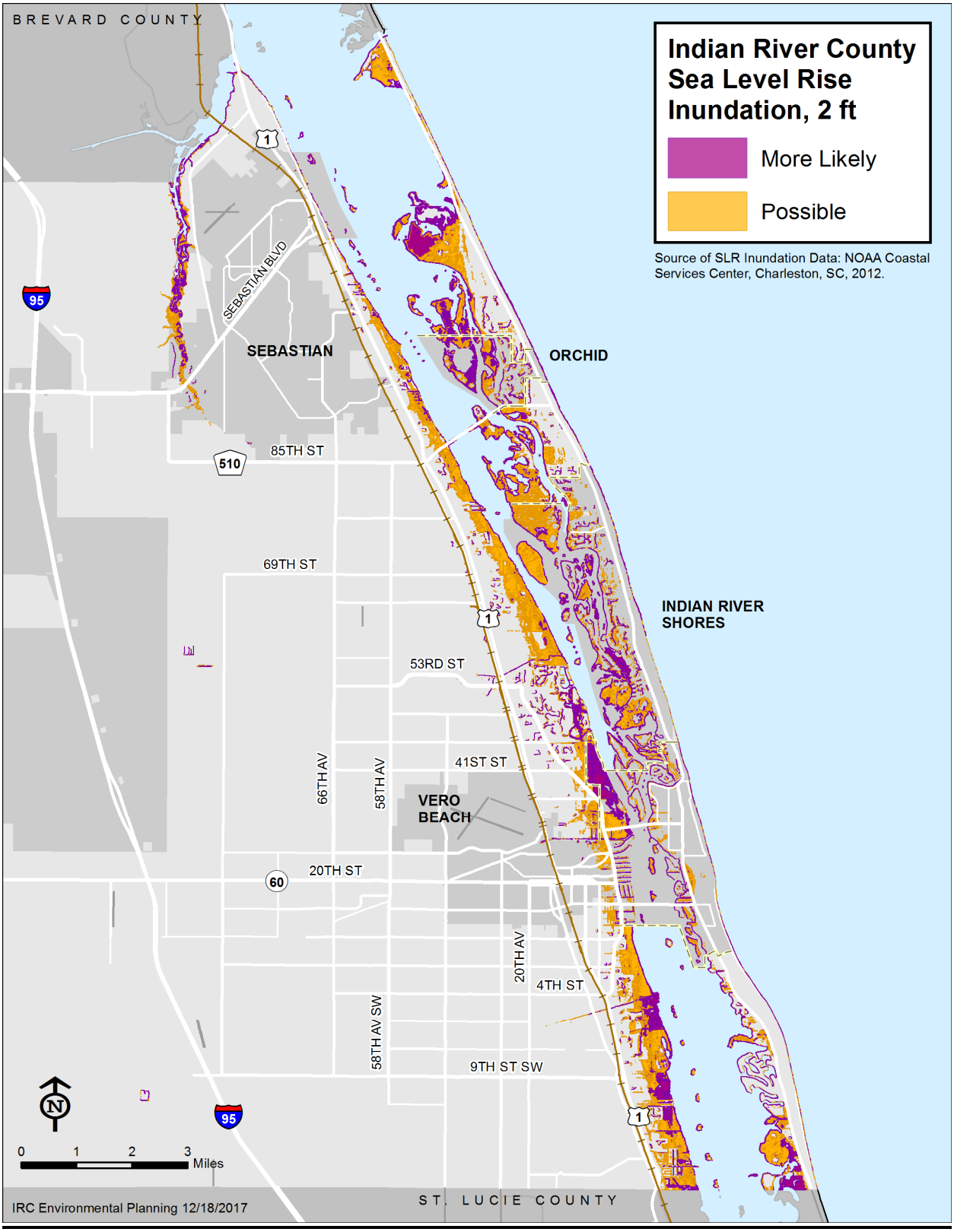

Figure 9.17: 2-Foot Sea Level Rise Scenario in Indian River County, FL

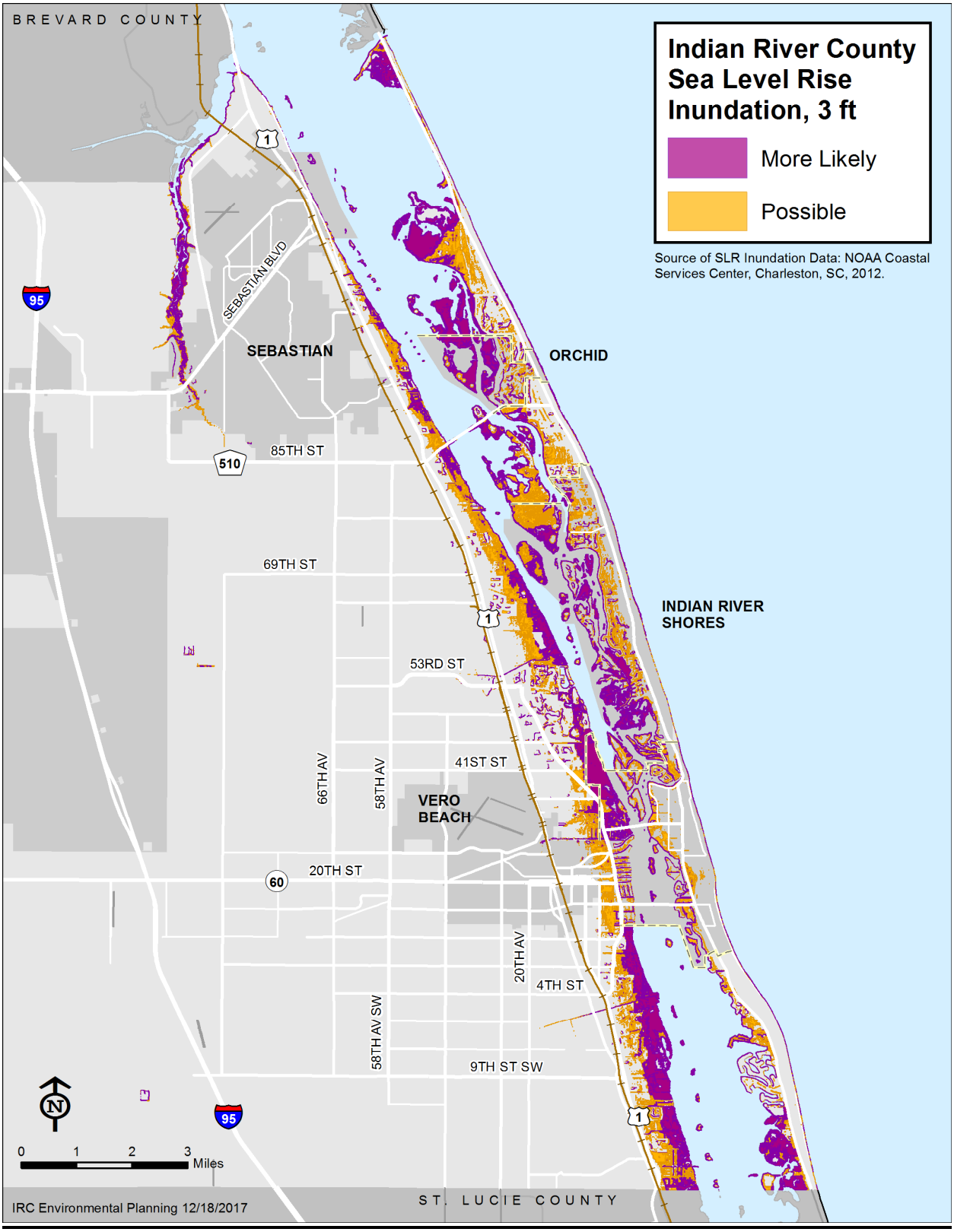

Figure 9.18: 3-Foot Sea Level Rise Scenario in Indian River County, FL

Table 9.4: Revised Sea Level Rise Inundation Estimates for Indian River County, Florida*

Probability Category	1ft Inundation Area (in Sq. Miles)	2ft Inundation Area (in Sq. Miles)	3ft Inundation Area (in Sq. Miles)
Possible	5.95	6.95	6.05
More Likely	0.90	2.84	6.54
Probability Category	**(Acres)**	**(Acres)**	**(Acres)**
Possible	3,809.97	4,447.07	3,871.39
More Likely	575.53	1,814.65	4,187.81

*Source: NOAA Coastal Services Center, Charleston, S.C., 2012, and Indian River County Environmental Planning, 2017. Note: The geographic areas within the probability categories "Possible" and "More Likely" do not overlap.

Inundation Risk by Land Use

The total land use area at risk from each SLR inundation scenario was analyzed. When evaluated based on total acres inundated, the data indicate that under all three inundation scenarios the greatest impacts of SLR are on lands designated Conservation and Recreation. Notably, privately owned estuarine wetlands and undeveloped lagoon island conservation areas appear to be the most vulnerable to SLR inundation impacts. It is estimated that more than 85% of currently existing coastal wetlands are at risk of inundation under the 3 foot sea level rise scenario.

Physical infrastructure such as roadways, power plants, ports and airports, landfills, hospitals and schools were determined to be critical facilities that were initially evaluated in the 2013 Seven50 report. Based on the best available data from the NOAA Coastal Service Center sea level projection models, risks to physical infrastructure at the one, two and three foot scenarios are described below.

- Indian River County has 4 airports east of I-95. No impacts were reported.
- FPL has seven parcels under the category of Electrical Power Substation. The City of Vero Beach has nine. No impacts were reported.
- FEC Railroad rights of way were assessed but did not show a vulnerability to sea level rise (no miles of track impacted).
- The water and wastewater treatment plant analysis included the Indian River Wastewater and Water Treatment facilities. Significant impacts may be encountered at facilities located along the Indian River Lagoon which incorporate coastal mosquito impoundments and estuarine marshes.
- Indian River County has 2 parcels under the data category of landfills. No impacts were reported.

- Hospital facilities are mainly concentrated in Vero Beach. Under the 2 and 3 foot scenarios approximately 6.8 and 16.5 acres of inundation, respectively, could be possible on the Indian River Medical Center parcel[1]. Impacts were to undeveloped portions of the parcel and no building infrastructure would be affected.

- The Indian River County Schools include five charter schools, eight public schools, 11 private schools and Indian River Community College. Fourteen total schools are designated as storm shelters. None of these were impacted at any scenario.

- Evacuation Routes to and from the barrier islands were not shown to be vulnerable to sea level rise at the three scenarios tested.

[1]Note: the currently undeveloped and unelevated east end of the overall IRMC parcel could be impacted under the scenarios tested.

Mitigation and adaptation strategies

Based on the analysis provided in this element, the majority of the inundation impacts are projected to occur within the Coastal High Hazard Area (CHHA); consequently, mitigation strategies that will likely have the greatest effect on reducing exposure to inundation risk due to one foot, two foot and three foot SLR scenarios involve reducing the potential population and vulnerable development within the CHHA. Therefore, the CHHA area should be used as an "Adaptation Action Area" (AAA) to implement strategies that address sea level rise impacts. Strategies that accomplish these objectives include reducing public infrastructure expenditures in at risk areas identified on the inundation maps, preventing or capping the number of assisted living facilities and similar special needs populations and higher density developments within the CHHA/AAA, and acquiring conservation and open space lands in the CHHA/AAA when feasible.

Future adaptation strategies may include relocation and/or elevation of critical infrastructure facilities and roadways where appropriate, incorporation of living shorelines that provide coastal resilience and carbon sequestration benefits, and improvements to stormwater conveyance systems that may be susceptible to failure as a result of rising groundwater and tide levels. Additionally, saltwater intrusion will be a growing concern based on the cumulative effects of projected potential SLR inundation and rising groundwater levels.

Policy 13.2: The county, in cooperation with the FWC, USFWS, FIND, and the ELC, will distribute manatee awareness and boating safety materials to local boaters at the time of yearly boat registration and other appropriate locations such as marinas, bait and tackle shops, and public parks.

Policy 13.3: By 2010, the county shall initiate a monofilament line recycling program by placing marked collection receptacles at boat ramps, marinas, bridges, and strategic locations.

Policy 13.4: All existing and new boat facilities (public and private) shall be required to post manatee awareness signs.

Policy 13.5: By 2010, all rental vessels, including personal watercraft, in Indian River County shall be required to display stickers or plasticized cards with boating safety and manatee protection information.

OBJECTIVE 14 Manatee Protection Measures

Through 2015, the annual number of manatee mortalities in Indian River County shall be no more than five (5), excluding unusual events such as red tide or disease outbreaks. Of these annual mortalities, no more than one (1) mortality shall be watercraft-related.

Policy 14.1: The county, in cooperation with the City of Vero Beach Utilities Department and the FWC Bureau of Protected Species Management will ensure that disruptions to outflow, and/or inadequate temperatures to sustain manatees during winter are minimized, and that all necessary precautions to minimize hazards at the power plant are initiated.

Policy 14.2: The county shall continue to assist the Indian River Mosquito Control District to identify and retrofit any remaining culverts or pipes that pose a threat of manatee entrapment.

OBJECTIVE 15 Sea Level Rise Adaptation Strategies

Through 2060, the County shall adopt, implement, and pursue strategies that increase community resiliency and protect property, infrastructure, and cultural and natural resources from the impacts of sea level rise.

Policy 15.1: By 2022, Public properties and infrastructure, including but not limited to water and wastewater facilities, stormwater systems, roads, bridges, governmental buildings, hospitals, coastal wetlands, transit infrastructure and other public assets that may be at risk to sea level rise impacts shall be identified. Based on risk inventory findings, resiliency improvements and relocation of infrastructure shall be considered as part of capital improvement plans, where warranted.

Policy 15.2: During major evaluations and overall updates to the comprehensive plan, the best available data and sea level rise projections such as those made by the United States Army Corps of Engineers, National Oceanic and Atmospheric Association, and the Southeast Florida

Regional Climate Change Compact, shall be taken into consideration when evaluating or updating policies related to sea level rise.

Policy 15.3: Beginning in 2022, and every 5 years thereafter, the County shall review the best available data on local sea level rise projections and County sea level rise inundation maps and shall update inundation maps and related analysis, as warranted.

Policy 15.4: The County shall coordinate with local municipalities regarding sea level rise adaptation and mitigation measures.

Policy 15.5: The County hereby adopts the Coastal High Hazard Area (CHHA) as an "Adaptation Action Area" (AAA) as defined in this Coastal Management Element to identify the geographic areas most vulnerable to the impacts of projected potential sea level rise and most appropriate for mitigation measures and resiliency improvements. Furthermore, the County shall apply this Element's Objective 5 CHHA policies to limit public infrastructure expenditures within the AAA.

Policy 15.6: By 2023, the County shall re-evaluate flood zone requirements and mitigation strategies within the AAA.

Policy 15.7: The County shall prohibit location within the AAA of new adult congregate living facilities, nursing homes, and other similar facilities that serve special needs populations.

Policy 15.8: No increase in land use designation density shall be approved by the County for properties that lie within the AAA.

PLAN IMPLEMENTATION

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

For the Coastal Management 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 9.4 identifies the type of action required, the entity or entities responsible for taking the action, the timing, and whether or not the policy necessitates a capital expenditure.

To implement the Coastal Management Element, several types of action must be taken. These include, but are not limited to: coordination with jurisdictional and reviewing agencies, establishing marina facilities siting criteria, and protecting/preserving estuarine resources.

Overall plan implementation responsibility will rest with the Community Development Department. Besides its responsibilities as identified in Table 9.4, the Community Development 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,

OBJECTIVE 17: COASTAL POPULATION

Through 2030, the county will have no increase in land use designation density or intensity within the Coastal High Hazard Area.

Policy 17.1: The county shall not approve plan amendments that increase the residential density or land use intensity within the Coastal High Hazard Area.

Policy 17.2: The county shall support programs of land acquisition on the barrier island for natural resource preservation, recreation or both.

Policy 17.3: The county shall limit densities in the coastal high hazard area to ensure timely evacuation of the barrier island.

Policy 17.4: The county shall prohibit new development of adult congregate living facilities, nursing homes, homes for the aged, total care facilities, and similar developments within the Coastal High Hazard Area.

Policy 17.5: The county hereby adopts the Coastal High Hazard Area boundary depicted on the county's Future Land Use Map. As set forth in Coastal Management Element Policy 15.5, the Coastal High Hazard Area is designated as an Adaptation Action Area (AAA) as defined in the Coastal Management Element, subject to the policies of this Objective 17 and of Coastal Management Element Objective 15 which include density and land use restrictions.

Appendix B