Volusia County Septic System Reduction Plan

1.0 Introduction

According to the Florida Department of Environmental Protection, septic systems, when properly designed, constructed and maintained, perform well in sparsely populated rural areas where large tracts of lands are available for wastewater disposal. However, in urban and coastal areas, septic systems can have a significant impact on resources, particularly in residential communities interspersed with tidal canals.

It is estimated there are approximately 90,000 individual on-site septic systems in Volusia County. Septic systems do not adequately remove nutrients such as nitrogen and phosphorus, which result in aquatic growth such as algal blooms in our waterways, which shade out marine vegetation and deplete fish life. Septic system effluent migrates from our yards into our waterways. It also seeps into the groundwater which can ultimately migrate to the Floridan Aquifer, resulting in high nutrients levels in our springs and drinking water supply.

Reducing the number of septic systems by connecting to a central sewer system will allow for advanced wastewater treatment at a County or municipal wastewater plant. Some county/municipal wastewater plants treat wastewater to public access reclaimed water standards, which allows for beneficial use of the wastewater effluent and reduces demands for potable water.

Volusia County has established a long term goal of eliminating all septic systems in areas where they are an inappropriate method of effluent disposal. Due to the costs of retrofitting these areas with central wastewater collection systems, the County must prioritize the elimination of septic systems. This plan focuses on elimination of septic systems near key water bodies such as the Mosquito Lagoon and Halifax River, located along the east coast of the county, the St. Johns River located along the west boundary of the county, and within the basins of significant springs such as Blue Spring and Gemini Spring located in southwest Volusia County.

2.0 Collection System Alternatives

There are three different alternatives for providing central sewer collection as follows:

Alternative 1 - Low pressure, small diameter sewer system with individually owned effluent pumps or grinder pumps
Alternative 2 - Conventional gravity sewer system
Alternative 3 - Vacuum sewer system

2.1 Alternative 1 - Low Pressure Small Diameter Sewer System

A low pressure small diameter sewer system consists of a small diameter (minimum 2 inches) force main that is typically installed within the road right-of-way (ROW). The system requires installing a septic tank effluent pump or a grinder pump at each residence to convey wastewater to the low pressure sewer system.

Advantages

- pipe sizes from 2 inches to 6 inches
- layout independent of topography
- reduced excavation compared to gravity
- sewer system infiltration greatly reduced
- eliminates manholes
- requires less power than vacuum system
- lower construction costs than other alternatives

Disadvantages

- effluent pump or grinder pump needed at each residence
- electrical power required
- air release valves needed
- flushing connections required
- periodic pumping of septic tank for effluent pump system
- power outage disturbs service

2.2 Alternative 2 - Conventional Gravity System

This alternative allows for gravity flow of wastewater to a central gravity sewer line located in the road right of way. The gravity collection systems flow to county or municipal wastewater pump station that pump wastewater to the wastewater treatment plant. Nearly all communities with central sewer service have gravity collection systems. Gravity systems have the highest construction cost but the lowest operational cost.

Advantages

- effluent or grinder pump <u>not</u> required at each residence
- lower operational cost compared to low pressure system or vacuum system
- most reliable collection system alternative

Disadvantages

- higher initial construction costs

2.3 Alternative 3 - Vacuum Sewer System

A vacuum sewer system utilizes a partial vacuum to transport sewage through the collection system. Vacuum sewer systems include a central vacuum station, which maintains the system at a sub-atmospheric pressure, with small diameter vacuum pipelines located in the road ROW. Service connections are made to each residence and a holding tank replaces the septic tank. A vacuum valve located in the holding tank allows rushing air from the service connection to transport the sewage to the central vacuum station. The central vacuum station operates 24-hours a day.

Advantages

- effluent or grinder pump not required at each residence
- reduced excavation compared to gravity sewer system
- grade and depth not critical

Disadvantages

- electrical power required at central vacuum station
- vacuum valves have a shorter life than pumps
- higher energy consumption than other alternatives
- major odor problem at central vacuum station
- vacuum loss will render the system non-operational, requiring immediate repair

2.4 Selected Alternative

Low pressure / effluent pump systems may be appropriate for rural or low density developments. For most urban, medium to high density applications, gravity collection systems are preferred by most communities. **The planning level costs provided in this plan are based on the use of Alternative 2 conventional gravity sewer collection.**

3.0 Planning Level Costs

For the purpose of this planning document, the design, permitting and construction costs for gravity sewer retrofit projects have been estimated based on the density of developments as follows:

High density: $15,000 per lot
Medium density: $20,000 per lot
Low density: $25,000 per lot

The primary elements of a gravity sewer retrofit project are:

- Installation of gravity sewer piping and manholes
- Acquisition of land for utility owned pump stations
- Installation of utility owned pump stations and force mains
- Dewatering as needed and proper disposal of water
- Installation/replacement of water distribution system as required
- Rebuild and pave roadways
- Maintenance of traffic
- Survey, engineering design and permitting

Additional costs for connection to central sewer include the following on a per lot basis:

- Impact fee for sewer: $2,900
- Septic tank/drain field abandonment: $1,000
- Connection of home sewer plumbing to central sewer: $1,100

Estimated Total = $5,000

Many residential developments with individual on-site septic systems also have individual on-site wells for water service. Additional costs for connection to the central water system include the following on a per lot basis:

- Impact fee for potable water: $1,500
- Connection of home plumbing to central water: $ 500

Estimated Total = $2,000

3.1 Design, Permitting and Construction Time Frames

The time frame required to complete design, permitting and construction of a gravity sewer retrofit project via the design-bid-build procurement process is approximately 3 to 4 years depending on the size of the project. The primary components of the design-bid-build procurement process are as follows:

- Advertisement of a Request for Statement of Qualifications (RSQ) for engineering design and permitting services, bidding assistance and construction phase services
- Establishment of a selection committee for review of RSQ's
- Short listing and selection of an engineering consulting firm by the selection committee
- County Council approval of an engineering consulting firm
- Issuance of a Notice To Proceed to the Council approved engineering consulting firm
- Completion of survey, geotechnical services, engineering design and permitting, preparation of construction bid documents by the engineering consulting firm
- Advertisement of bid documents
- Construction bid opening
- Review of bids by the engineering consulting firm
- County Council award of a construction contract to the responsive and responsible low bidder
- Notice to Proceed issued to the low bidder
- Construction
- Construction closeout

The time needed for project initiation through issuance of the Notice To Proceed with construction should be approximately 24 to 26 months, regardless of project size. The time needed to complete construction may vary from 16 months to 24 months depending on the project size. A typical project timeline for a gravity sewer retrofit construction project is depicted Figure 3.1-1 below. This timeline assumes that all necessary rights of way / easements exist, that land acquisition is not required.

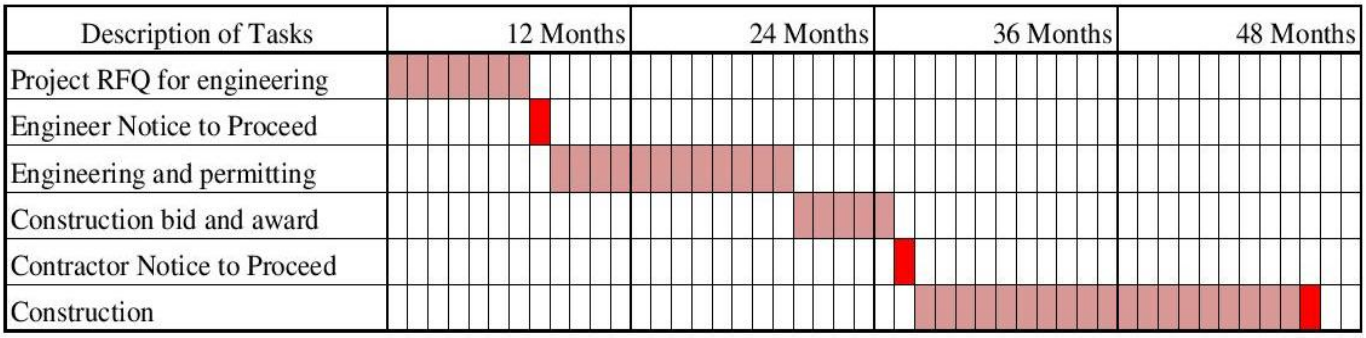

Figure 3.1-1

4.0 Priority Areas for Central Sewer Retrofit

This plan prioritizes the following four (4) water bodies for elimination of septic systems:

- Mosquito Lagoon Watershed
- Halifax River Watershed
- Blue Spring Basin
- Gemini Springs Basin

4.1 The **Mosquito Lagoon Watershed**, located in Southeast Volusia County, north of and connected to the Indian River Lagoon, is an Outstanding Florida Water. Much of the existing development along the US Highway 1 corridor south of Edgewater receives sewer service via individual on-site septic systems. In recent years, Mosquito Lagoon and the Indian River Lagoon have experienced algal blooms that have resulted in a decline of aquatic grass beds, fish kills and higher than normal dolphin and Manatee deaths. Abnormally high nutrient loads to the lagoon, from both direct and indirect discharges, are believed to be contributing to the algal blooms. Effluent from septic systems located in the Mosquito Lagoon watershed is a significant contributor to the nutrient overloading.

Figure 4.1-1 depicts the developments in Southeast Volusia, within the Mosquito Lagoon Watershed, that are priority areas for elimination of septic systems, and how the developments could potentially be broken out into sub-areas for incremental completion as cost share grant funding becomes available. The sub-areas have been established based on each development's location relative to the lagoon and/or tidal canals that discharge to the lagoon. The highest priority has been given to those developments located east of US Highway 1, adjacent to the lagoon, with tidal canals connected to the lagoon. Wastewater flows from these areas would be pumped to Volusia County's Southeast Regional Water Reclamation Facility for treatment.

The following is a description of each of the priority areas identified in Figure 4.1-1:

Area 1
Indian Harbor Estates
This area contains approximately 304 lots. It is bounded by Indian Creek Road, US Highway 1, Ariel Road and the Mosquito Lagoon. The development is characterized as high density. The majority of lots in the development are located on canals that lead to Mosquito Lagoon. The area receives potable water service from Volusia County. Due to its high density and location relative to canals leading directly to the lagoon, it is ranked as top priority for retrofit with a central sewer collection system. The planning level costs to retrofit the area with central sewer are as follows:

Construction:	$4.15 million
Engineering:	$0.41 million
Subtotal, public improvements:	$4.56 million ($15,000/parcel)
Sewer impact fee and on-site improvements:	$1.52 million ($5,000/parcel)
Total:	**$6.08 million** ($20,000/parcel)

Cory Estates (Edgewater) Area 4

Waterway Estates (Edgewater) Area 3

Jones Fish Camp Area 7

Waterfront Park Area 5

Indian Harbor Estates Area 1

Lyon Subdivision Area 6

Area 2
Jackson Hole RV Park
Mosquito Lagoon RV Park
and Seminole Rest State
Park

Jackson Hole RV Park

Mobile Village Area 9

Seminole Rest State Park

Mosquito Lagoon RV Park

Oak Hill West Area 10

Oak Hill East Area 8

Legend

- Lift Station
- Sewer Plant
- Manholes
- Gravity Mains
- Force Mains

Indian Harbor Estates
- IHE Area 1

Seminole Rest State Park
- SRSP Area 2

Jackson Hole RV Park
- LFC Area 2

Mosquito Lagoon RV Park
- MLRVP Area 2

Waterway Park
- WE Area 3

Cory Estates
- CE Area 4

Water Front
- WF Area 5

Lyon Subdivision
- LS Area 6

Mobile Village
- MV Area 7

Oak Hill East
- OHE Area 8

Jones Fish Camp
- JFC Area 9

Oak Hill West
- OHW Area 10
- Parcel

Southeast Volusia
Mosquito Lagoon Watershed
Septic Tank Elimination Plan

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Prepared by: Volusia County Public Works/RJ Date: 9/24/2014
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Figure 4.1-1

Area 2
Jackson Hole RV Park,
Mosquito Lagoon RV Park and Seminole Rest State Park

The area described as Jackson Hole RV Park is located on the east side of River Road, at its intersection with Canal Street, adjacent to the Mosquito Lagoon. The area is characterized by high density with a mixture of single family homes and RV/trailer sites. The development receives water service via a privately owned well(s) although central water service is available. Due to its high density and location relative to the Mosquito Lagoon, it is ranked high for retrofit with a central sewer collection system.

The area described as Mosquito Lagoon RV Park is located on the east side of River Road, at the east end of Halifax Avenue. It is on a peninsula that extends into Mosquito Lagoon. The area is characterized as high density with a mixture of single family homes and RV/trailer sites. The development receives water service via a privately owned well(s). Sewer service is provided by approximately 25 on-site septic systems. Due to its high density and location relative to the Mosquito Lagoon, it is ranked high for retrofit with a central sewer collection system.

Seminole Rest State Park is located on the east side of River Road, adjacent to Mosquito Lagoon, halfway between Canal Street and Halifax Avenue. The park receives water service via the county's potable water system.

The planning level costs to retrofit the area are as follows:

Sewer

Construction:	$1.27 million
Engineering:	$0.13 million
Subtotal, public improvements:	$1.40 million
Sewer impact fees and on-site improvements:	$0.70 million
Total:	**$2.10 million**

Water Service to Mosquito Lagoon RV Park

Construction:	$0.20 million
Engineering:	$0.02 million
Subtotal, public improvements:	$0.22 million
Water impact fees and on-site improvements:	$0.20 million
Total:	**$0.42 million**

Area 3
Waterway Estates
This area contains approximately 240 lots. It is bounded by Poinciana Road, Godfrey Road, US Highway 1 and the Mosquito Lagoon. The development is characterized as medium density. The majority of lots in the development are located on canals that lead to Mosquito Lagoon. The area receives potable water service from the City of Edgewater. Due to its medium density and location relative to canals leading directly to the lagoon, it is ranked as high priority for retrofit with a central sewer collection system.

The planning level costs to retrofit the area with central sewer are as follows:

Construction:	$4.38 million
Engineering:	$0.44 million
Subtotal, public improvements:	$4.82 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$1.21 million ($5,000/parcel)
Total:	**$6.03 million** ($25,000/parcel)

Area 4
Cory Estates
This area contains approximately 180 lots. It is bounded by North Cory Drive, Arbor Lane, US Highway 1 and the Mosquito Lagoon. The development is characterized as medium density. Approximately one third of homes in the development are located on a canal that leads to Mosquito Lagoon. The area receives potable water service from the City of Edgewater. Due to its medium density and location relative to a canal leading directly to the lagoon, it is ranked as high priority for retrofit with a central sewer collection system.

The planning level costs to retrofit the area with central sewer are as follows:

Construction:	$3.42 million
Engineering:	$0.34 million
Subtotal, public improvements:	$3.76 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$0.94 million ($5,000/parcel)
Total:	**$4.70 million** ($25,000/parcel)

Area 5
Waterfront Park
This area contains approximately 40 lots. The lots are located along William Street and Myrtle Street, between US Highway 1 and the Mosquito Lagoon. The development is characterized as low density. Approximately one quarter of homes in the development are located adjacent to Mosquito Lagoon. The area receives potable water service from Volusia County. Due to its location east of US Highway 1, adjacent to the Mosquito Lagoon, it is ranked as medium priority for retrofit with a central sewer collection system.

The planning level costs to retrofit the area with central sewer are as follows:

Construction:	$0.91 million
Engineering:	$0.09 million
Subtotal, public improvements:	$1.00 million ($25,000/parcel)
Sewer impact fee and on-site improvements:	$0.20 million ($5,000/parcel)
Total:	**$1.20 million** ($30,000/parcel)

Area 6
Lyon Subdivision
This area contains approximately 47 lots. The lots are located along Barberry Drive, Eaglewatch Road and HH Birch Road, between US Highway 1 and the Mosquito Lagoon. The development is characterized as low density. Approximately one half of homes in the development receive potable water service from Volusia County. Due to its location east of US Highway 1, near the Mosquito Lagoon, it is ranked as medium priority for retrofit with a central sewer collection system.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$1.07 million
Engineering:	$0.11 million
Subtotal, public improvements:	$1.18 million ($25,000/parcel)
Sewer impact fee and on-site improvements:	$0.24 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.05 million ($2,000/parcel)
Total:	**$1.47 million** ($30,000 to 32,000/parcel)

Area 7
Jones Fish Camp
This area contains approximately 66 lots. The lots are located along Jones Fish Camp Road and Alice Street, between US Highway 1 and the Mosquito Lagoon. The development is characterized as low density. Water service is provided by individual, on-site wells. Due to its location east of US Highway 1, near the Mosquito Lagoon, it is ranked as medium priority for retrofit with a central sewer collection system.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$1.50 million
Engineering:	$0.15 million
Subtotal, public improvements:	$1.65 million ($25,000/parcel)
Sewer impact fee and on-site improvements:	$0.33 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.13 million ($2,000/parcel)
Total:	**$2.11 million** ($32,000/parcel)

Area 8
Oak Hill East
This area contains approximately 230 lots. It is bounded by Lagoon Avenue/Palm Avenue, East Church Street, US Highway 1 and the Mosquito Lagoon. The development is characterized as medium density. Water service is provided by individual, on-site wells. Due to its location east of US Highway 1, near the Mosquito Lagoon, it is ranked as medium priority for retrofit with a central sewer collection system.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$4.16 million
Engineering:	$0.42 million
Subtotal, public improvements:	$4.58 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$1.15 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.46 million ($2,000/parcel)
Total:	**$6.19 million** ($27,000/parcel)

Area 9
Mobile Village
This area contains approximately 175 lots. It is bounded by North Second Street, South Street, West Loop Road and US Highway 1. The development is characterized as medium density. Water service is provided by individual, on-site wells. Because of its medium density and location west of US Highway 1, it ranks as low priority for retrofit with a central sewer collection system.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$3.18 million
Engineering:	$0.32 million
Subtotal, public improvements:	$3.50 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$0.88 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.35 million ($2,000/parcel)
Total:	**$4.73 million** ($27,000/parcel)

Area 10
Oak Hill West
This area contains approximately 170 lots. It is bounded by West Halifax Avenue, Hickory Avenue, Wyatt Street and US Highway 1. The development is characterized as medium density. Water service is provided by individual, on-site wells. Because of its medium density and location west of US Highway 1, it ranks as low priority for retrofit with a central sewer collection system.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$3.09 million
Engineering:	$0.31 million
Subtotal, public improvements:	$3.40 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$0.85 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.34 million ($2,000/parcel)
Total:	**$4.59 million** ($27,000/parcel)

The total planning level cost to retrofit the identified areas within the Mosquito Lagoon Watershed with central sewer is estimated at $49 million.

4.2 The **Halifax River Watershed** covers the remaining coast line of Volusia County north of the Mosquito Lagoon Watershed, from the New Smyrna Beach area north to the county line. The Halifax River Watershed is one of the most urbanized watersheds in Volusia County. Although most of the area is served by central sewer, there are pockets of older development in the watershed that are served by individual septic systems. One of the most significant of these areas is the north peninsula, north of the city limits of Ormond Beach where there are approximately 5,000 high density residences located on the relatively narrow peninsula between the Halifax River and the Atlantic Ocean. Due to poor tidal flushing, water quality is poor in this portion of the Halifax River.

Figure 4.2-1 depicts developments in the unincorporated area of the North Peninsula that have been identified for elimination of septic systems, and how these developments could potentially be broken into projects for incremental completion as cost share grant funding becomes available.

The following is a description of each of the priority areas identified in Figure 4.2-1 along with planning level costs to retrofit each area with central sewer:

Area 1
River Breeze Estates
This area contains approximately 1,010 lots. It is bounded by Plaza Drive, Longwood Drive, John Anderson Drive and A1A. The development is characterized as high density. Potable water service is provided by City of Ormond Beach.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$13.77 million
Engineering:	$1.38 million
Subtotal, public improvements:	$15.15 million ($15,000/parcel)
Sewer impact fee and on-site improvements:	$5.05 million ($5,000/parcel)
Total:	**$20.20 million** ($20,000/parcel)

Area 2
Sunny Shores
This area contains approximately 780 lots. It is bounded by Hibiscus Drive, Seaside Drive, John Anderson Drive and A1A. The development is characterized as high density. Potable water service is provided by City of Ormond Beach.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$10.64 million
Engineering:	$1.06 million
Subtotal, public improvements:	$11.70 million ($15,000/parcel)
Sewer impact fee and on-site improvements:	$3.90 million ($5,000/parcel)
Total:	**$15.60 million** ($20,000/parcel)

Northeast Volusia
Halifax River Watershed
Septic Tank Elimination Plan

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Ormond Beach Plaza Area 9

Fairwinds Area 8

Avalon by the Sea Area 7

Imperial Heights Area 6

Ormond Shores Estates Area 5

Aqua Vista Circles Area 4

Roberta Heights Area 3

Sunny Shores Area 2

River Breeze Estates Area 1

Legend

- Lift Station
- Sewer Plant
- Manholes
- Gravity Mains
- Force Mains
- Ormond Beach Plaza Area 9
- Fairwinds Area 8
- Avalon by the Sea Area 7
- Imperial Heights Area 6
- Ormond Shores Estates Area 5
- Aqua Vista Circles Area 4
- Roberta Heights Area 3
- Sunny Shores Area 2
- River Breeze Estates Area 1
- Parcel

Figure 4.2-1

Area 3
Roberta Heights
This area contains approximately 860 lots. It is bounded by Rivershore Drive, Rivocean Drive, John Anderson Drive and A1A. The development is characterized as high density. Potable water service is provided by City of Ormond Beach.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$11.73 million
Engineering:	$1.17 million
Subtotal, public improvements:	$12.90 million ($15,000/parcel)
Sewer impact fee and on-site improvements:	$4.30 million ($5,000/parcel)
Total:	**$17.20 million** ($20,000/parcel)

Area 4
Aqua Vista
This area contains approximately 470 lots. It is bounded by Sandra Drive, Marden Drive, John Anderson Drive and A1A. The development is characterized as high density. Potable water service is provided by City of Ormond Beach.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$6.41 million
Engineering:	$0.64 million
Subtotal, public improvements:	$7.05 million ($15,000/parcel)
Sewer impact fee and on-site improvements:	$2.35 million ($5,000/parcel)
Total:	**$9.40 million** ($20,000/parcel)

Area 5
Ormond Shores Estates
This area contains approximately 700 lots. It is bounded by Starlight Drive, San Jose Circle, John Anderson Drive and A1A. The development is characterized as high density. Potable water service is provided by City of Ormond Beach.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$9.55 million
Engineering:	$0.95 million
Subtotal, public improvements:	$10.50 million ($15,000/parcel)
Sewer impact fee and on-site improvements:	$3.50 million ($5,000/parcel)
Total:	**$14.0 million** ($20,000/parcel)

Area 6
Imperial Heights
This area contains approximately 340 lots. It is bounded by Island Cay Drive, Pierside Drive, John Anderson Drive and A1A. The development is characterized as high density. Potable water service is provided by City of Ormond Beach.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$4.64 million
Engineering:	$0.46 million
Subtotal, public improvements:	$5.10 million ($15,000/parcel)
Sewer impact fee and on-site improvements:	$1.70 million ($5,000/parcel)
Total:	**$6.80 million** ($20,000/parcel)

Area 7
Avalon By The Sea
This area contains approximately 490 lots. It is bounded by Ocean Grove Drive, Via Madrid Drive, John Anderson Drive and A1A. The development is characterized as high density. Potable water service is provided by City of Ormond Beach.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$6.68 million
Engineering:	$0.67 million
Subtotal, public improvements:	$7.35 million ($15,000/parcel)
Sewer impact fee and on-site improvements:	$2.45 million ($5,000/parcel)
Total:	**$9.80 million** ($20,000/parcel)

Area 8
Fairwinds
This area contains approximately 190 lots. It is bounded by Capistrano Drive, North Ocean Aire Terrace, John Anderson Drive and A1A. The development is characterized as high density. Potable water service is provided by City of Ormond Beach.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$2.59 million
Engineering:	$0.26 million
Subtotal, public improvements:	$2.85 million ($15,000/parcel)
Sewer impact fee and on-site improvements:	$0.95 million ($5,000/parcel)
Total:	**$3.80 million** ($20,000/parcel)

Area 9
Ormond Beach Plaza
This area contains approximately 110 lots. It is bounded by Dolphin Avenue, Tarpon Avenue, John Anderson Drive and A1A. The development is characterized as high density. Potable water service is provided by City of Ormond Beach.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$1.50 million
Engineering:	$0.15 million
Subtotal, public improvements:	$1.65 million ($15,000/parcel)
Sewer impact fee and on-site improvements:	$0.55 million ($5,000/parcel)
Total:	**$2.20 million** ($20,000/parcel)

The total planning level cost to retrofit the identified areas within the Halifax River Watershed with central sewer is estimated at $99 million.

4.3 The **Blue Spring Basin** is the groundwater/drainage basin that contributes to water flow in Blue Spring, a first magnitude spring located along the St. Johns River, west of Orange City. The Blue Spring Basin, as established by the St. Johns River Water Management District, is identified on Figure 4.3-1.

A Total Maximum Daily Load (TMDL) has been established by the Florida Dept. of Environmental Protection (FDEP) for excess nutrients in Blue Spring and the Blue Spring run. A significant contributor of nutrients to Blue Spring is septic systems located within the spring basin.

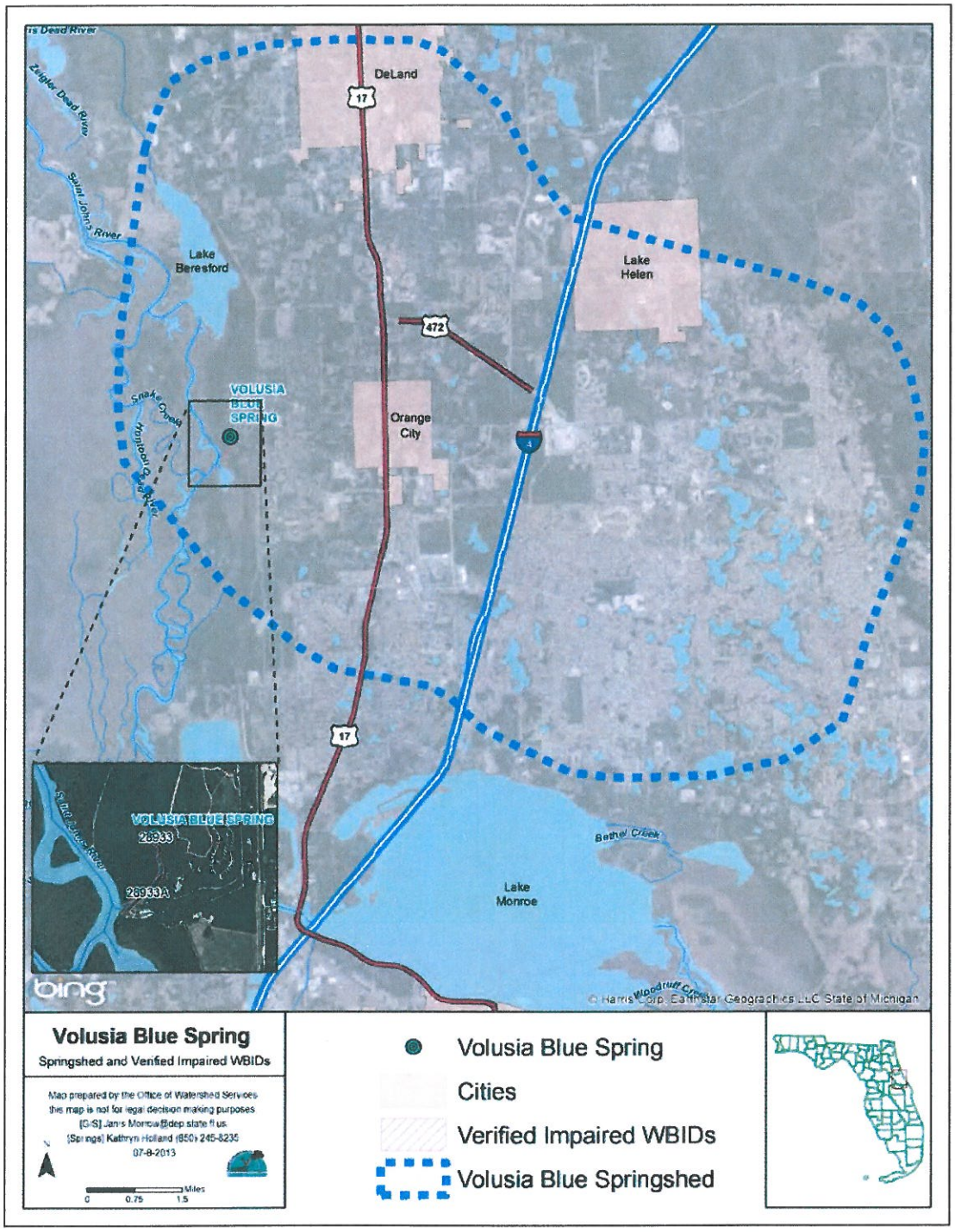
Figure 4.3-2 depicts the developments in Southwest Volusia, within Volusia County's utility service area, that have been identified for elimination of septic systems. Due to the high costs associated with central sewer retrofit, the developments have been broken out into projects to take advantage of state and/or of federal funding as it becomes available. The project areas are numbered based on their proximity to Blue Spring. There are several developments on the map with relatively large (one acre or greater) lots that are not a high priority for central sewer retrofit in this plan.

The following is a description of each of the priority areas identified in Figure 4.3-2 along with planning level costs to retrofit each area with central sewer:

Area 1
Orange City Terrace
This area contains approximately 610 lots. It is bounded by Fern Street, Shirley Street, Live Oak Avenue, and the FEC Railroad to the west. The development is characterized as medium density. Water service is provided by individual, on-site wells. The development is located within the Blue Spring Basin.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$11.09 million
Engineering:	$1.11 million
Subtotal, public improvements:	$12.20 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$3.05 million ($5,000/parcel)
Water impact fee and on-site improvements:	$1.22 million ($2,000/parcel)
Total:	**$16.47 million** ($27,000/parcel)



Springshed for Blue Spring and Blue Spring Run (SJRWMD)

Southwest Volusia
Blue Springs Basin
Septic Tank Elimination Plan

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West Highlands Area 4

West Highlands Area 5

West Highlands Area 3

St Johns River

Orange City Terrace Area 1

Blue Springs

Orange City Terrace Area 2

Orange City Hills Area 6

Orange City Hills Area 7

Breezewood Area 8

Legend

- LS Lift Station
- STP Sewer Plant
- Manholes
- Gravity Mains
- Force Mains
- Service Area

Breezewood Park Area
- BW Area 8

Orange City Hills Area
- OCH Area 6
- OCH Area 7

Orange City Terrace Area
- OCT Area 1
- OCT Area 2

West Highlands Area
- WH Area 3
- WH Area 4
- WH Area 5
- Parcel

Figure 4.3-2

Area 2
Orange City Terrace
This area contains approximately 540 lots. It is bounded by Shirley Street, Adeline Street, Division Avenue, and South Cedar Avenue. The development is characterized as medium density. Water service is provided by individual, on-site wells. The development is located within the Blue Spring Basin.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$9.82 million
Engineering:	$0.98 million
Subtotal, public improvements:	$10.80 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$2.70 million ($5,000/parcel)
Water impact fee and on-site improvements:	$1.08 million ($2,000/parcel)
Total:	**$14.58 million** ($27,000/parcel)

Area 3
West Highlands
This area contains approximately 490 lots. It is bounded by West New York Avenue, 1st Street, Hamilton Avenue, and Bishop Avenue. The development is characterized as medium density. Water service is provided by individual, on-site wells. The development is located within the Blue Spring Basin.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$8.91 million
Engineering:	$0.89 million
Subtotal, public improvements:	$9.80 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$2.45 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.98 million ($2,000/parcel)
Total:	**$13.23 million** ($27,000/parcel)

Area 4
West Highlands
This area contains approximately 500 lots. It is bounded by 20th Street, Brown Avenue, Bishop Avenue, and the FEC Railroad to the west. The development is characterized as medium density. Water service is provided by individual, on-site wells. The development is located within the Blue Spring Basin.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$9.09 million
Engineering:	$0.91 million
Subtotal, public improvements:	$10.00 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$2.50 million ($5,000/parcel)
Water impact fee and on-site improvements:	$1.00 million ($2,000/parcel)
Total:	**$13.50 million** ($27,000/parcel)

Area 5
West Highlands
This area contains approximately 450 lots. It is bounded by West Minnesota Avenue, West New York Avenue, Hamilton Avenue and Bishop Avenue. The development is characterized as medium density. Water service is provided by individual, on-site wells. The development is located within the Blue Spring Basin.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$8.18 million
Engineering:	$0.82 million
Subtotal, public improvements:	$9.00 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$2.25 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.90 million ($2,000/parcel)
Total:	**$12.15 million** ($27,000/parcel)

Area 6
Orange City Hills
This area contains approximately 150 lots. It is bounded by Sparkman Avenue, University High School on the north and west sides, and vacant property to the south. The development is characterized as medium density. Potable water service is provided by Volusia County. The development is located within the Blue Spring Basin.

The planning level costs to retrofit the area with central sewer are as follows:

Construction:	$2.72 million
Engineering:	$0.27 million
Subtotal, public improvements:	$3.00 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$0.75 million ($5,000/parcel)
Total:	**$3.75 million** ($25,000/parcel)

Area 7
Orange City Hills
This area contains approximately 400 lots. It is bounded by South Sparkman Avenue, US Hwy 17/92, West Rhode Island Avenue and undeveloped land to the south. The development is characterized as medium density. Approximately one half of the development receives potable water service from Volusia County, and the remaining parcels receive water service by individual, on-site wells. The development is located within the Blue Spring Basin.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$7.27 million
Engineering:	$0.73 million
Subtotal, public improvements:	$8.00 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$2.00 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.40 million ($2,000/parcel, ½ of parcels)
Total:	**$10.40 million** ($25,000 to 27,000/parcel)

Area 8
Breezewood
This area contains approximately 450 lots. It is bounded by US Hwy 17/92, Junior Street, East Roberts Street and East Elm Drive. The development is characterized as medium density. Potable water service is provided by Volusia County. The development is located within the Blue Spring Basin.

The planning level costs to retrofit the area with central sewer are as follows:

Construction:	$8.18 million
Engineering:	$0.82 million
Subtotal, public improvements:	$9.00 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$2.25 million ($5,000/parcel)
Total:	**$11.25 million** ($25,000/parcel)

The total planning level cost to retrofit the identified areas within the Blue Spring Basin with central water and sewer is estimated at $95 million.

4.4 The **Gemini Springs Basin** is the groundwater/drainage basin that contributes to water flow in Gemini Springs, a second magnitude spring located south of Dirksen Drive, east of 17/92 and west of I-4 in the City of DeBary. Gemini Springs discharges to the DeBary Bayou, which empties into Lake Monroe, a water body along the along the St. Johns River. A significant contributor of nutrients to Gemini Springs is septic systems located within the spring basin.

Figure 4.4-1 depicts the developments in the Gemini Springs Basin, within Volusia County's utility service area, that have been identified for elimination of septic systems. Due to the high costs associated with central sewer retrofit, the developments have been broken out into projects to take advantage of state and/or of federal funding as it becomes available. The project areas are numbered based on their proximity to Gemini Springs. There are several developments on the map with relatively large (one acre or greater) lots that are not a high priority for central sewer retrofit in this plan.

The following is a description of each of the priority areas identified in Figure 4.4-1 along with planning level costs to retrofit each area with central sewer and water (where currently not available):

Area 1
Plantation Estates
This area contains approximately 480 lots. It is bounded by Plantation Road, Dirksen Drive, Buena Vista Street, and Margarita Road. The development is characterized as medium density. Water service is provided by individual, on-site wells. The development is located relatively close to Gemini Springs.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$8.73 million
Engineering:	$0.87 million
Subtotal, public improvements:	$9.60 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$2.40 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.96 million ($2,000/parcel)
Total:	**$12.96 million** ($27,000/parcel)

Southwest Volusia
Gemini Springs Basin
Septic Tank Elimination Plan

Volusia County
FLORIDA

Prepared by: Volusia County Public Works/RJ Date: 9/24/2014
File: G:/OnGoing/WaterUtil//Septic/SouthwestNorthParcels_11x17_092314.mxd

St. Johns River

St. Johns River Estates Area 11

DeBary Plantation/Surrey Run Area 10

Lake Marie Estates Area 9

Lake Marie Estates Phase 8

Florida Power and Light Cooling Pond

Lake Marie Estates Area 7

Plantation Estates Area 1

Gemini Springs

Plantation Estates Area 2

Plantation Estates Area 3

Plantation Estates Area 4

Plantation Estates Area 5

Plantation Estates Area 6

Summerhaven Area 12

Legend

- Lift Station
- Sewer Plant
- Manholes
- Gravity Mains
- Force Mains

Plantation Estates Area
- PEA Area 1
- PEA Area 2
- PEA Area 3
- PEA Area 4
- PEA Area 5
- PEA Area 6

Lake Marie Area
- LM Area 7
- LM Area 8
- LM Area 9

Debary Plantation
- DP Area 10

St. Johns River Estates
- SJR Area 11

Summerhaven
- SH Area 12
- Service Area
- Parcel

Figure 4.4-1

Area 2
Plantation Estates
This area contains approximately 405 lots. It is bounded by Angeles Road, Plantation Road, US Hwy 17/92 and Matanzas Road. The development is characterized as medium density. Water service is provided by individual, on-site wells. The development is located relatively close to Gemini Springs.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$7.36 million
Engineering:	$0.74 million
Subtotal, public improvements:	$8.10 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$2.03 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.81 million ($2,000/parcel)
Total:	**$10.94 million** ($27,000/parcel)

Area 3
Plantation Estates
This area contains approximately 360 lots. It is bounded by Valencia Road, Dirksen Drive, Margarita Road and Palm Road. The development is characterized as medium density. Water service is provided by individual, on-site wells. The development is located relatively close to Gemini Springs.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$6.55 million
Engineering:	$0.65 million
Subtotal, public improvements:	$7.20 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$1.80 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.72 million ($2,000/parcel)
Total:	**$9.72 million** ($27,000/parcel)

Area 4
Plantation Estates
This area contains approximately 350 lots. It is bounded by Valencia Road, DeLeon Road, Bonita Road and Interstate 4. The development is characterized as medium density. Water service is provided by individual, on-site wells. The development is located relatively close to Gemini Springs.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$6.36 million
Engineering:	$0.64 million
Subtotal, public improvements:	$7.00 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$1.75 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.70 million ($2,000/parcel)
Total:	**$9.45 million** ($27,000/parcel)

Area 5
Plantation Estates
This area contains approximately 580 lots. It is bounded by Columba Road, East Highbanks Road, US Hwy 17/92 and Amigos Road. The development is characterized as medium density. Water service is provided by individual, on-site wells.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$10.55 million
Engineering:	$1.05 million
Subtotal, public improvements:	$11.60 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$2.90 million ($5,000/parcel)
Water impact fee and on-site improvements:	$1.16 million ($2,000/parcel)
Total:	**$15.66 million** ($27,000/parcel)

Area 6
Plantation Estates
This area contains approximately 460 lots. It is bounded by, DeLeon Road, East Highbanks Road, Amigos Road and Bass Lake Drive. The development is characterized as medium density. Approximately one half of the parcels have central water service. The remaining parcels receive water service by individual, on-site wells.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$8.36 million
Engineering:	$0.84 million
Subtotal, public improvements:	$9.20 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$2.30 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.46 million ($2,000/parcel, ½ parcels)
Total:	**$11.96 million** ($25,000 to 27,000/parcel)

Area 7
Miller Acres
This area contains approximately 380 lots. It is bounded by Sanford Avenue, Lake Drive, Pinedale Road and US Hwy 17/92. The development is characterized as medium density. Water service is provided by individual, on-site wells.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$6.91 million
Engineering:	$0.69 million
Subtotal, public improvements:	$7.60 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$1.90 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.76 million ($2,000/parcel)
Total:	**$10.26 million** ($27,000/parcel)

Area 8
Lake Marie Estates
This area contains approximately 390 lots. It is bounded by Lake Drive, West Highbanks Road, Pinedale Road and US Hwy 17/92. The development is characterized as medium density. Water service is provided by individual, on-site wells.

The planning level costs to retrofit the area with central sewer and water are as follows:

Construction:	$7.09 million
Engineering:	$0.71 million
Subtotal, public improvements:	$7.80 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$1.95 million ($5,000/parcel)
Water impact fee and on-site improvements:	$0.78 million ($2,000/parcel)
Total:	**$10.53 million** ($27,000/parcel)

Area 9
Lake Marie Estates
This area contains approximately 410 lots. It is bounded by West Highbanks Road, Dogwood Trail, Columbine Trail and US Hwy 17/92. The development is characterized as medium density. Potable water service is provided by Volusia County.

The planning level costs to retrofit the area with central sewer are as follows:

Construction:	$7.45 million
Engineering:	$0.75 million
Subtotal, public improvements:	$8.20 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$2.05 million ($5,000/parcel)
Total:	**$10.25 million** ($25,000/parcel)

Area 10
DeBary Plantation
This area contains approximately 300 lots. It is bounded by Sundown Road, Rosedown Blvd., Ranch Trail Road and a power line corridor to the west. The development is characterized as medium density. Potable water service is provided by Volusia County.

The planning level costs to retrofit the area with central sewer are as follows:

Construction:	$5.45 million
Engineering:	$0.55 million
Subtotal, public improvements:	$6.00 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$1.50 million ($5,000/parcel)
Total:	**$7.50 million** ($25,000/parcel)

Area 11
St. Johns River Estates
This area contains approximately 250 lots. It is bounded by Walrock Street, West Highbanks Road, Keeble Avenue and the FEC railroad corridor to the east. The development is characterized as medium density. Potable water service is provided by Volusia County.

The planning level costs to retrofit the area with central sewer are as follows:

Construction:	$4.55 million
Engineering:	$0.45 million
Subtotal, public improvements:	$5.00 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$1.25 million ($5,000/parcel)
Total:	**$6.25 million** ($25,000/parcel)

Area 12
Summerhaven
This area contains approximately 160 lots. It is bounded by Springleaf Drive, Interstate 4, Hufford Drive and Hayman Drive. The development is characterized as medium density. Potable water service is provided by Volusia County.

The planning level costs to retrofit the area with central sewer are as follows:

Construction:	$2.91 million
Engineering:	$0.29 million
Subtotal, public improvements:	$3.20 million ($20,000/parcel)
Sewer impact fee and on-site improvements:	$0.80 million ($5,000/parcel)
Total:	**$4.00 million** ($25,000/parcel)

The total planning level cost to retrofit the identified areas within the Gemini Springs Basin with central water and sewer is estimated at $120 million.

The following is summary of the planning level costs to retrofit the four (4) priority water body areas with central sewer.

Priority Area	Number of Septic Systems	Cost in Millions
Mosquito Lagoon Watershed	1,416	$ 39.6
Halifax River Watershed	4,950	$ 99.0
Blue Spring Basin	3,590	$ 95.33
Gemini Spring Basin	4,525	$ 119.48
TOTAL	**14,481**	**$ 353.43**

Table 4 - 1
Septic Tank Elimination Plan
Summary by Service Area

Service Area	Sub Area	Description	# Lots	Service Provider	New Service	($ millions) Engineering	Construction	Connection	Total (millions)	Per Parcel Average
Southeast	1	Indian Harbor Estates	304	V.C.	Sewer Only	$ 0.410	$ 4.150	$ 1.520	$ 6.080	$ 20,000
Volusia	2	River Rd RV Parks (3)	N/A	V.C.	Water/Sewer	0.150	1.470	0.900	2.520	N/A
	3	Waterway Estates	204	V.C.	Sewer Only	0.440	4.380	1.210	6.030	$ 29,559
	4	Cory Estates	180	Edgwtr	Sewer Only	0.340	3.420	0.940	4.700	$ 26,111
	5	Waterfront Park	40	Edgwtr	Sewer Only	0.090	0.910	0.200	1.200	$ 30,000
	6	Lyon Subdivision	47	V.C.	Water/Sewer	0.110	1.070	0.290	1.470	$ 31,277
	7	Jones Fish Camp	66	V.C.	Water/Sewer	0.150	1.500	0.460	2.110	$ 31,970
	8	Oak Hill East	230	V.C.	Water/Sewer	0.420	4.160	1.610	6.190	$ 26,913
	9	Mobile Home Village	175	V.C.	Water/Sewer	0.320	3.180	1.230	4.730	$ 27,029
	10	Oak Hill West	170	V.C.	Water/Sewer	0.310	3.090	1.190	4.590	$ 27,000
		Subtotal - Southeast	1,416			$ 2.740	$ 27.330	$ 9.550	$ 39.620	$ 27,980
Halifax River	1	River Breeze Estates	1,010	O.B	Sewer Only	$ 1.380	$ 13.770	$ 5.050	$ 20.200	$ 20,000
Watershed	2	Sunny Shores	780	O.B	Sewer Only	1.060	10.640	3.900	15.600	$ 20,000
	3	Roberta Heights	860	O.B	Sewer Only	1.170	11.730	4.300	17.200	$ 20,000
	4	Aqua Vista	470	O.B	Sewer Only	0.640	6.410	2.350	9.400	$ 20,000
	5	Ormond Shore Estates	700	O.B	Sewer Only	0.950	9.550	3.500	14.000	$ 20,000
	6	Imperial Heights	340	O.B	Sewer Only	0.460	4.640	1.700	6.800	$ 20,000
	7	Avalon by the Sea	490	O.B	Sewer Only	0.670	6.680	2.450	9.800	$ 20,000
	8	Fairwinds	190	O.B	Sewer Only	0.260	2.590	0.950	3.800	$ 20,000
	9	Ormond Beach Plaza	110	O.B	Sewer Only	0.150	1.500	0.550	2.200	$ 20,000
		Subtotal - Halifax	4,950			$ 6.740	$ 67.510	$ 24.750	$ 99.000	$ 20,000
Blue Spring	1	Orange City Terrace	610	V.C.	Water/Sewer	$ 1.110	$ 11.090	$ 4.270	$ 16.470	$ 27,000
Basin	2	Orange City Terrace	540	V.C.	Water/Sewer	0.980	9.820	3.780	14.580	$ 27,000
	3	West Highlands	490	V.C.	Water/Sewer	0.890	8.910	3.430	13.230	$ 27,000
	4	West Highlands	500	V.C.	Water/Sewer	0.910	9.090	3.500	13.500	$ 27,000
	5	West Highlands	450	V.C.	Water/Sewer	0.820	8.180	3.150	12.150	$ 27,000
	6	Orange City Hills	150	V.C.	Sewer Only	0.275	2.725	0.750	3.750	$ 25,000
	7	Orange City Hills	400	V.C.	Water/Sewer	0.730	7.270	2.400	10.400	$ 26,000
	8	Breezewood	450	V.C.	Sewer Only	0.820	8.180	2.250	11.250	$ 25,000
		Subtotal - Blue Spring	3,590			$ 6.535	$ 65.265	$ 23.530	$ 95.330	$ 26,554
Gemini Springs	1	Plantation Estates	480	V.C.	Water/Sewer	$ 0.870	$ 8.730	$ 3.360	$ 12.960	$ 27,000
Basin	2	Plantation Estates	405	V.C.	Water/Sewer	0.740	7.360	2.840	10.940	$ 27,012
	3	Plantation Estates	360	V.C.	Water/Sewer	0.650	6.550	2.520	9.720	$ 27,000
	4	Plantation Estates	350	V.C.	Water/Sewer	0.640	6.360	2.450	9.450	$ 27,000
	5	Plantation Estates	580	V.C.	Water/Sewer	1.050	10.550	4.060	15.660	$ 27,000
	6	Plantation Estates	460	V.C.	Water/Sewer	0.840	8.360	2.760	11.960	$ 26,000
	7	Miller Acres	380	V.C.	Water/Sewer	0.690	6.910	2.660	10.260	$ 27,000
	8	Lake Marie Estates	390	V.C.	Water/Sewer	0.710	7.090	2.730	10.530	$ 27,000
	9	Lake Marie Estates	410	V.C.	Sewer Only	0.750	7.450	2.050	10.250	$ 25,000
	10	DeBary Plantation	300	V.C.	Sewer Only	0.550	5.450	1.500	7.500	$ 25,000
	11	St. Johns River Estates	250	V.C.	Sewer Only	0.450	4.550	1.250	6.250	$ 25,000
	12	Summerhaven	160	V.C.	Sewer Only	0.290	2.910	0.800	4.000	$ 25,000
		Subtotal - Gemini Springs	4,525			$ 8.230	$ 82.270	$ 28.980	$ 119.480	$ 26,404
		GRAND TOTAL	**14,481**			**$ 24.245**	**$ 242.375**	**$ 86.810**	**$ 353.430**	$ 24,406