

**Conceptual Master Plan
Of Water and Wastewater Utility Integration
St. Lucie County
Phase II**

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List of Acronyms

| | |
|--------|---|
| AADF | annual average daily flow |
| BEBR | Bureau of Economic and Business Research |
| ERC | equivalent residential connections |
| FDEP | Florida Department of Environmental Protection |
| FPUA | Ft. Pierce Utility Authority |
| GPD | Gallons per day |
| IWRF | Island Water Reclamation Facility |
| JEA | James E. Anderson water treatment facility |
| MDF | maximum daily flow |
| MG | million gallons |
| MGD | million gallons per day |
| MMADF | maximum month average daily flow |
| MWRF | Mainland Water Reclaim Facility |
| NCRWTP | North County Regional Wastewater Treatment Plant |
| NHIWRF | North Hutchinson Island Wastewater Reclaim Facility |
| NPDES | National Pollution Discharge Elimination System |
| SFWMD | South Florida Water Management District |
| SHIWRF | South Hutchinson Island Water Reclaim Facility |
| SLCU | St. Lucie County Utilities |
| TMADF | Three-month average daily flow |
| UEC | Upper East Coast |
| WTF | water treatment facility |
| WWTF | wastewater treatment facility |
| WWTP | wastewater treatment plant |

1.0 INTRODUCTION

This conceptual master plan of water and wastewater utilities integration for St. Lucie County is a continuation of a previous study that investigated the feasibility of integrating all water and wastewater utilities within the county. As part of the previous study, Metcalf & Eddy (M&E) investigated the feasibility of integrating the water and wastewater utilities of St. Lucie County, Fort Pierce, Port St. Lucie and St. Lucie West Services District. As a result of that study, St. Lucie County Utilities and the city of Fort Pierce indicated their desire to move forward with Phase II providing for additional investigation into the integration of their utility systems in the portion of the county located to the north of Midway Road.

The goal of the current study, "Conceptual Master Plan of Water and Wastewater Utility Integration, St. Lucie County - Phase II" is to expand on the regionalization information gathering efforts performed in Phase I. As part of this effort, M&E collected additional information related to regionalization efforts between the city of Fort Pierce and St. Lucie County. A template of potential water and wastewater demands, population projections and locations of future growth and facilities within the study area was prepared in the form of a conceptual master plan as a basis for additional regionalization discussion between the stakeholders.

2.0 METHODOLOGY

Metcalf & Eddy met with the planning departments and water and wastewater providers for the city of Fort Pierce and St. Lucie County in order to collect documentation to augment information gathered during Phase 1. Information specific to Phase II was collected with the goal of facilitating regionalization efforts for the area of the county north of Midway Road. In order to produce the framework of a conceptual master plan for that area, information was collected on current and projected populations, proposed developments including Developments of Regional Impact (DRI's), and the need and location of future utility infrastructure and distribution systems. This information was then used to form a conceptual master plan that provided the basis for discussion between stakeholders.

As part of the development of the conceptual master plan, population growth was projected in 5-year increments through the year 2025 in order to determine probable locations of high growth. Information on the location and timeline of proposed developments in northern St. Lucie County, including Developments of Regional Impact (DRI's), was also obtained from the planning departments of each stakeholder. In addition, the locations of collection and distribution systems were analyzed to aid in locating future facilities in areas of high projected growth. During discussions, M&E also solicited input from utility managers and staff on the condition and remaining life of existing facilities to determine timelines of facility closures.

Discussions also involved stakeholder plans for expansion of existing water reuse and the potential to exploit reuse opportunities during future construction of wastewater facilities. Similarly, District staff were queried regarding the potential of certain CERP projects to provide supplemental irrigation supply to the stakeholders through the use of aquifer storage and recovery.

Finally, the stakeholders were prompted to provide their vision of what a post-regionalization utility system would entail for their current customers and what type of issues they could foresee with such a system.

2.1 DISCUSSIONS WITH FT. PIERCE UTILITIES AUTHORITY

Currently, the city of Fort Pierce, with a population of approximately 39,000, is served by one water treatment plant and one wastewater plant owned and operated by Fort Pierce Utilities Authority (FPUA). The water treatment plant has permitted maximum capacity of 15.99 million gallons per day (MGD) while the wastewater treatment plant has a permitted capacity of 10 MGD average daily flow. The projected water capacity is expected to remain above the current demand projections through the year 2025. Wastewater flow projections indicate that system

capacity may be exceeded slightly by late 2009; therefore, FPUA has begun preliminary design of a new facility that will provide approximately 5 MGD of additional treatment capacity.

During the interview with FPUA, M&E was provided various documents and geographical information system (GIS) files. These files provided the ability to directly calculate the acreage of developments and various land use classifications. FPUA also shared their standard assumptions used when calculating equivalent residential connections (ERC), the number of ERC's per acre and the number of people assigned to each ERC. In addition, FPUA provided the assumptions they use to determine the daily water usage of each ERC. An updated 2006 FPUA Master Plan was also provided.

2.2 DISCUSSIONS WITH ST. LUCIE COUNTY UTILITIES

St. Lucie County Utilities (SLCU) operates two water treatment plants and five wastewater treatment plants that serve the north portion of the County along with North and South Hutchinson Island. The combined water treatment capacity is approximately 0.3 MGD and the combined wastewater treatment capacity is approximately 2.4 MGD. The County also purchases water through a bulk water agreement with the Fort Pierce Utilities Authority. Future water demand projections for the County indicate insufficient capacity in the existing system. However, as in the past, deficit capacity is planned to be offset by bulk water purchases from the Fort Pierce Utilities Authority. Wastewater treatment capacity is expected to remain above projected flows through the year 2025.

During interviews, M&E gathered population projections through the year 2025 for the St. Lucie County service area. M&E also gathered GIS maps with information on proposed developments such as land area, number of ERC's, project status and project type.

3.0 PLANNING AREAS

Although utility regionalization is the ultimate goal of both SLCU and FPUA, the region is too large to be serviced by either stakeholder from their existing or planned infrastructure base. Therefore, a series of six planning areas are proposed in the study area that may be used as regional utility providers. This concept will allow for regional utility services to be provided within each planning area without the need to transport water and wastewater over long distances.

3.1 ESTABLISHMENT OF PLANNING AREAS

With the goal of preventing the transmission of water and wastewater over long distances, the study area was divided into six proposed planning areas ranging in size from 34 to 76 square miles. A map depicting the boundaries of each planning area is shown in **Figure 3.1**. The locations of Planning Areas 1 and 6 were selected in a manner that allows for existing infrastructure to continue serving the customers of their respective areas. For example, the boundary of Planning Area 6 was drawn in a manner that will minimize existing FPUA customers from being located in a new service area after regionalization.

As shown in **Figure 3.1**, Planning Area 1 is bordered to the north by Indian River County and to the west and east with Interstate 95 and the Indian River Lagoon, respectively. Planning Area 1 (**Figure 3.2**) also encompasses north Hutchinson Island and is bordered to the south roughly along the south boundary of the airport and by Planning Area 6. Planning Area 2 (**Figure 3.3**) is bordered to the north, east and south by Indian River County, Interstate 95 and the Florida Turnpike, respectively. Planning Area 3 is bordered by Planning Area 2 to the east, Planning Area 4 to the south and the county line to the north and west. Planning Area 5 (**Figure 3.4**) is bordered to the north and east by the Florida Turnpike and to the south by West Midway Road. Planning Area 6 (**Figure 3.5**) includes South Hutchinson Island and is delineated to the west by the Florida Turnpike, to the south by Midway Road and Easy Street and to the north by Area 1.

Planning Area 6 is subdivided into an additional sub-area, Area 6A, located south of the FP&L Nuclear Power Plant and extending south to the Martin County line. Planning Area 6A was separated from Area 6 because that area receives its water from Martin County through a long term bulk water agreement.

Table 3.1 lists the approximate size in square miles of each of the six planning areas.

Table 3.1- Approximate Square Miles of Planning Areas

| Planning Area | Approximate Sq. Miles |
|---------------|-----------------------|
| 1 | 37 |
| 2 | 34 |
| 3 | 37 |
| 4 | 84 |
| 5 | 37 |
| 6 and 6A | 65 |
| Total | 294 |

3.2 POPULATION PROJECTIONS

Actual 2000 and projected 2030 populations by planning area were derived from the *2030 Regional Long Range Transportation Plan* drafted by the Martin & St Lucie Metropolitan Planning Organizations. These projections are based on Transportation Analysis Zones (TAZ) established in the report which in turn are based largely upon estimates from the Bureau of Economic and Business Research (BERB) of the University of Florida and U. S. Census data.

Populations for the 5-year increments from 2005 through 2025 were interpolated from the above mentioned data assuming a straight line interpolation between the actual 2000 populations and the projected 2030 populations. Population projections by planning area through 2025 are shown in **Table 3.2a**.

Table 3.2a - Projected Population by Planning Area

| Planning Area | 2005 | 2010 | 2015 | 2020 | 2025 |
|---------------|--------|--------|--------|--------|---------|
| 1 | 27,365 | 37,565 | 47,764 | 57,963 | 68,163 |
| 2 | 7,242 | 14,484 | 21,727 | 40,000 | 60,000 |
| 3 | 39 | 45 | 51 | 56 | 62 |
| 4 | 688 | 906 | 1,123 | 1,340 | 1,558 |
| 5 | 5,389 | 9,300 | 13,210 | 17,120 | 21,031 |
| 6 | 69,394 | 77,628 | 85,863 | 94,097 | 102,331 |
| 6A | 4,900 | 4,998 | 5,097 | 5,196 | 5,294 |

Note: Population values for 2005 and 2030 were obtained from the 2030 Regional Long Range Transportation Plan-Martin & St Lucie Metropolitan Planning Organizations

A majority of the planning areas are expected to exhibit rapid growth rates over the course of the study period. Planning Area 2 is expected to experience the greatest projected growth (728%), followed by Area 5 (290%), Area 1 (149%) and Area 4 (126%). Although Areas 3 and 4 show a large percentage increase in growth over the next 20 years, the absolute change in population over the study period is not significant and doesn't warrant new water or wastewater facilities.

Conversely, although Planning Area 6 has a comparatively small percentage increase in growth, the absolute change in population, approximately 34,000, people is significant.

Planning Area 2 shows a population of approximately 60,000 people by 2025 with the bulk coming from the Cloud Grove development. Although this development is still in the preliminary stages there have been estimates that its population could reach close to 37,000 people with the majority of these occurring near the end of the study period. Although the above mentioned transportation study did not account for the population of Cloud Grove, the projected population numbers shown in **Table 3.2a** were derived to include this development.

Many municipalities convert population data into a unit called Equivalent Residential Connections (ERC). These units are intended to more closely correlate population data to the number of homes in an area. For the purpose of this study, each ERC is equal to 2.5 people. The ERC numbers shown in **Table 3.2b** below were calculated by dividing the population projections from **Table 3.2a** by 2.5.

Table 3.2b - Projected ERC's by Planning Area

| Planning Area | 2005 | 2010 | 2015 | 2020 | 2025 |
|---------------|--------|--------|--------|--------|--------|
| 1 | 10,946 | 15,026 | 19,106 | 23,185 | 27,265 |
| 2 | 2,897 | 5,794 | 8,691 | 16,000 | 24,000 |
| 3 | 16 | 18 | 20 | 23 | 25 |
| 4 | 275 | 362 | 449 | 536 | 623 |
| 5 | 2,156 | 3,720 | 5,284 | 6,848 | 8,412 |
| 6 | 27,758 | 31,051 | 34,345 | 37,639 | 40,932 |
| 6A | 1,960 | 1,999 | 2,039 | 2,078 | 2,118 |

3.3 PROJECTED WATER DEMANDS BY PLANNING AREA

Table 3.3 shows present and projected water demands by planning areas per year. Water demands in Planning Areas 1 through 5, consisting largely of St. Lucie County residents, were calculated by multiplying the corresponding ERC by 300 gallons per day (GPD). ERC's for Planning Areas 6 and 6A, consisting of Ft. Pierce residents, were multiplied by 250 GPD. The different conversion factors employed were based on each utilities previously used quantities for each ERC. These values were retained to provide consistency with present planning in their jurisdiction.

Table 3.3 - Projected Water Demand by Planning Area

| Planning Area | 2005 | 2010 | 2015 | 2020 | 2025 |
|---------------|------|------|------|------|------|
| | MGD | MGD | MGD | MGD | MGD |
| 1 | 3.3 | 4.5 | 5.7 | 7.0 | 8.2 |
| 2 | 0.9 | 1.7 | 2.6 | 4.8 | 7.2 |
| 3 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 |
| 4 | 0.08 | 0.11 | 0.13 | 0.16 | 0.19 |
| 5 | 0.6 | 1.1 | 1.6 | 2.1 | 2.5 |
| 6 | 6.9 | 7.8 | 8.6 | 9.4 | 10.2 |
| 6A | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |

Planning Areas 1, 2, 5 and 6 are projected to undergo significant increases in water demands over the study period. Although Planning Area 5 shows an increase in demand over the next twenty years, the rural nature of the population base precludes the addition of water facilities for this area. Planning Area 6A is not expected to require a significant increase in water demand over the study period. This sub area is currently being serviced through bulk water agreements between FPUA and Martin County Utilities. Under these agreements, there are no current or future needs for additional utilities in this area.

3.4 PROJECTED WASTEWATER FLOWS BY PLANNING AREA

Projected wastewater flows were calculated using 80% of the water demands shown in Table 3.3. The remaining 20 percent accounts for losses due to leaking pipes and water lost to irrigation. **Table 3.4** below, tabulates the projected wastewater flows by planning area for the study period.

Similar to the discussion regarding water demands in Section 3.3, Planning Areas 1, 2, 5 and 6 also are projected to undergo significant increases in wastewater demands over the study period. And, although Planning Area 5 also shows an increase in demand over the next twenty years, the rural nature of the population base precludes the addition of wastewater facilities for this area. Planning Area 6A, as all South Hutchinson Island, is currently being served by the South Hutchinson Island Water Reclamation Facility which is designed and constructed for the island's built-out flows.

Table 3.4 - Projected Wastewater Flows by Planning Area

| Planning Area | 2005 | 2010 | 2015 | 2020 | 2025 |
|---------------|------|------|------|------|------|
| | MGD | MGD | MGD | MGD | MGD |
| 1 | 2.6 | 3.6 | 4.6 | 5.6 | 6.5 |
| 2 | 0.7 | 1.4 | 2.1 | 3.8 | 5.8 |
| 3 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| 4 | 0.07 | 0.09 | 0.11 | 0.13 | 0.15 |
| 5 | 0.5 | 0.9 | 1.3 | 1.6 | 2.0 |
| 6 | 0.4 | 6.2 | 6.9 | 7.5 | 8.2 |
| 6A | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |

Note: Projected wastewater flows were calculated using 80% of the projected water demands

3.5 EXISTING WATER & WASTEWATER FACILITIES BY SERVICE AREA

Planning Areas 2 through 5 currently have no existing water or wastewater treatment facilities. These areas currently have no development on a scale that in the past has warranted the construction of utility infrastructure. Current water and wastewater for residents in this area is supplied by private groundwater wells and septic tanks.

Planning Area 1 currently has five water treatment facilities, five wastewater treatment plants and two water reclamation facilities. **Table 3.5a** summarizes the current treatment plants in Planning Area 1 along with the facility operators.

The Holiday Pines Reverse Osmosis WTP, located just north of Indrio Road, was purchased from the Holiday Pines Service Corporation by St. Lucie County in 1999. It receives water from two surficial wells and serves all of the Holiday Pines subdivision in addition to some commercial and residential areas of Kings Highway and Indrio Rd. Due to the residential nature of the surrounding area, there is little room for future expansion. The Holiday Pines WTP is slated for decommissioning in 2012.

The Lakewood Park Subdivision WTP, constructed in 1976, is located approximately 2 miles northwest of the Holiday Pines Reverse Osmosis WTP. The latest SLCU 2004 Updated Master Plan indicates the raw water well, ground storage tank and cascade aerator are in poor condition and in need of replacement. The subdivision is not individually metered and each connection is charged a flat rate each month. The Holiday Pines Reverse Osmosis WTP and the Lakewood Park Subdivision WTP are the only two water treatment facilities owned by the SLCU. The remaining three water treatment facilities in Planning Area 1 are privately owned.

Table 3.5a - Planning Area 1 - Existing Facilities and Operators

| Facilities | Operated by |
|--|----------------------------|
| Fairwinds Golf Course WRF | St. Lucie County Utilities |
| Holiday Pines Reverse Osmosis WTP | St. Lucie County Utilities |
| Holiday Pines WWT Package Plant | St. Lucie County Utilities |
| Lakewood Park Subdivision WTP | St. Lucie County Utilities |
| Lakewood Park Subdivision WWTP | St. Lucie County Utilities |
| North Hutchinson Island WRF | St. Lucie County Utilities |
| Panther Woods (LS) | Private Utility |
| Panther Woods WWTP | Private Utility |
| Spanish Lakes Country Club Reverse Osmosis WTP | Private Utility |
| Spanish Lakes Country Club WWTP | Private Utility |
| Spanish Lakes Fairways Reverse Osmosis WTP | Private Utility |
| Spanish Lakes Fairways WRF | Private Utility |

Notes:

1. Holiday Pines WWT Package Plant to be decommissioned in 2012
2. Fairwinds Golf Course WRF to be decommissioned in 2007
3. Lakewood Park Subdivision WWTP to be decommissioned approximately 2009-2011

The three small private water supply facilities existing in Planning Area 1 are Panther Woods Lime Softening WTP, Spanish Lakes Country Club Reverse Osmosis WTP and Spanish Lakes Fairway Reverse Osmosis WTP. These utilities were unable to annex with an existing utility at the time of their development and have therefore formed their own small utility. There are no present plans for near future decommissioning of these facilities.

The SLCU owns two water reclamation facilities, Fairwinds Golf Course WRF and North Hutchinson WRF; and three wastewater treatment plants, the Holiday Pines WWTP and the Lakewood Park Subdivision WWTP. The Fairwinds WRF located at the County owned Fairwinds Golf Course treats flows from the Fairwinds Golf Course clubhouse, the airport and the Airport Industrial Park located to the east of the airport. According to interviews with SLCU personnel, the Fairwinds WRF is scheduled to be decommissioned in 2007 and its flows diverted to a regional facility.

The North Hutchinson Island Wastewater Reclamation Facility, located on a four acre county-owned site on the west side of Route A1A, was completed and placed in operation in 1996. The current facility replaced two package treatment plants located at the site in addition to two package treatment plants at the Bryn Mawr utility site. Reclaimed water is reused through irrigation of nearby residents. The latest inspection, documented in the 2004 St. Lucie County Utilities North Hutchinson Island Annual Inspection and Evaluation Report, showed the facility to be in good condition.

The Holiday Pines WWTP and the Lakewood Park Subdivision WWTP operate as an extended aeration package treatment plant and an extended aeration modular precast plant, respectively. Lakewood Park plant produces only secondary treatment standard water that is disposed of into a single cell percolation pond. Although the single cell percolation pond has sufficient capacity for effluent disposal needs, a single cell pond does not conform to FDEP regulations. As a result, an FDEP Administrative Order was issued to address this violation. The Holiday Pines WWTP is slated to be decommissioned in 2012 while the Lakewood Park Subdivision WWTP is scheduled for decommissioning between the years of 2009 and 2011. Currently, their flows are planned to be diverted to the New Mainland Water Reclamation Facility.

In addition to the above mentioned water and wastewater treatment facilities, SLCU also owns water facilities in the North Hutchinson Island Service Area and the Airport Utility District Distribution System. The North Hutchinson Island Service Area consist of a water distribution system that serves all development on the island and storage and pumping at the Bryn Mawr utility site. All water distributed through this system is purchased in bulk from FPUA. The distribution system currently serves approximately 3,650 ERC's. Current plans are to replace the facilities in the future with a 2 million gallon pre-stressed concrete storage tank and high service pumping facility.

The potable water distribution system that serves the St. Lucie County International Airport is owned and operated by SLCU. The water is purchased in bulk from FPUA and serves the fire station, airport facilities and businesses located south of the main runway between Hammond Road and Industrial 33rd Street. Currently there are approximately 64 commercial connections serviced by this distribution system

Panther Woods WWTP, Spanish Lakes Fairways WRF and the Spanish Lakes Country Club WWTP are the only privately owned wastewater/water reclamation treatment plants in Planning Area 1. These facilities were unable to annex with an existing utility at the time of their development and have therefore formed their own small utility. All three are small package plants with little room for meaningful expansion because of their location.

Planning Area 6 currently has two water treatment facilities, one wastewater treatment facility and two water reclamation facilities. The Henry Gahn WTF, owned and operated by FPUA, houses two treatment plants: a reverse osmosis plant and lime softening plant. It is located within the city of Fort Pierce providing water to the city, North Hutchinson Island, South Hutchinson Island and five developments currently in the St. Lucie County service area. **Table 3.5b** summarizes the current treatment plants in Planning Area 6.

Table 3.5b - Planning Area 6 Existing Facilities and Operators

| Facilities | Operated by |
|---|-------------------------------|
| Fort Pierce Utility Authority WRF | Fort Pierce Utility Authority |
| Henry A Gahn Lime Softening and Reverse Osmosis WTP | Fort Pierce Utility Authority |
| The Grove WTP | Private Utility |
| The Grove WWTP | Private Utility |
| South Hutchinson Island WRF | St. Lucie County Utilities |

The Grove WTF and WWTF are located on south U.S. 1 between Fort Pierce and the City of Port St. Lucie. Because of its geographical location, if the Grove were to be annexed it would likely be annexed by FPUA or PSLU. At the present time there are no existing SLCU connections in the vicinity to feasibly connect to the Grove. Bill Thiess, FPUA utility director, stated in a telephone conversation with M&E that PSLU has expressed interest in annexing with the Grove Condominium many times, however, the condo is privately owned and it is almost impossible to get the 300 - 400 owners to agree to annexation.

The South Hutchinson Island WRF is owned and operated by SLCU and is located in the southern part of South Hutchinson Island. Prior to completion in 1997 the area was serviced by various package plants. Along with the construction of the new plant, lift stations were upgraded or replaced as needed and force mains were installed to connect the lift stations to the new water Reclamation Facility (WRF). The South Hutchinson Island wastewater collection system consists of approximately 12 miles of PVC force main between the Fort Pierce city limits and the Martin County / St. Lucie County line to the south.

The Fort Pierce Utilities Authority Water Reclamation Facility, located on Seaway Drive, is an activated sludge system that serves approximately 49,029 people in northeastern St. Lucie County. In the future, the Utility will provide services to regions of St. Lucie County located north and west of the existing FPUA retail service area.

The actual average flow treated at the plant is 5.62 MGD With disposal via one Class I injection well with an FDEP permitted injection capacity of 14.92 MGD maximum peak hour flow. Approximately 300,000 gallons per day of reclaimed water are used to supply irrigation and wash down needs at the Island Water Reclamation Facility. The Island Water Reclamation Facility was also previously regulated under FDEP permit to discharge to the Indian River Lagoon under the National Pollution Discharge Elimination System (NPDES).

For locations of the facilities and existing infrastructure in the planning areas please refer to **Figures 3.2 through 3.5**.

3.6 WATER CAPACITIES

Table 3.6 shows the anticipated water capacities in each of the planning areas according to current plans by FPUA and SLCU. These capacities account for future expansion of existing facilities, construction of new facilities and the decommissioning of existing facilities. As discussed previously in this report, Planning Area 1 water facilities include Holiday Pines WTP, Lakewood Subdivision WTP, Panther Woods WTP, Spanish Lakes Country Club WTP, and Spanish Lakes Fairways WTP. Planning Area 6 facilities include The Grove WTP and Henry A. Gahn WTP. Planning Areas 2 through 5 contain no current or projected facilities.

| Planning Area | 2005 | 2010 | 2015 | 2020 | 2025 |
|---------------|---|------|------|------|------|
| | MGD | MGD | MGD | MGD | MGD |
| 1 | 1.7 | 1.7 | 1.5 | 1.5 | 1.5 |
| 2 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 |
| 6 | 16.1 | 18.0 | 25.3 | 25.3 | 25.3 |
| 6A | Water services provided by Martin County through Bulk Water agreement | | | | |

Note: Currently, Planning Areas 2 through 5 have no current or projected capacity requirements.

SLCU currently has no firm plans to increase water capacity in Area 1. However, they are currently considering the construction of a new WTP and WWTP in the area and are in preliminary discussions with the appropriate regulatory agencies. Current discussions with SLCU personnel indicate they are considering locating the facilities in the area of the airport. In Planning Area 6, the Henry A. Gahn WTP will undergo an expansion by 2015 to a 25.3 MGD capacity facility. Planning Area 6A is currently serviced by Martin County Utilities through a Bulk Water Agreement. While exercising the terms of this agreement, it is not anticipated that new water facilities will be required.

3.7 WASTEWATER CAPACITIES

The projected capacities presented in **Table 3.7** are based on current expansion projections of existing water facilities. Planning Area 1 treatment plants include Holiday Pines WWTP, Lakewood WWTP, Panther Woods WWTP, Spanish Lakes Country Club WWTP, Spanish Lakes Fairways WRF, North Hutchinson Island WWTP, and the North County Regional WRF planned for 2012. Planning Area 6 treatment plants include The Grove WWTP, Ft. Pierce Utility Authority WRF and the South Hutchinson Island WRF. Planning Areas 2 through 5 contain no current or projected capacities.

Table 3.7 – Wastewater Facilities Expansion Projections by Planning Area

| Planning Area | 2005 | 2010 | 2015 | 2020 | 2025 |
|---------------|------|------|------|------|------|
| | MGD | MGD | MGD | MGD | MGD |
| 1 | 1.36 | 1.32 | 2.16 | 2.16 | 3.5 |
| 2 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 |
| 6 | 11.6 | 16.6 | 21.6 | 16.6 | 16.6 |
| 6A | N/A* | | | | |

Notes: Currently, Planning Areas 2 through 5 have no current or projected capacity

In Planning Area 1, Holiday Pines WWTP, Lakewood Park WWTP, and Fairwinds Golf Course are slated for decommissioning by 2012, 2011 and 2007, respectively. In Planning Area 6, the FPUA WRF on Seaway Drive will be phased out while the new Mainland WRF is started. The current plans are to operate both plants simultaneously for 5 to 15 years and decommission the Seaway Drive facility in 10 to 20 years. Planning Area 6A is currently served by South Hutchinson WRF.

4.0 PROJECTED DEFICIT AND RECOMMENDED CAPACITY IMPROVEMENTS

4.1 WATER DEFICIT AND PROPOSED PLANNING AREA FACILITIES

Currently, Planning Areas 1 and 6 are the only areas with water treatment facilities currently in place. Planning Area 6 is served by FPUA while Planning Area 1 is largely served by SLCU through either their own facilities or through bulk water agreements with FPUA. **Table 4.1** exhibits the projected water capacity deficit for each Planning Area through the study period. Although Planning Areas 3 through 5 have no current or proposed treatment plants due to low projected growth, the deficits shown in the table will be met by private wells and septic systems.

Planning Area 1 water deficits are currently being met by bulk water agreements between FPUA and SLCU. Specifically, developments such as Waterstone Estates, Portofino Shores and Coconut Cove and all of North Hutchinson Island are presently, or will be in the future, served by FPUA through agreements with the County. Planning Area 6 shows a significant surplus throughout the 20 year study period. FPUA currently serves the regions mentioned above as well as the majority of South Hutchinson Island. In addition, two developments which are in Planning Area 5, Creekside and Provinces DRI, are expected to be served by FPUA. Planning Area 6A, as previously stated is serviced by bulk water agreements with Martin County Utilities.

Table 4.1 - Projected Water Deficit and Surplus by Planning Area (deficits in parentheses)

| Planning Area | 2005 | 2010 | 2015 | 2020 | 2025 |
|---------------|---|--------|--------|--------|--------|
| | MGD | MGD | MGD | MGD | MGD |
| 1 | (1.62) | (2.85) | (4.23) | (5.46) | (6.68) |
| 2 | (0.87) | (1.74) | (2.61) | (4.8) | (7.2) |
| 3 | (0) | (0.01) | (0.01) | (0.01) | (0.01) |
| 4 | (0.08) | (0.11) | (0.13) | (0.16) | (0.19) |
| 5 | (0.65) | (1.12) | (1.59) | (2.05) | (2.52) |
| 6 | 9.12 | 10.24 | 16.68 | 15.86 | 15.04 |
| 6A | Water services provided by Martin County through Bulk Water agreement | | | | |

Notes:

1. Planning Area 1 water demands are currently being met through Bulk Water Agreements between FPUA and SLCU.
2. Water deficit for 2025 shown in Area 2 accounts for estimated population of Cloud Grove.

4.2 WATER RECOMMENDATIONS

Planning Area 1 - The current water facilities in this area are not conducive to the level of expansion required to meet future demands. As shown in **Table 4.1**, the area is expected to experience a shortage in capacity approaching 7 MGD by 2025. Based on this projected deficit, it is recommended that a 6 MGD water treatment plant be built in the area north of the St. Lucie Airport property by 2015 (**Figure 4.1**). There appears to be adequate vacant land along Indrio Road for such a facility. This location provides a central facility for existing residential neighborhoods directly to the north and also for commercial expansion along US 1. Water demands beyond 2015 will require expansion of the facility to 7.0 MGD by 2020 and 8.2 MGD by 2025 (**Figure 4.2**).

In conjunction with new capacity in Area 1, the small public water treatment plants should be phased out by 2015 as currently planned by SLCU and tied in to the new centralized water treatment plant. SLCU should also make every attempt to bring the small private utilities in the planning area into the new system.

Bulk water agreements with adjacent utilities should be phased out as new capacity becomes available however; the current connection points between utilities should be maintained for future emergency interconnects.

Planning Area 2 – Planning Area 2 is the fastest growing region in the study area. The bulk of this growth is due to an emerging development named Cloud Grove that is expected to add 37,000 people to the northwest corner of Area 2. However, at the time of this study there remain many unknown factors regarding the size and timeline of development at Cloud Grove. These unknown factors result in wide ranging estimates of water and wastewater requirements that cannot, at this time, be reliably quantified. Due to the recent nature of the Cloud Grove development, the 2030 Regional Long Range Transportation Plan did not appear to take into account their population growth. However, population projections in this study, and therefore water and wastewater demands, were adjusted in an attempt to accurately quantify the addition of Cloud Grove.

Current water capacity projections by SLCU do not provide for additional infrastructure in Area 2. However, the county is in discussions with the developers of Cloud Grove regarding future water capacity that will be added as Cloud Grove comes online. Based on the water capacity deficits shown in **Table 4.1** it is recommended that a facility of 3.0 MGD be built by 2015 (**Figure 4.3**) with expansion to 7.2 MGD by 2025. However, due to the large uncertainty in population and timeline previously discussed, it is recommended that any water treatment facilities be designed in a way that allows for economic expansion.

Current discussions between the county and Cloud Grove developers have yet to resolve the location of the water treatment facility within Area 2. However, county personnel have expressed their desire to have the facility located on the eastern boundary of the development to facilitate expansion into other regions of Area 2 that are located outside the development.

Planning Areas 3, 4 and 5 – Due to the rural nature of these areas, it is not projected that additional water capacity will be required beyond the current levels supplied by private wells. The bulk of the projected population growth in these three areas will likely occur in Area 5. Should facilities be required within the planning period it is likely they will be provided through Municipal Service Benefit Units¹ until large scale treatment facilities are constructed.

Planning Area 6 - The Henry A. Gahn Water Treatment Plant currently has adequate capacity to serve the projected growth in Area 6 (**Figure 4.4**). As a result of FPUA's capacity needed for bulk water agreements with adjacent utilities, Area 6 is likely to maintain a water capacity surplus through the study period. Current bulk water agreements with SLCU should be maintained as the county increases their water treatment infrastructure. Planning Area 6 should continue service to North Hutchinson Island since the lines and repump stations are already online and working. As future facilities become available in Area 1, the potential to interconnect with the North Hutchinson infrastructure should be investigated to provide redundancy within the regionalized system. In addition, the city of Ft. Pierce should investigate the possibility of trying the regionalized system into The Grove Condominium project.

Please see Figures 4.1 through 4.5 for the locations of proposed water treatment facilities.

4.3 WASTEWATER SERVICE DEFICIT AND PROPOSED PLANNING AREA FACILITIES

Planning Areas 1 and 6 are the only planning areas currently with wastewater treatment facilities. **Table 4.2** shows projected wastewater deficits and surplus by planning area in five year increments. South and North Hutchinson Islands each have their own wastewater treatment plants which are currently managed by SCLU and designed to sustain build out conditions. Therefore no additional infrastructure is proposed for these areas. Planning Area 1 currently shows deficits which are the result of many residents continuing to be served by private septic systems. Planning Areas 2 through 5 show deficits resulting from the absence of planned facilities.

¹ MSBU's (Municipal Service Benefit Units) and are also known as "special assessments." They are a method by which the Board of County Commissioners can pay for certain specific projects by apportioning the costs to the property owners in a community or neighborhood that benefits from the projects.

Table 4.2 - Projected Wastewater Deficit by Planning Area

| Planning Area | 2005 | 2010 | 2015 | 2020 | 2025 |
|---------------|--------|--------|--------|--------|--------|
| | MGD | MGD | MGD | MGD | MGD |
| 1 | (1.27) | (2.29) | (2.43) | (3.40) | (3.04) |
| 2 | (0.70) | (1.39) | (2.09) | (2.78) | (3.63) |
| 3 | (0.0) | (0.0) | (0.0) | (0.01) | (0.01) |
| 4 | (0.07) | (0.09) | (0.11) | (0.13) | (0.15) |
| 5 | (0.52) | (0.89) | (1.27) | (1.64) | (2.02) |
| 6 | 11.21 | 10.39 | 14.73 | 9.07 | 8.41 |
| 6A | N/A* | | | | |

Note: * South Hutchison Island WRF sized and constructed to treat SHI buildout population.

4.4 WASTEWATER RECOMMENDATIONS

Planning Area 1 – Planning Area 1 is projected to require 4.6 MGD by 2015 and 6.5 MGD of capacity by the end of the study period. It is proposed that a 4.6 MGD facility be in place on Taylor Dairy Road to the northwest of the airport by 2015. This facility should be designed to accommodate 6.5 MGD by 2025. In addition, it is recommended that all small public and private wastewater facilities be phased out and connected to the regionalized system as new capacity is brought online.

Planning Area 2 – The development timeline of Cloud Grove currently has a degree of uncertainty that makes precise projections difficult at this early stage of the project. However, there is expected to be a large degree of development in Area 2 regardless of the Cloud Grove schedule. For this reason, it is recommended that a 2.4 MGD facility be constructed and online by 2015 with the potential for expansion to 5.8 MGD by 2025. As discussed above, county officials are working with developers with the goal of locating the facility along the expected eastern boundary of the proposed Cloud Grove development.

Planning Areas 3, 4 and 5 – These planning areas are not expected to undergo significant increases in population that would warrant the construction of large wastewater facilities by the regionalized utility. It is expected that existing residents will remain on septic system treatment. Developments of significance in Area 5 would likely be served by MSBU's or localized treatment systems that can be brought into the regionalized system as utility expansion moves westward.

Planning Area 6 – It is expected that the Seaway Drive WRF will be phased out beginning about 2015 or 2020. Prior to that, the Mainland WRF, located north of West Midway Rd and South West of Glades Cutoff Road, will enter service with an initial capacity of 5 MGD by 2009. The plant will increase in capacity by 5 MGD every five years to a total of 15 MGD by 2025. It is expected that the Seaway Drive facility will then be decommissioned at that time. The Grove Condominium wastewater treatment plant should also be decommissioned by 2015 and connected to the regionalized system at that time. For Planning Area 6A, it is not recommended that changes or additions be made as the SHIWRF is already operating and designed for island's build out conditions.

Please see Figures 4.1 through 4.5 for the locations of proposed wastewater treatment facilities.

FINAL DRAFT

5.0 REUSE AND SUPPLEMENTAL IRRIGATION

5.1 WATER REUSE

The state of Florida encourages the reuse of wastewater through the Water Resource Implementation Rule (Chapter 62-40 F.A.C.). This rule requires water use applicants to provide water reuse to the greatest extent feasible. However, a review of reclaimed water use in the Upper East Coast water supply area indicates a slowly expanding trend toward reuse. The regionalization of facilities in this study provides an excellent opportunity to expand this trend in St. Lucie County.

Water reuse at existing facilities should be expanded to the greatest extent possible. Large scale users such as golf courses and public green space near WRF facilities should be identified to provide potable water offsets for these large users. In addition, large scale users located in the vicinity of new developments will preclude the need for extensive reclaimed water networks. During dry periods, RCW demand outstrips capacity when all customers are connected to the system. Therefore, the identification of large scale users of potable irrigation water will provide opportunities for reuse while offering large potable water offsets. In addition, increased reuse will offer existing injection well facilities the opportunity to reduce operations.

5.2 SUPPLEMENTAL IRRIGATION SUPPLY

Supplemental irrigation supply is possible through the Comprehensive Everglades Restoration Project (CERP). The CERP Indian River Lagoon – South Feasibility Study is investigating methods to improve surface water quality in several area basins. As part of this study, several surface storage reservoirs will be constructed to provide supplemental irrigation for agricultural use. Although these reservoirs will provide valuable groundwater irrigation offsets, they are not projected to be of direct value to the regionalization effort due to their distant location.

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LBFH, Inc., 2004. "St Lucie County Utilities Water and Wastewater Master Plan Update", City of Ft. Pierce, Florida

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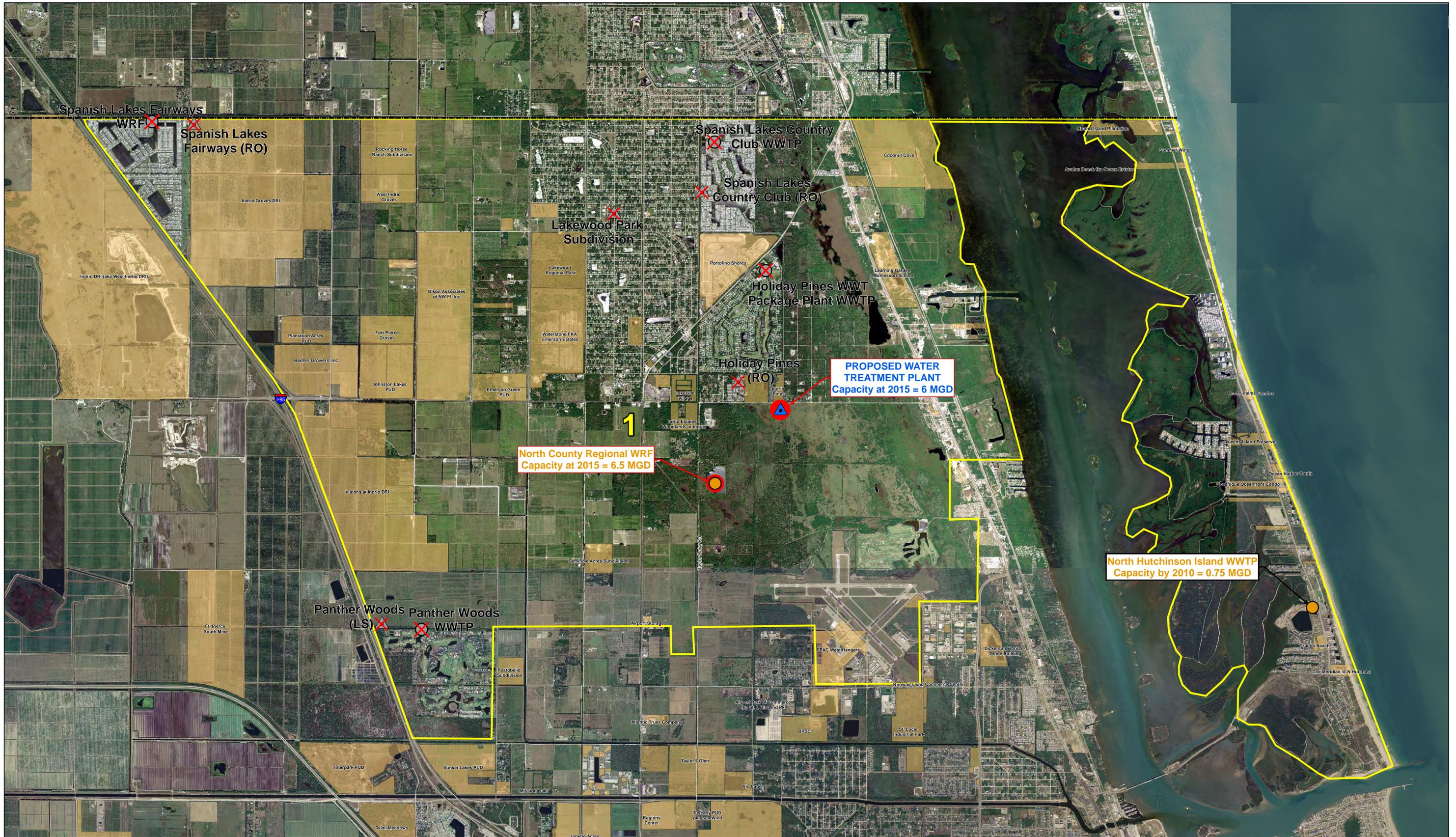
South Florida Water Management District, 2004. "Upper East Coast Water Supply Plan Planning Document - 2004 Update", West Palm Beach, Florida

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Projected Development in FPUA Service Area Updated 10-10-06.xls

FIGURES

FINAL DRAFT



PROPOSED WATER TREATMENT PLANT
Capacity at 2015 = 6 MGD

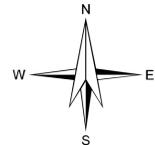
North County Regional WRF
Capacity at 2015 = 6.5 MGD

North Hutchinson Island WWTP
Capacity by 2010 = 0.75 MGD

LEGEND:

-  Proposed Water Treatment Plant Location
-  Future Water Reclamation Facility Location
-  Water Reclamation Facility Location
-  Water Treatment Plant (Decommission by 2015)
-  Waste Water Treatment or Water Reclamation Facility Locations (Decommission by 2015)
-  Planning Area Boundary
-  Proposed Development
-  St. Lucie County Boundary

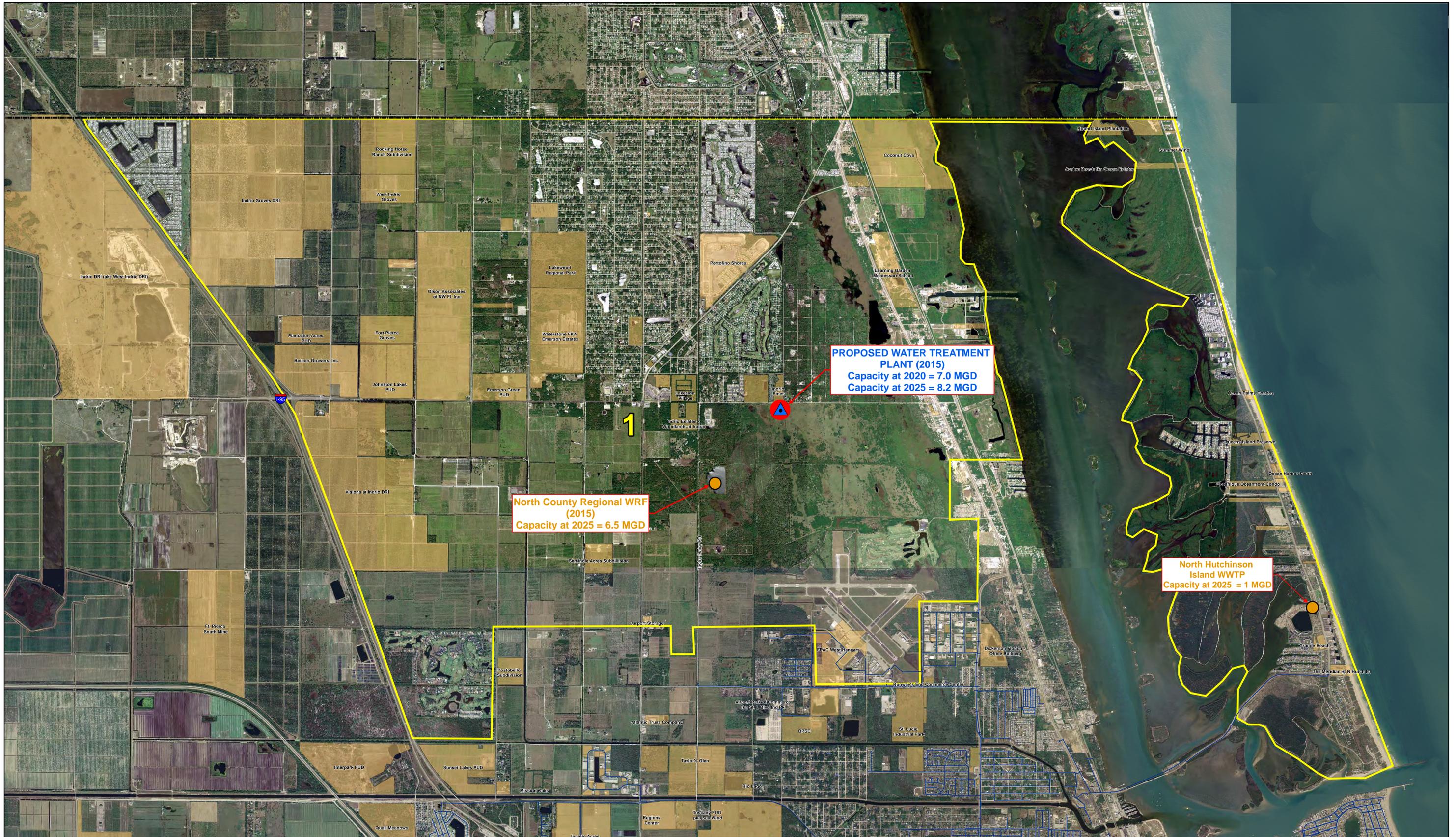
SCALE:



**PLANNING AREA ONE
PROPOSED FACILITIES
BY 2015
ST. LUCIE COUNTY, FLORIDA**



FIGURE 4.1



PROPOSED WATER TREATMENT PLANT (2015)
 Capacity at 2020 = 7.0 MGD
 Capacity at 2025 = 8.2 MGD

North County Regional WRF (2015)
 Capacity at 2025 = 6.5 MGD

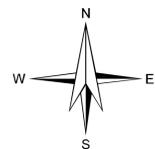
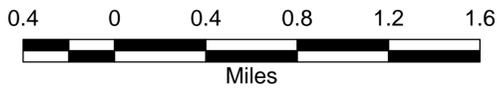
North Hutchinson Island WWTP
 Capacity at 2025 = 1 MGD

1

LEGEND:

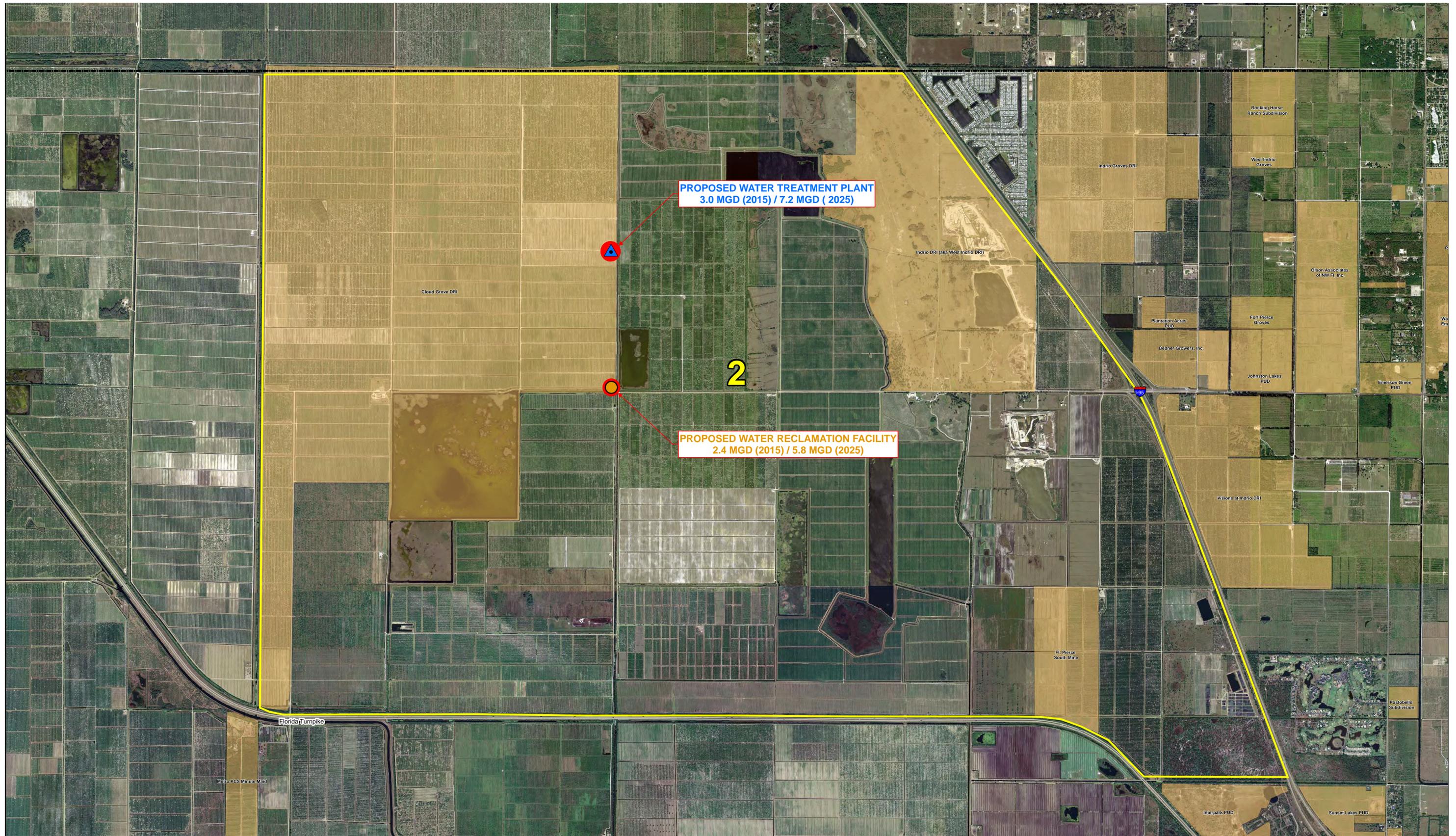
-  Proposed Water Treatment Plant Location (2015)
-  Planning Area Boundary
-  St. Lucie County Boundary
-  Water Reclamation Facility Location
-  Proposed Development

SCALE:



**PLANNING AREA ONE
 PROPOSED FACILITIES
 BY 2025
 ST. LUCIE COUNTY, FLORIDA**

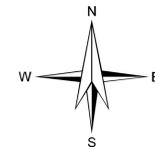




LEGEND:

-  Proposed Water Treatment Plant Location
-  Proposed Water Reclaim Facility Location
-  Planning Area Boundary
-  Proposed Development
-  St. Lucie County Boundary

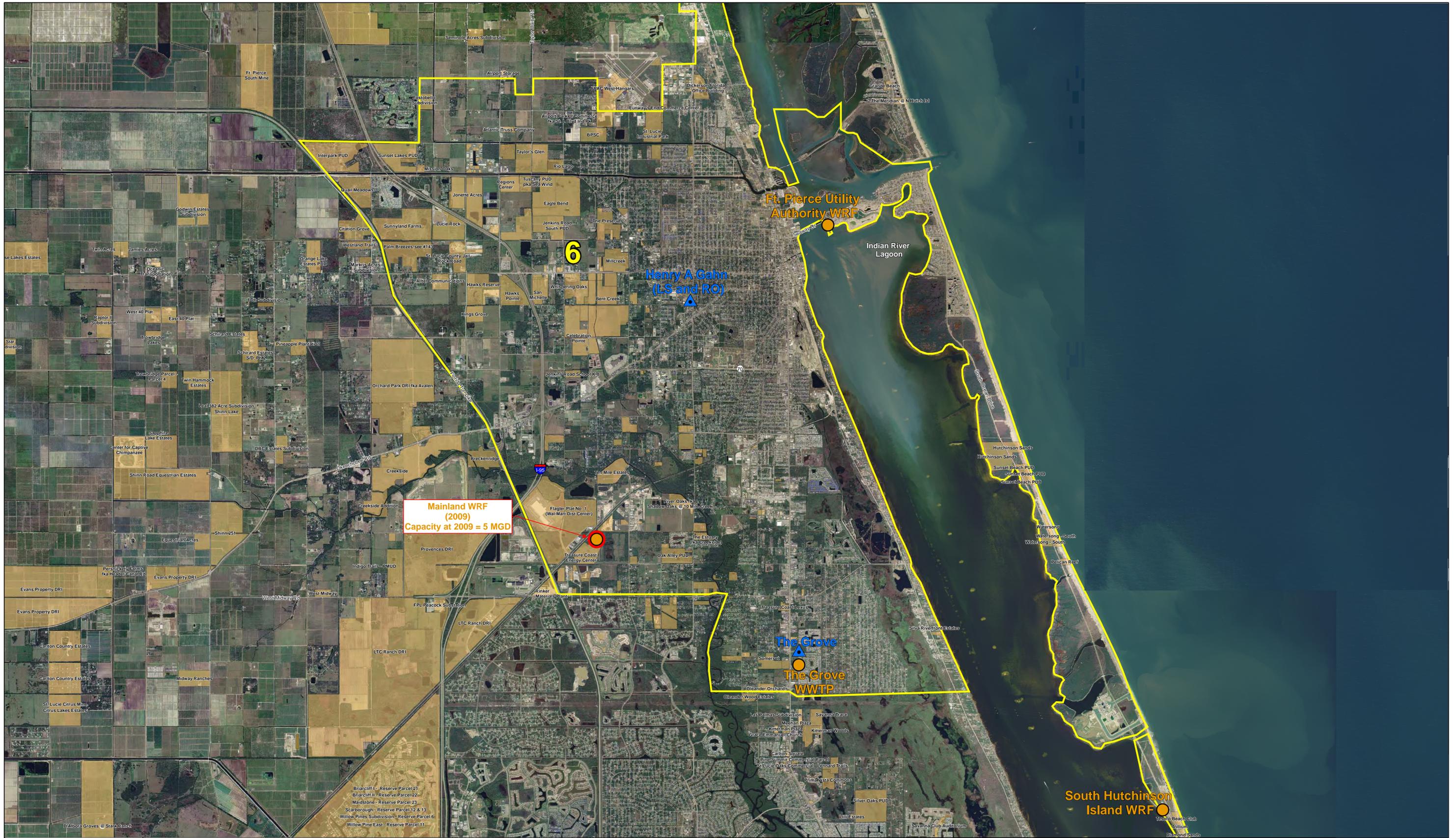
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**PLANNING AREA TWO
PROPOSED FACILITIES
BY 2015 THROUGH 2025
ST. LUCIE COUNTY, FLORIDA**



FIGURE 4.3

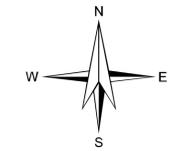


**Mainland WRF
(2009)
Capacity at 2009 = 5 MGD**

LEGEND:

-  Future Water Reclamation Facility Location (2009)
-  Water Treatment Plant Location
-  Waste Water Treatment or Water Reclamation Facility Location
-  Planning Area Boundary
-  Proposed Development
-  St. Lucie County Boundary

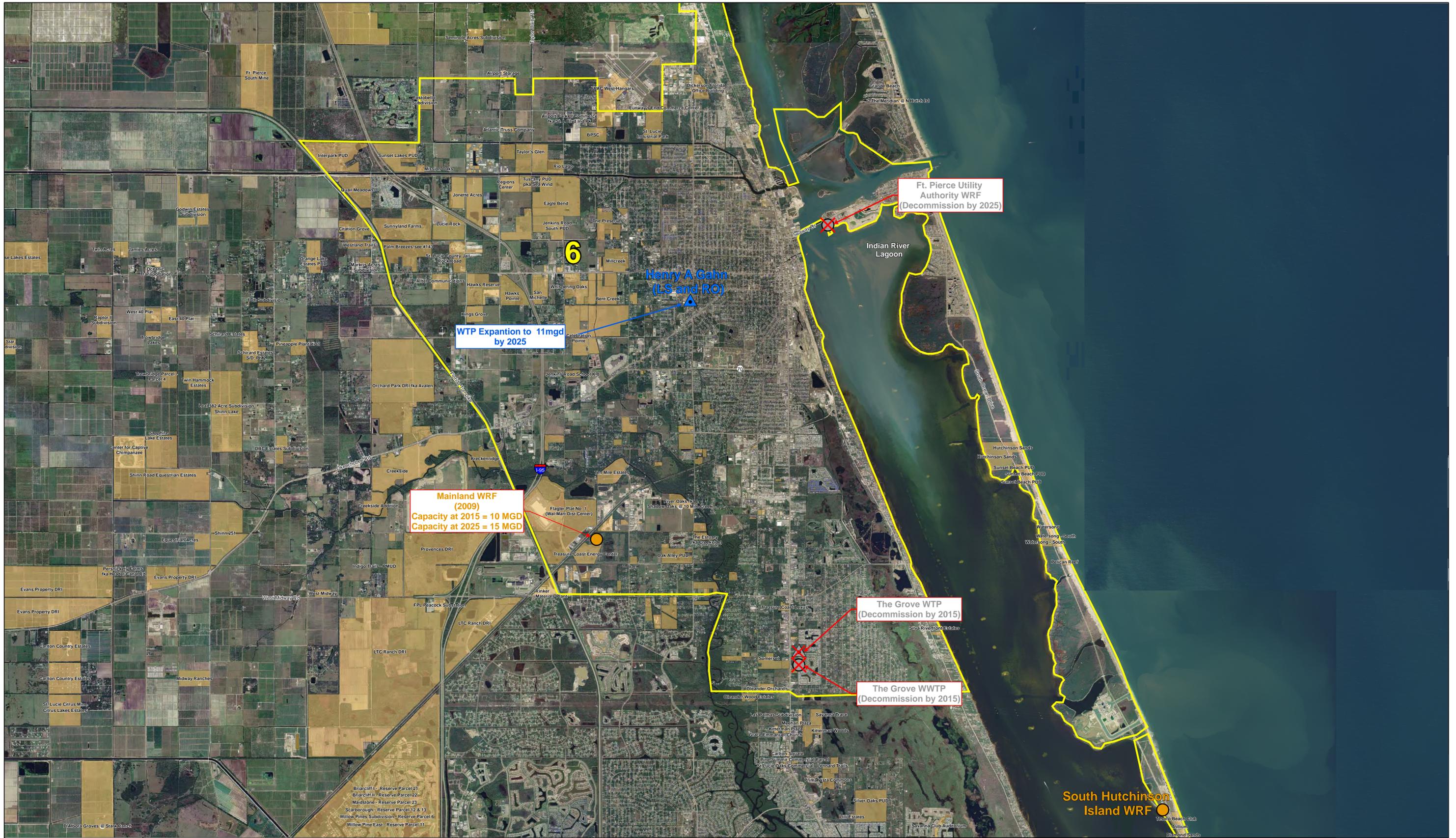
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**PLANNING AREA SIX
PROPOSED FACILITIES
THROUGH 2010
ST. LUCIE COUNTY, FLORIDA**



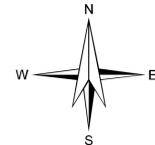
FIGURE 4.4



LEGEND:

-  Water Treatment Plant Location
-  Water Reclamation Facility Location
-  Decommission Water Treatment Plant Location
-  Decommission Water Reclamation Facility Location
-  Planning Area Boundary
-  Proposed Development
-  St. Lucie County Boundary

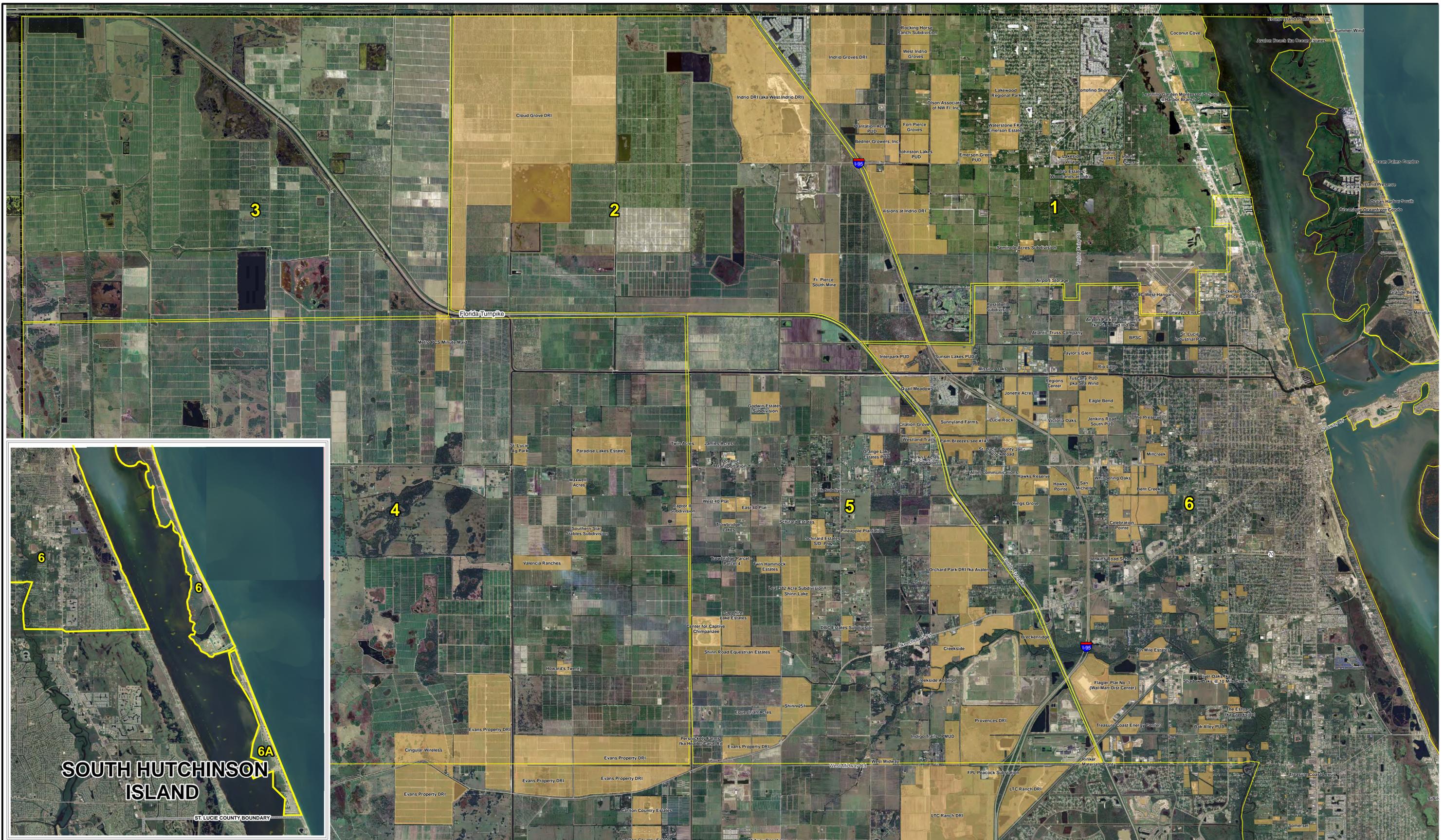
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**PLANNING AREA SIX
PROPOSED FACILITIES
THROUGH 2025
ST. LUCIE COUNTY, FLORIDA**



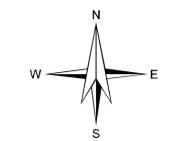
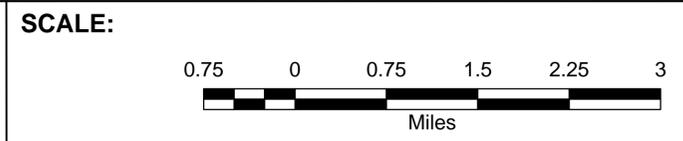
FIGURE 4.5



METCALF & EDDY | AECOM

LEGEND:
 St. Lucie County Development
 St. Lucie County Boundary

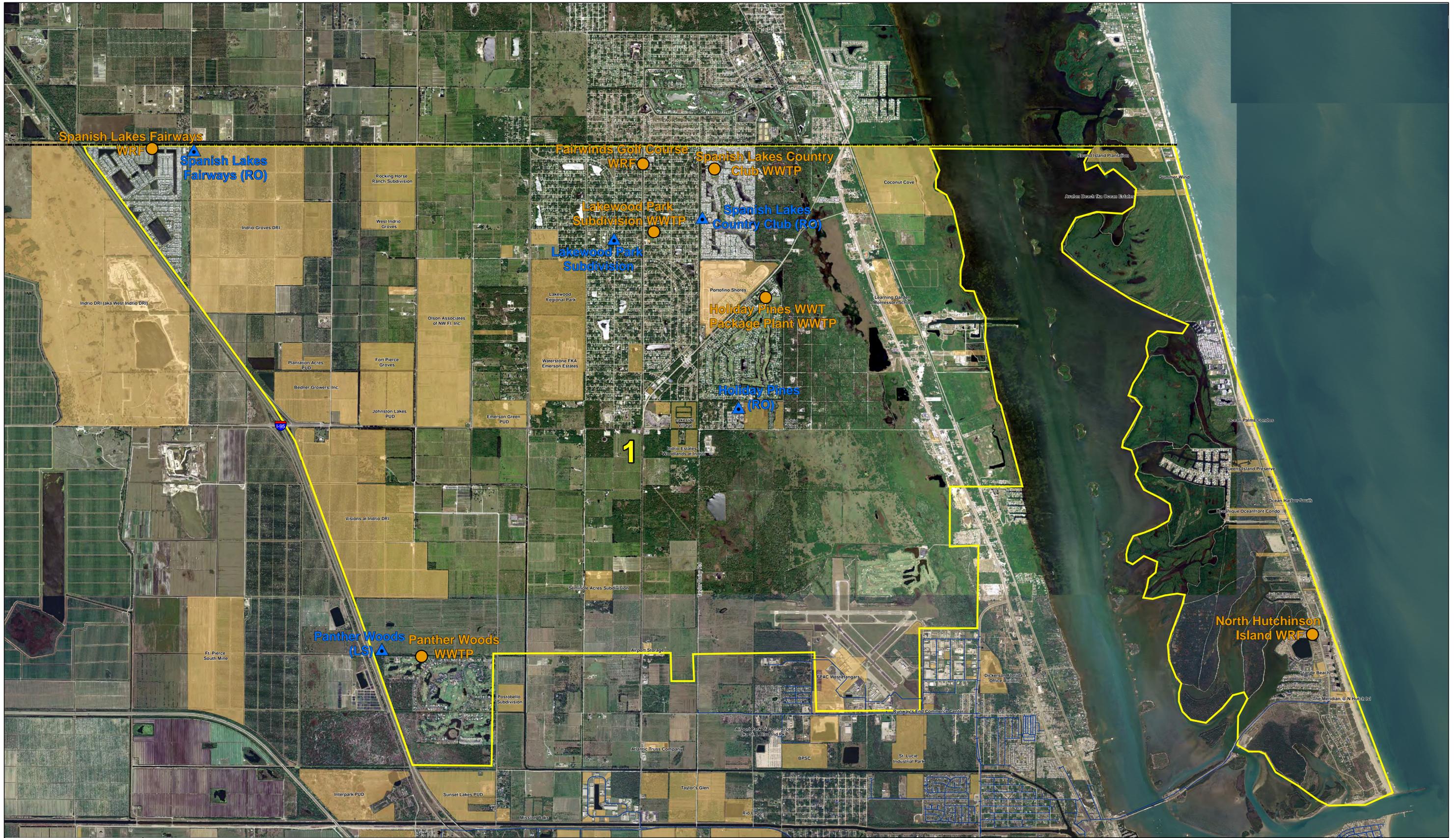
 Planning Areas



**ST LUCIE DEVELOPMENT
 PLANNING AREAS**
ST LUCIE COUNTY, FLORIDA



FIGURE 3.1

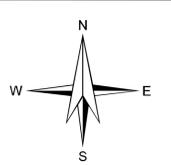
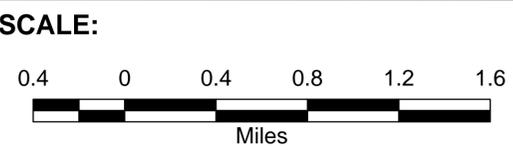


LEGEND:

-  Water Treatment Plant Location
-  Waste Water Treatment or Water Reclamation Facility Location

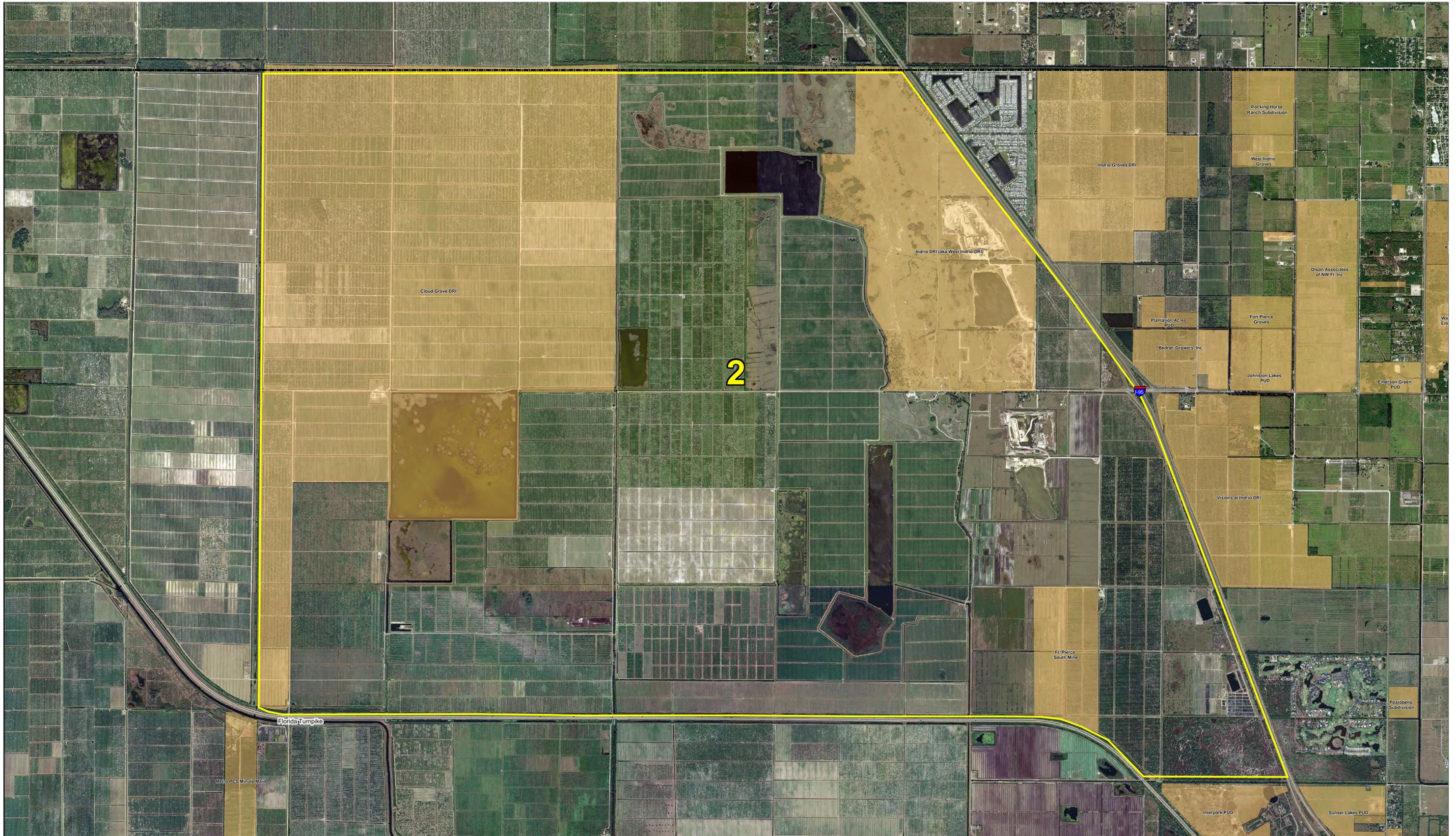
-  Planning Areas Area 1 Boundary
-  Proposed Development

-  Water Main
-  St. Lucie County Boundary



**PLANNING AREA ONE
EXISTING CONDITIONS**

ST. LUCIE COUNTY, FLORIDA



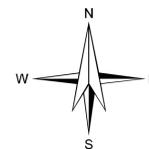
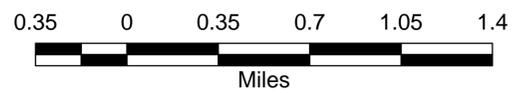
LEGEND:

 Planning Areas
Area 2 Boundary

 St. Lucie County Boundary

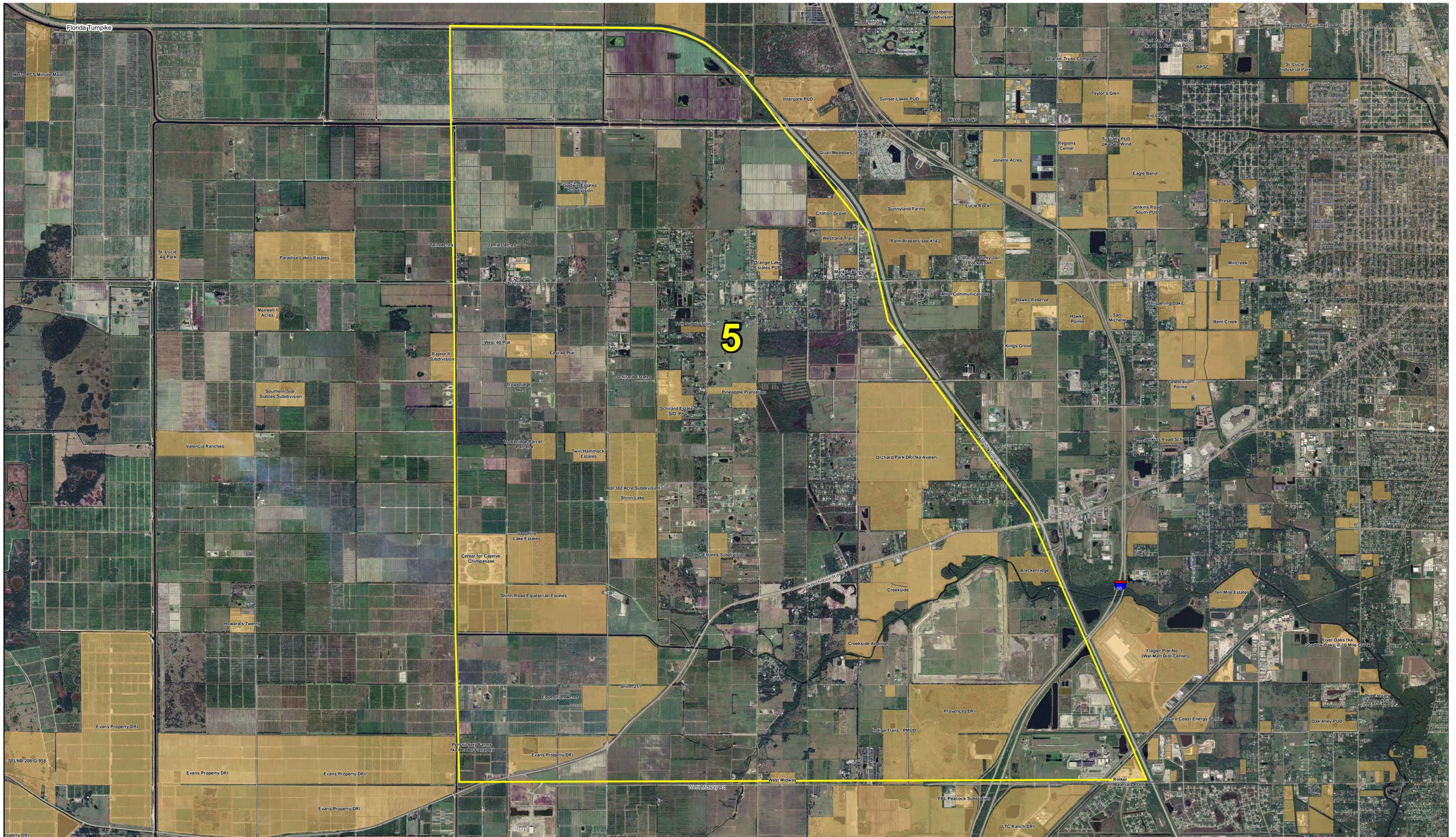
 Proposed Development

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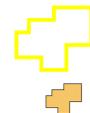


**PLANNING AREA TWO
EXISTING CONDITIONS
ST. LUCIE COUNTY, FLORIDA**





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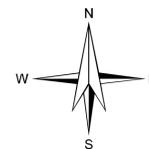
Planning Areas
Area 2 Boundary

Proposed Development



St. Lucie County Boundary

SCALE:

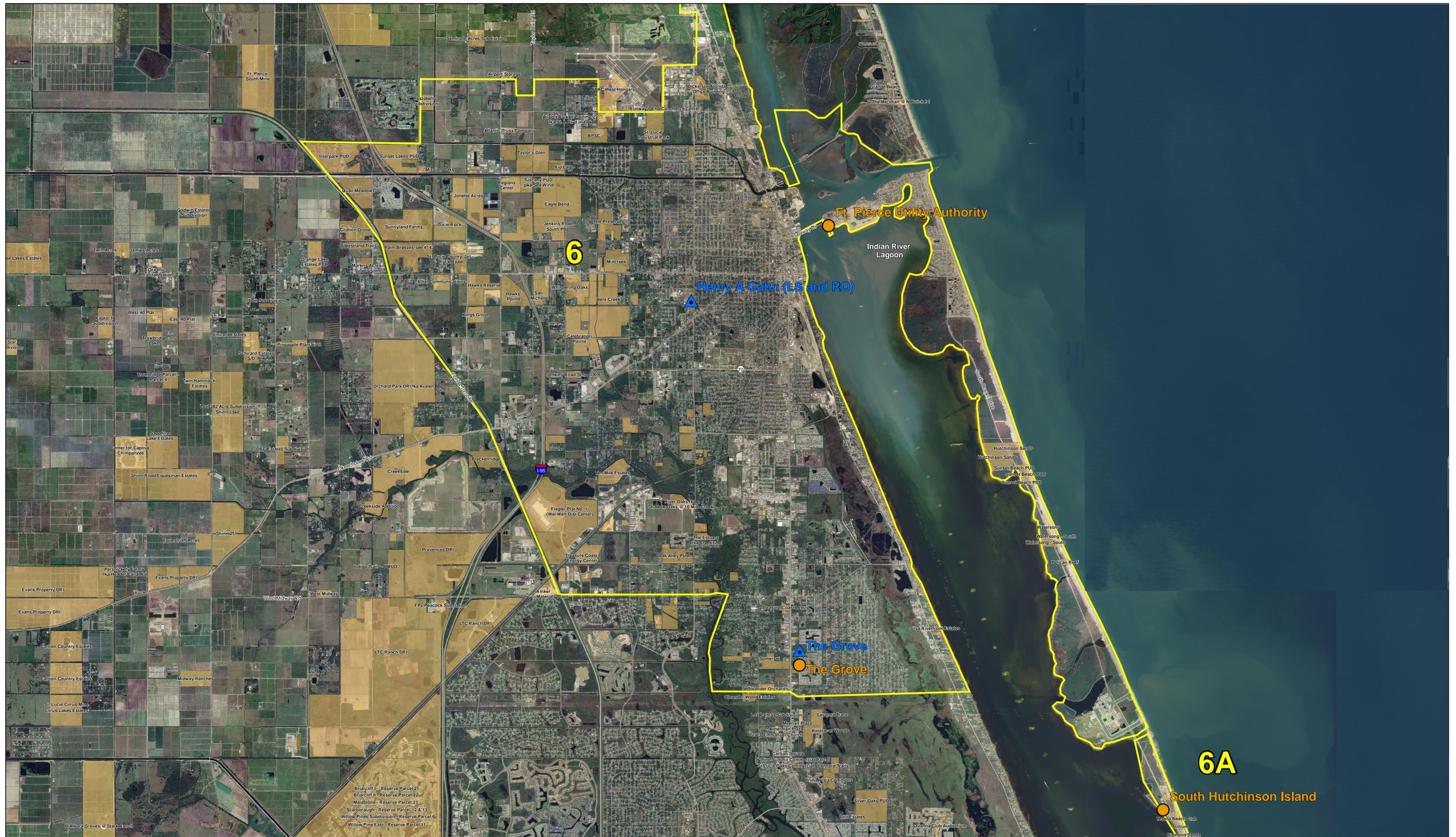


**PLANNING AREA FIVE
EXISTING CONDITIONS**

ST. LUCIE COUNTY, FLORIDA



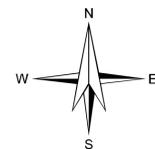
FIGURE 3.4



LEGEND:

- ▲ Water Treatment Plant Location
- Waste Water Treatment or Water Reclamation Facility Location
- Planning Area Boundary
- Proposed Development
- St. Lucie County Boundary

SCALE:



**PLANNING AREA 6 & 6A
EXISTING CONDITIONS
ST. LUCIE COUNTY, FLORIDA**



FIGURE 3.5