



FLORIDA WATER UTILITIES DRIVE INNOVATIVE ALTERNATIVE WATER SUPPLY OPTIONS

**28th Annual Environmental
Permitting Summer School**
Marco Island

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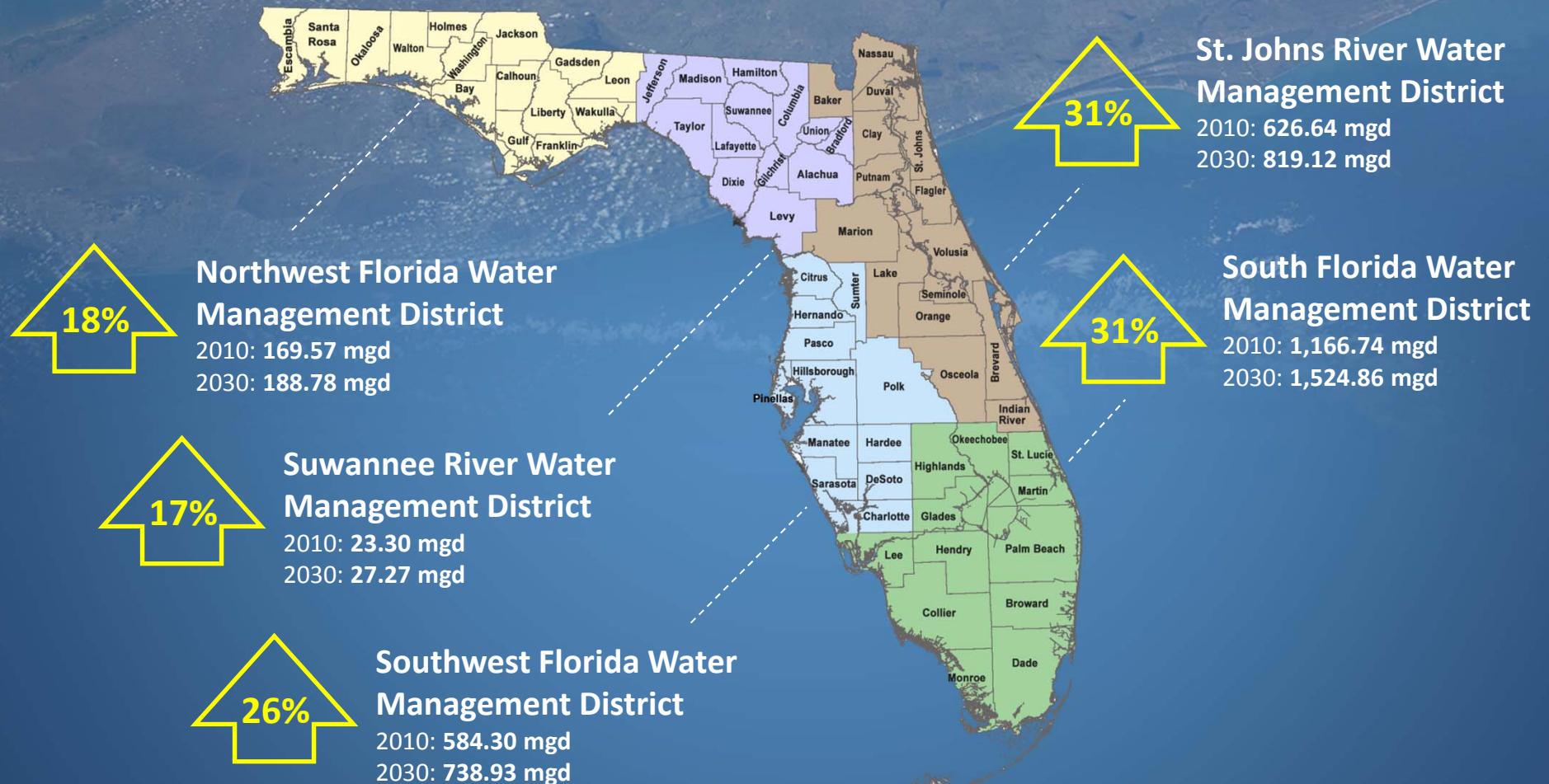
July 23, 2014

An aerial photograph of a coastal region, showing a mix of blue water, sandy beaches, and green land. The image is used as a background for the text.

FLORIDA WATER UTILITIES ARE ADDRESSING ALTERNATIVE WATER SUPPLY NEEDS WITH INNOVATIVE PROJECTS

- By 2030, demand for fresh water in Florida is estimated to increase by about 1.3 billion gallons per day (bgd) for a total of 7.7 bgd. Traditional sources of fresh groundwater will not be able to meet all of the additional demand.
- Water Management District Regional Water Supply Plans have identified shortfalls in traditional groundwater and existing regional surface water supplies
- Ongoing Minimum Flows and Level (MFL) development, pumping drawdowns, CERP and saltwater intrusion are all drivers for alternative water supply projects
- Utilities have been responding with a number of innovative alternative water supply projects

FDEP REGIONAL WATER SUPPLY PLANNING ANNUAL STATUS REPORTS HAVE IDENTIFIED PUBLIC WATER SUPPLY SHORTFALLS

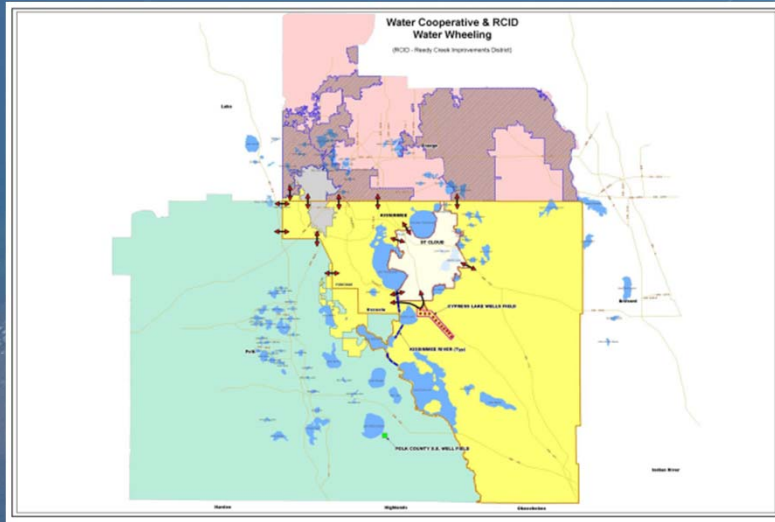


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UTILITIES ARE RESPONDING WITH A VARIETY OF INNOVATIVE ALTERNATIVE WATER SUPPLY PROJECTS

- Saltwater and Brackish Water - STOPR Group and Hallandale
- Water Reuse - Altamonte Springs, Reedy Creek Improvement District and Broward / Palm Beach County Joint Project
- Surface Water Captured Predominately During Heavy Rainfalls - West Palm Beach
- Sources Made Available Through the Addition of New Storage Capacity - Palm Beach and Broward Counties C-51 Reservoir
- Aquifer Storage and Recovery - Polk County and West Palm Beach

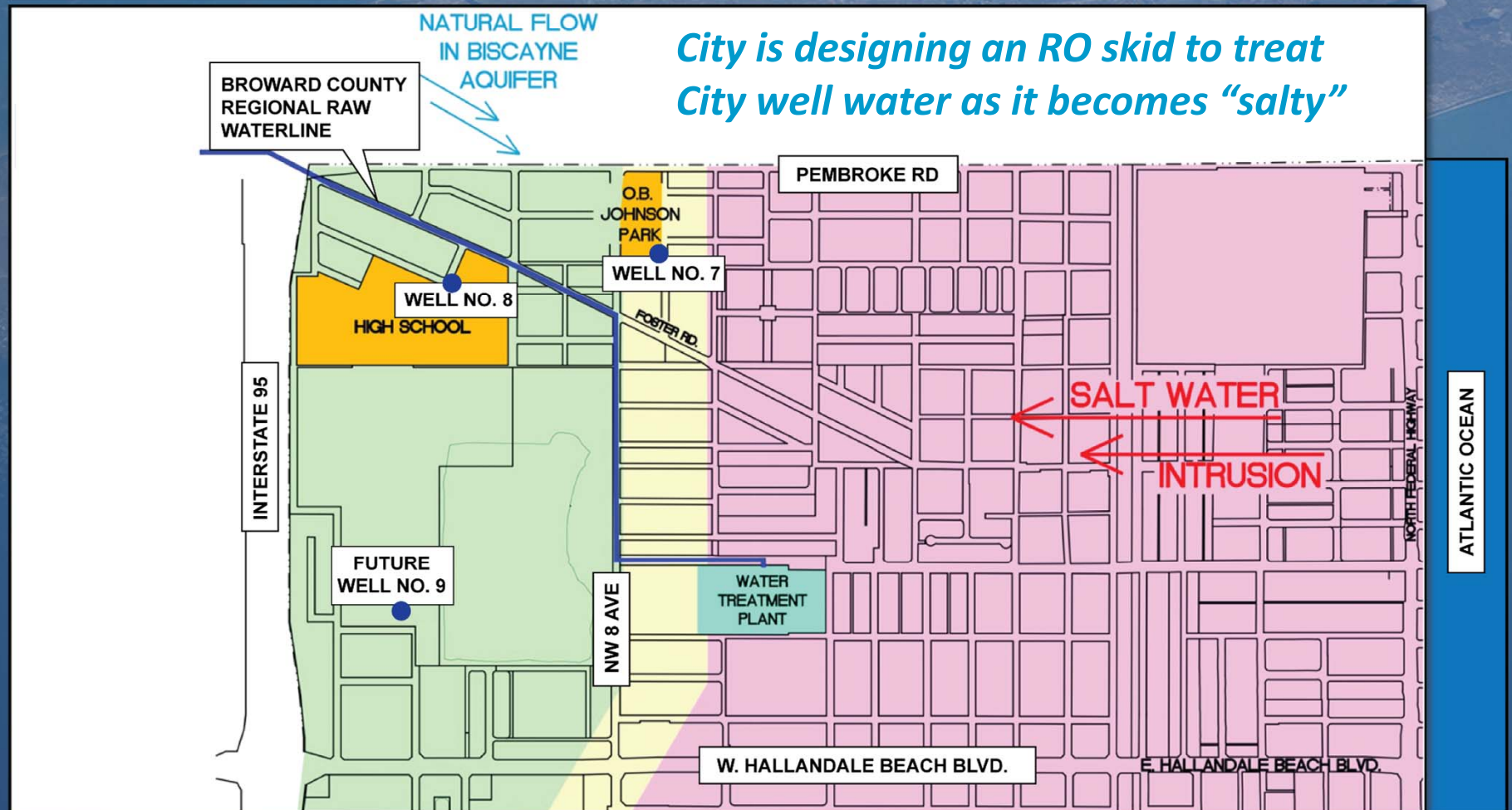
BRACKISH WATER STOPR Cypress Lake Project



- Lower Floridan brackish groundwater source
- “Water Cooperative of Central Florida” Interlocal Agreement and Charter has been executed with STOPR members including City of St Cloud, Toho Water Authority, Orange County and Polk County
- Permitted 37.5 MGD groundwater withdrawal with 30 MGD of finished water under distribution “water wheeling” scheme for STOPR members
- SFWMD has agreed to provide \$465,000 to satisfy a settlement agreement between St. Cloud and Orange County.

BRACKISH WATER

The City of Hallandale Beach is planning for future “salty” City wells



WATER REUSE

Altamonte-FDOT Integrated Reuse & Stormwater Treatment An Integrated Approach to Reuse and Nutrient Reduction



Project Components

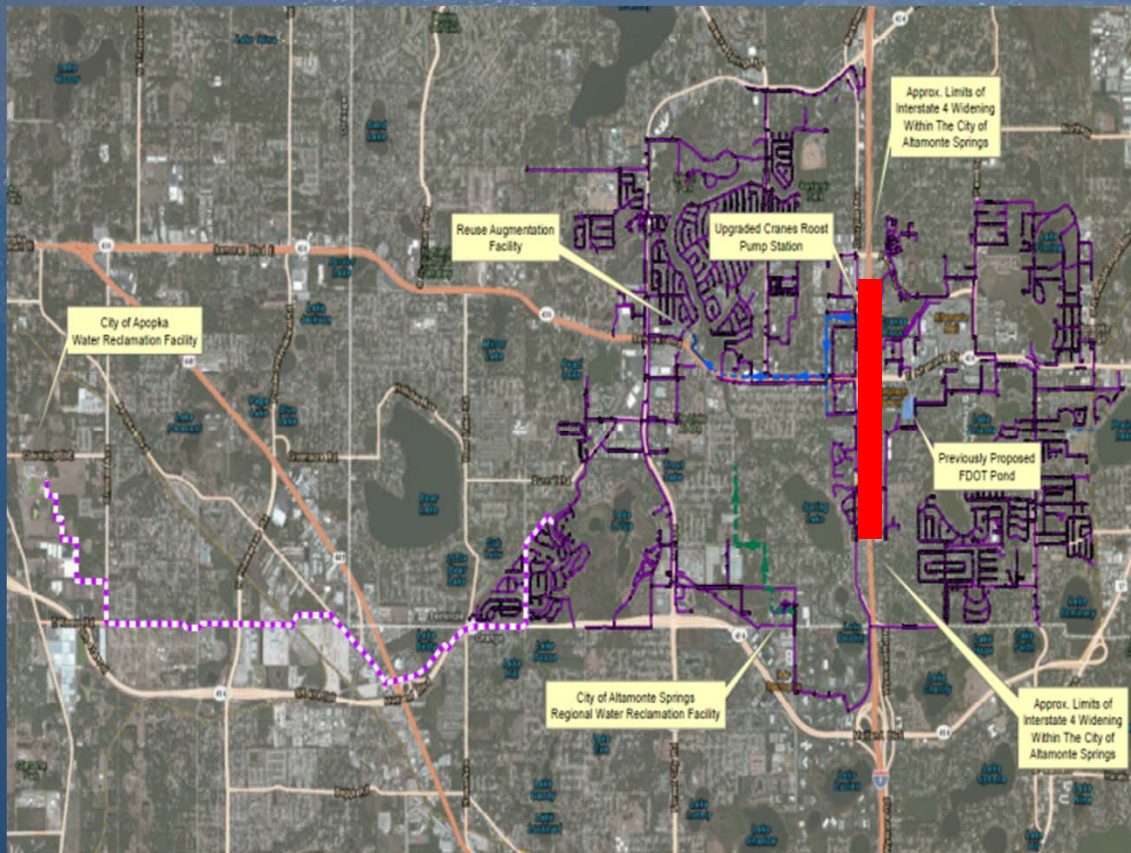
- Stormwater from I-4 widening diverted to City's Cranes Roost reservoir
- 1.5 mgd from Cranes Roost pumped to Reuse Augmentation Facility
- Stormwater and reclaimed water not reused by Altamonte delivered via 5 mile pipeline to City of Apopka for irrigation and groundwater recharge.

WATER REUSE

Altamonte-FDOT Integrated Reuse & Stormwater Treatment An Integrated Approach to Reuse and Nutrient Reduction

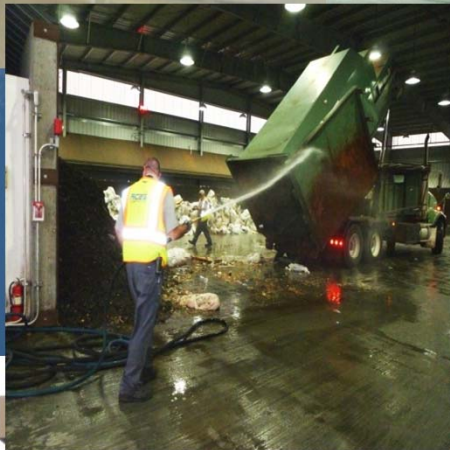
Benefits:

- Reduction of nutrients discharged to Wekiva River Basin from stormwater and reclaimed water wet weather flows
- Provides 1.5 MGD of Alternate Water Supply from Cranes Roost stormwater
- Provides 3.0 MGD of Alternate Water Supply from RWRf (previous wet weather discharge)



WATER REUSE

Reedy Creek Improvement District is
Driving Innovative Uses for Reuse



- Cooling tower makeup
- Street and sidewalk wash-down
- Fire protection and suppression
- Vehicle washing
- Toilet Flushing
- Process uses (WWTP & Solid Waste Transfer Station)

WATER REUSE

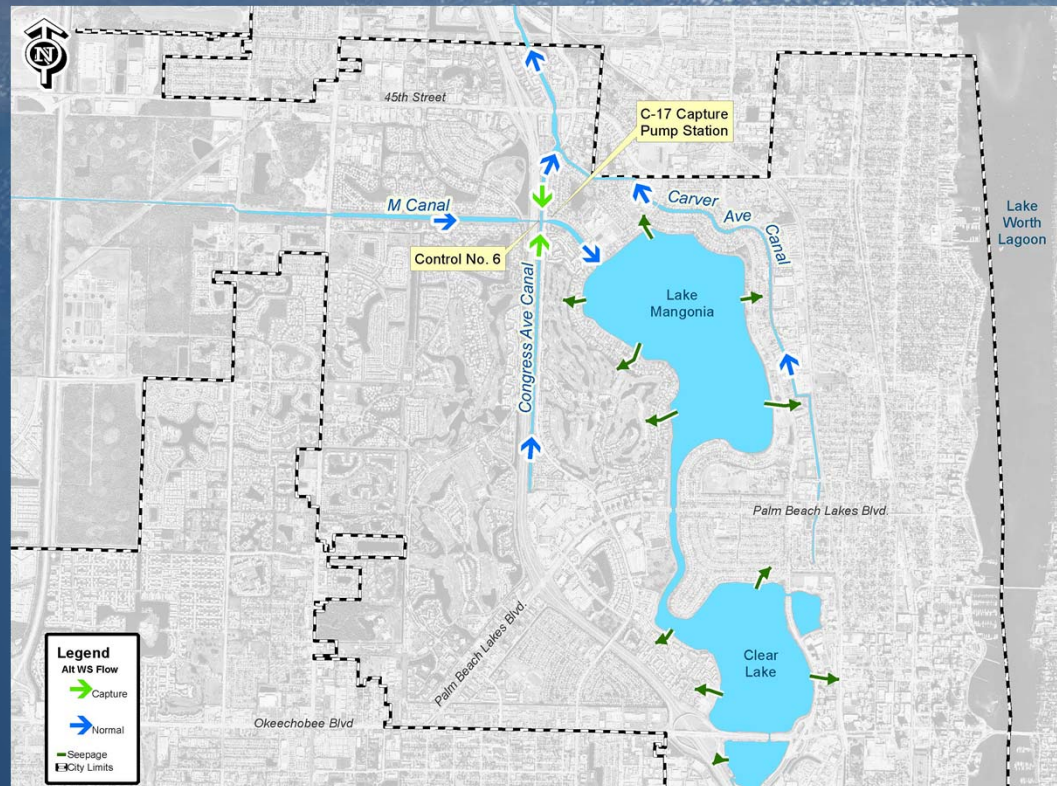
Broward County will provide Reclaimed Water to Palm Beach County



- Broward County - Ocean Outfall compliance
- Palm Beach County – Alternative Water Supply
- 6.5 mgd designated to southern Palm Beach County customers
- 12.3 mgd reserved for other/future Palm Beach County customers
- 4.8 mgd will be delivered to northern Broward County customers en route to Palm Beach County

SURFACE WATER CAPTURED PREDOMINATELY DURING HEAVY RAINFALLS

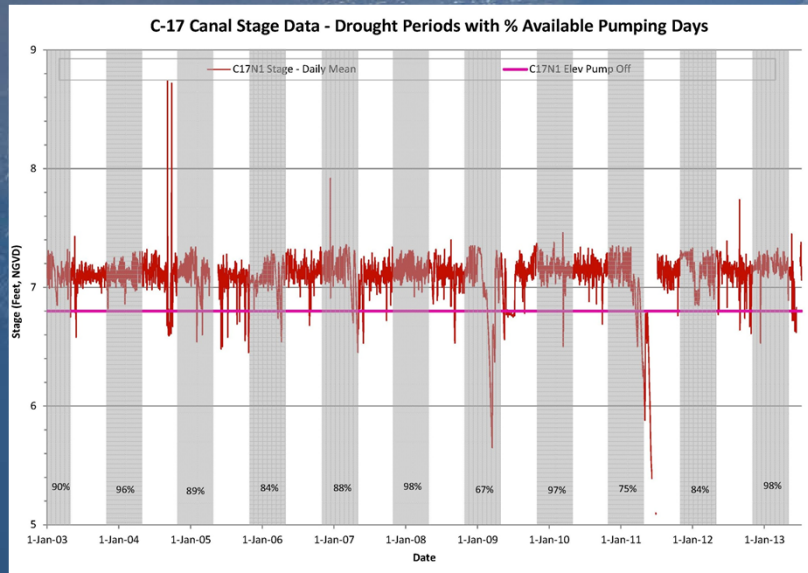
City of West Palm Beach C-17 Tidal Capture Project Description



- Re-captures seepage from lake system and water catchment area otherwise lost to tide
- Capacity to capture up to 60 mgd
- Proven: City captured 2.3 billion gallons from October 2011 to June 2012 (dry season)
- Low cost: Capital cost \$0.07 / 1,000 gallons
- Annual O&M cost \$0.04 / 1,000 gallons
- Companion to Renaissance C-51 Tidal Capture Project

SURFACE WATER CAPTURED PREDOMINATELY DURING HEAVY RAINFALLS

City of West Palm Beach C-17 Tidal Capture Project Benefits

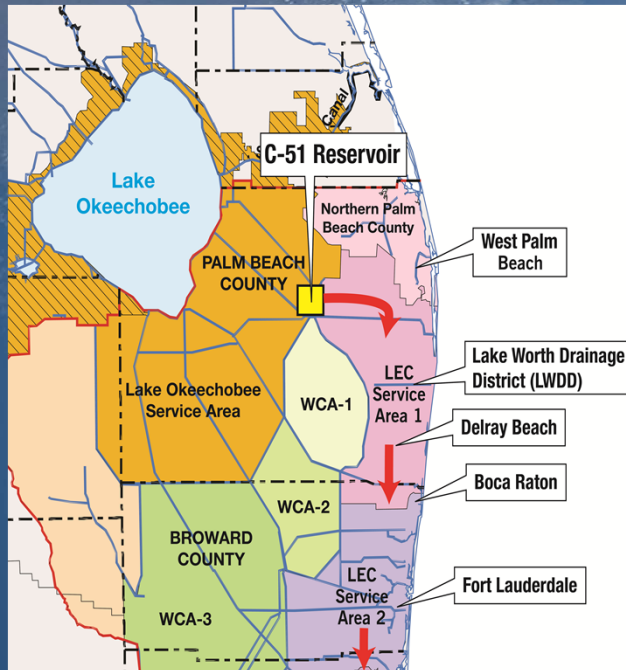


Shaded area represents the dry season for each year.

- Maximizes potential to capture rainfall 24/7 including during droughts – water historically available 88% of time during typical dry season
- Water captured is over and above consumptive use permit allocation
- Reduces harmful water discharges to Lake Worth Lagoon

SOURCES MADE AVAILABLE THROUGH THE ADDITION OF NEW STORAGE CAPACITY

Stormwater from C-51 Canal stored to recharge aquifer providing water supply to multiple utilities



- Partnership among south Florida utilities, Palm Beach Aggregates and SFWMD - Public-Private Partnership (P3)
- Land areas with slow seepage characteristics provide rare water storage opportunity.
- Water routed through SFWMD's Regional System
- Utilities from Palm Beach to Miami-Dade counties may potentially benefit

SOURCES MADE AVAILABLE THROUGH THE ADDITION OF NEW STORAGE CAPACITY

C-51 Reservoir Addresses Florida's Unique Water Supply and Storage Challenges

- Cost-effective - existing groundwater wells and treatment plants made used and useful by permit offsets
- Current design can provide 132.5 mgd during dry season
- Project beneficially uses rock-mined land.
- Project ties need for additional water supply with ecosystem restoration.
 - Can mitigate salt water intrusion from sea level rise;
 - Will reduce harmful water discharges to Lake Worth Lagoon by 17%

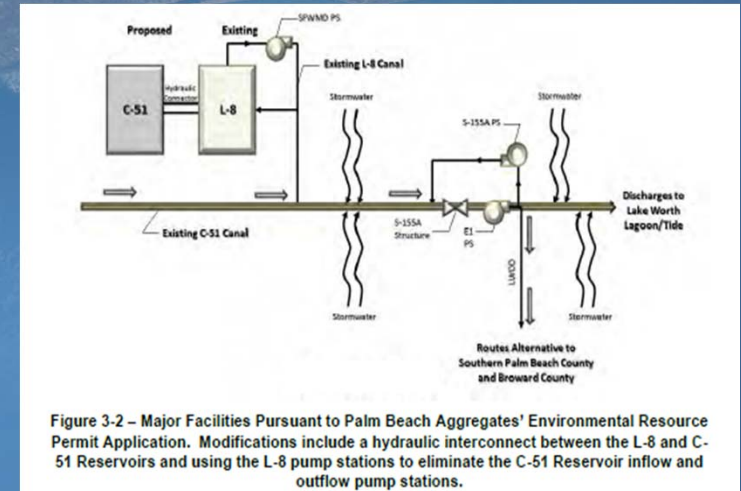


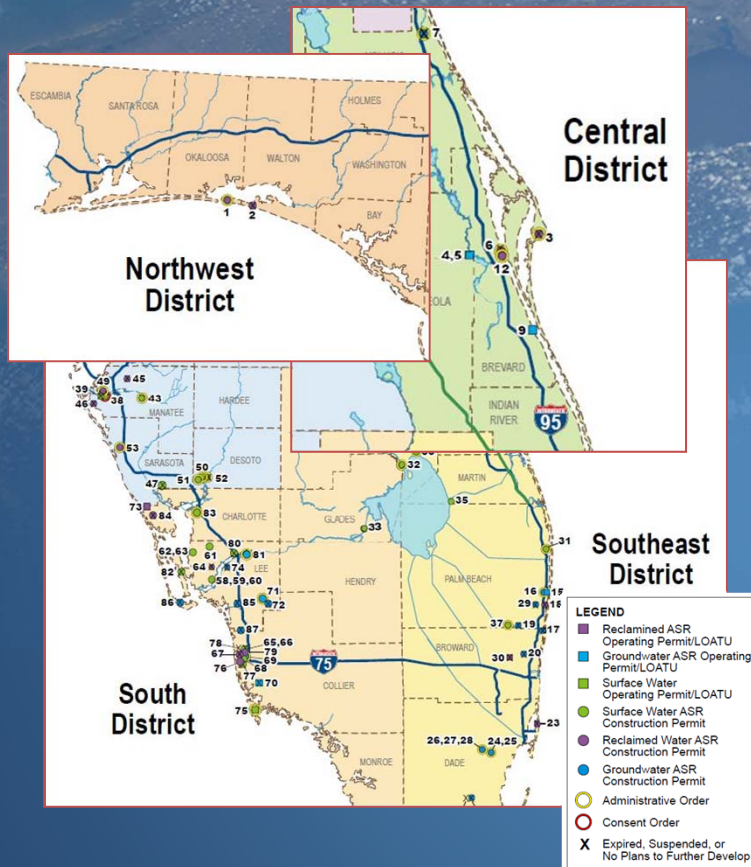
Figure 3-2 – Major Facilities Pursuant to Palm Beach Aggregates' Environmental Resource Permit Application. Modifications include a hydraulic interconnect between the L-8 and C-51 Reservoirs and using the L-8 pump stations to eliminate the C-51 Reservoir inflow and outflow pump stations.

AQUIFER STORAGE AND RECOVERY

2011 to 2014

What a Difference

Three Years Makes



- EPA letter supporting FDEP's position on the arsenic issue
- Storage of reclaimed water is expanding in Southwest and Central Florida
- Untreated surface water ASR is moving forward in South Florida
- New storage zones are being explored, particularly in the lower Floridan aquifer
- Several projects previously "shelved" have been re-activated

AQUIFER STORAGE AND RECOVERY

Reclaimed Water ASR



- Used to store public access reclaimed water and provide dry season supplemental supply
- Most practical and economically feasible in aquifers containing greater than 1,000 mg/L TDS
- Can minimize surface water discharges, nutrient limits, and TMDL reductions
- Polk County Recently Constructed the Deepest ASR Well Worldwide
- First ASR well to utilize the lower Floridan aquifer (LFA)
- Others, such as St. Cloud, are pursuing similar opportunities

AQUIFER STORAGE AND RECOVERY

Untreated Surface Water or Stormwater ASR



- Most cost-effective storage option
- Greenest option w/ lowest carbon footprint
- Requires Water Quality Criteria Exemption (WQCE) or other relief mechanism
- Drainage wells (Orlando, Gainesville) provide good historical dataset
- The City of West Palm Beach is pursuing a WQCE to allow total coliform to enter well
 - *Preliminary feedback from FDEP is encouraging*

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Questions?

