WATER CONSERV II

SETS THE STANDARD FOR REUSE PROJECTS IN THE NORTHEAST

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History of Water Reuse in America

Chronology of State Regulatory Guidance

- 1983 – Florida *"Land Application of Domestic Wastewater Effluent in Florida"*
- 1986 – Arizona *"Arizona Environmental Quality Act"*
- 1990 – Texas *"Administrative Code Chapter 310"*
- 1991 – California *"Water Recycling Act"*
- 1992
  - Washington *"Reclaimed Water Act"*
  - *EPA "Guidelines for Water Reuse"*
- 2000s – Many states follow…

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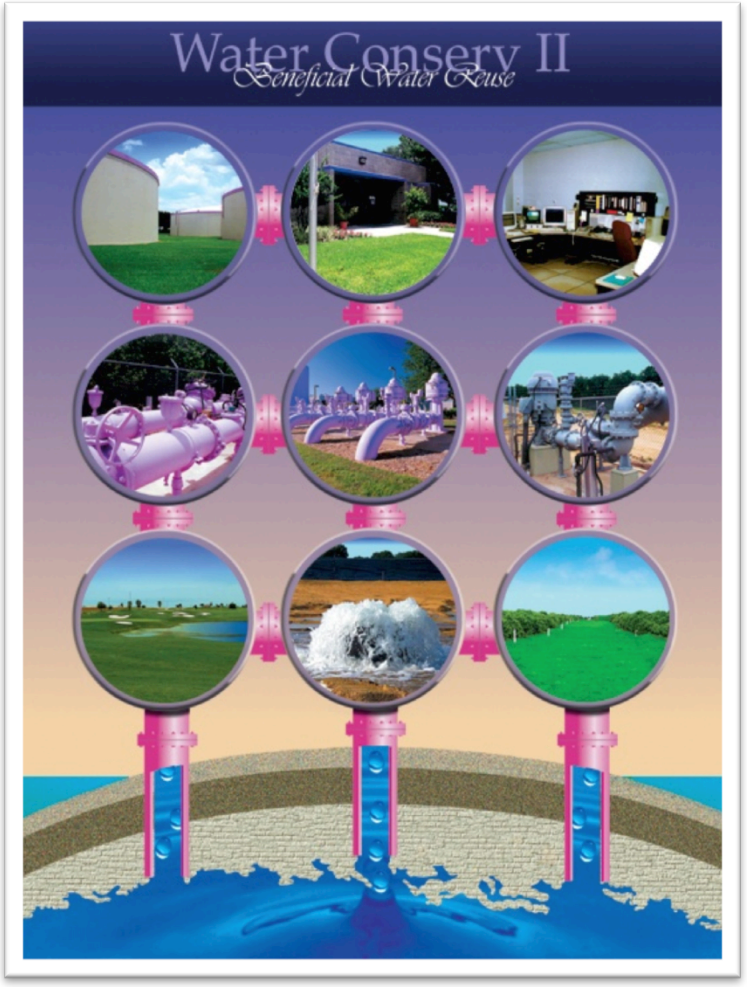
History of Water Reuse in Florida

- 1960s – Agricultural water reuse in Tallahassee
- 1970s – Landscape irrigation in St. Petersburg
- 1983 – Landmark year for reuse in Florida
  - Water Conserv II construction begins
  - Florida DEP: *Land Application of Domestic Wastewater Effluent in Florida*
- 1986 – Florida DEP creates Water Reuse Program
- 1989 – Reuse becomes State “objective” (i.e. mandatory)

About Water Conserv II

Water Conserv II was the ***largest water reclamation project in the world***. It combines agricultural irrigation & Rapid Infiltration Basins (RIBs)



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First Reuse Project in Florida

The first reuse project in Florida permitted by the Florida Department of Environmental Protection to irrigate crops for human consumption with reclaimed water

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Project Designed

Project Designed for Average Flow of 50 MGD
& Can Handle Peak Flows up to 75 MGD

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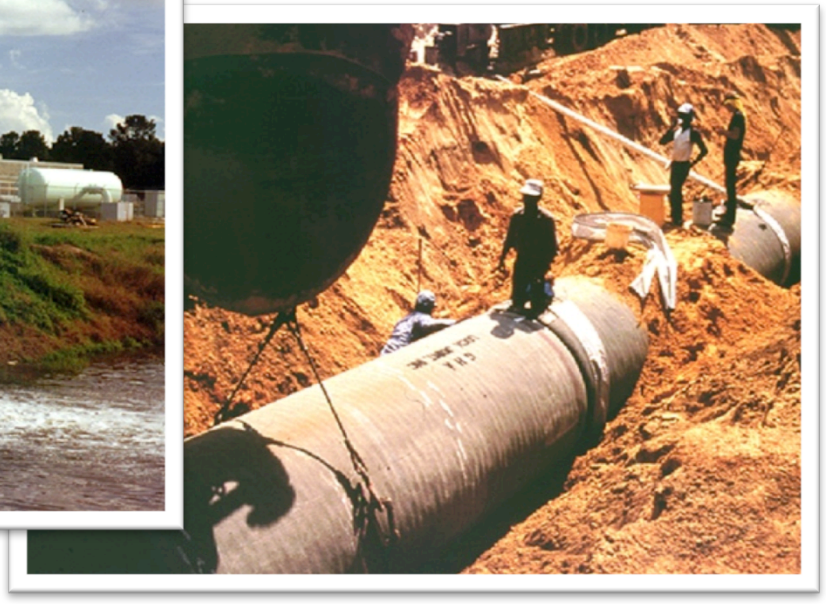
Water Conserv II History

- 1979 - Cease Discharge to Shingle Creek by March 1988
- Alternatives Investigated
- 1983 - Construction Started



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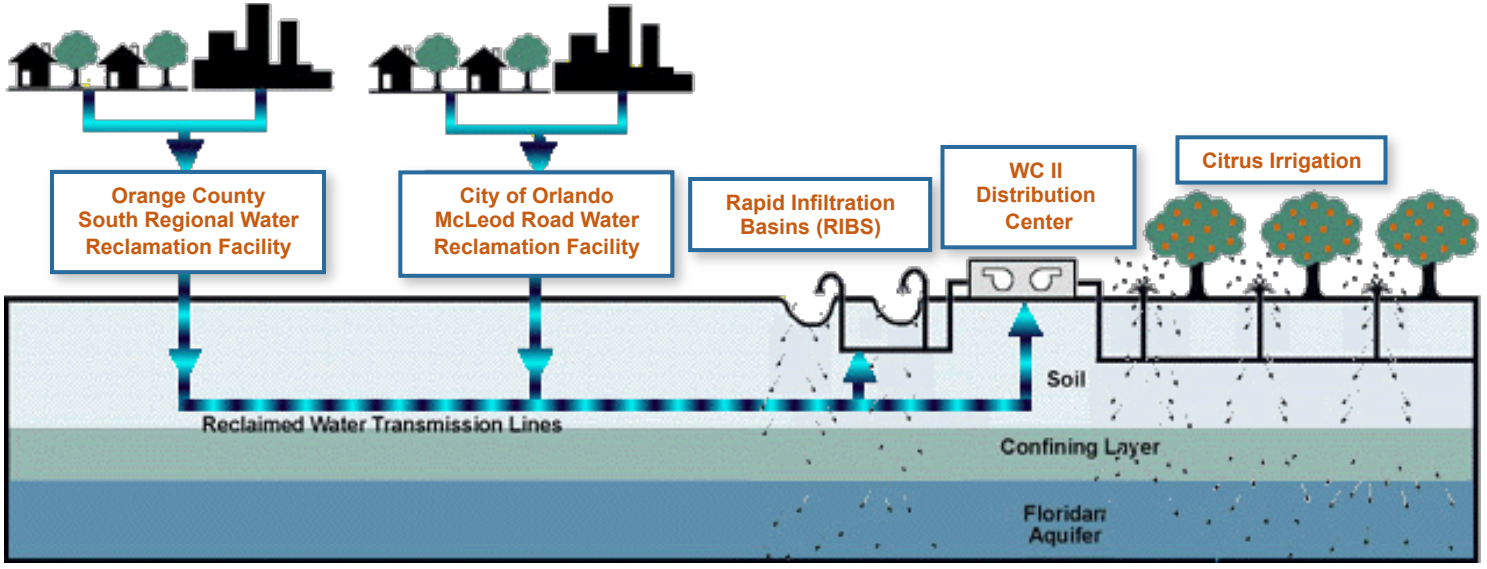
Water Conserv II History

- June 1986 – System Start-Up & Testing Began
- December 1, 1986 – Operations Began
- March 1987 – Ceased Shingle Creek Discharge
- Water Conserv II Known as the “Project of Two’s”



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1986 vs 2012

December 1986

- 10 Citrus Growers
- 18 Turnouts
- 13.79 MGD Average Flow
- 15.88 MGD RIB Capacity

2012

- 68 Customers
- 54 Turnouts
- 30 MGD Average Flow
- 29.2 MGD RIB Capacity

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Water Conserv II Customers

- ~2,750 Acres of Citrus
- 3 Municipal Entities for Residential Irrigation
- 8 Foliage & Landscape Nurseries
- 2 Ferneries
- 4 Tree Farms
- 3 Golf Courses
- An Equestrian Center
- 2 Landfills

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Normal Day to Day Operations

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Normal Day to Day RIB Operations

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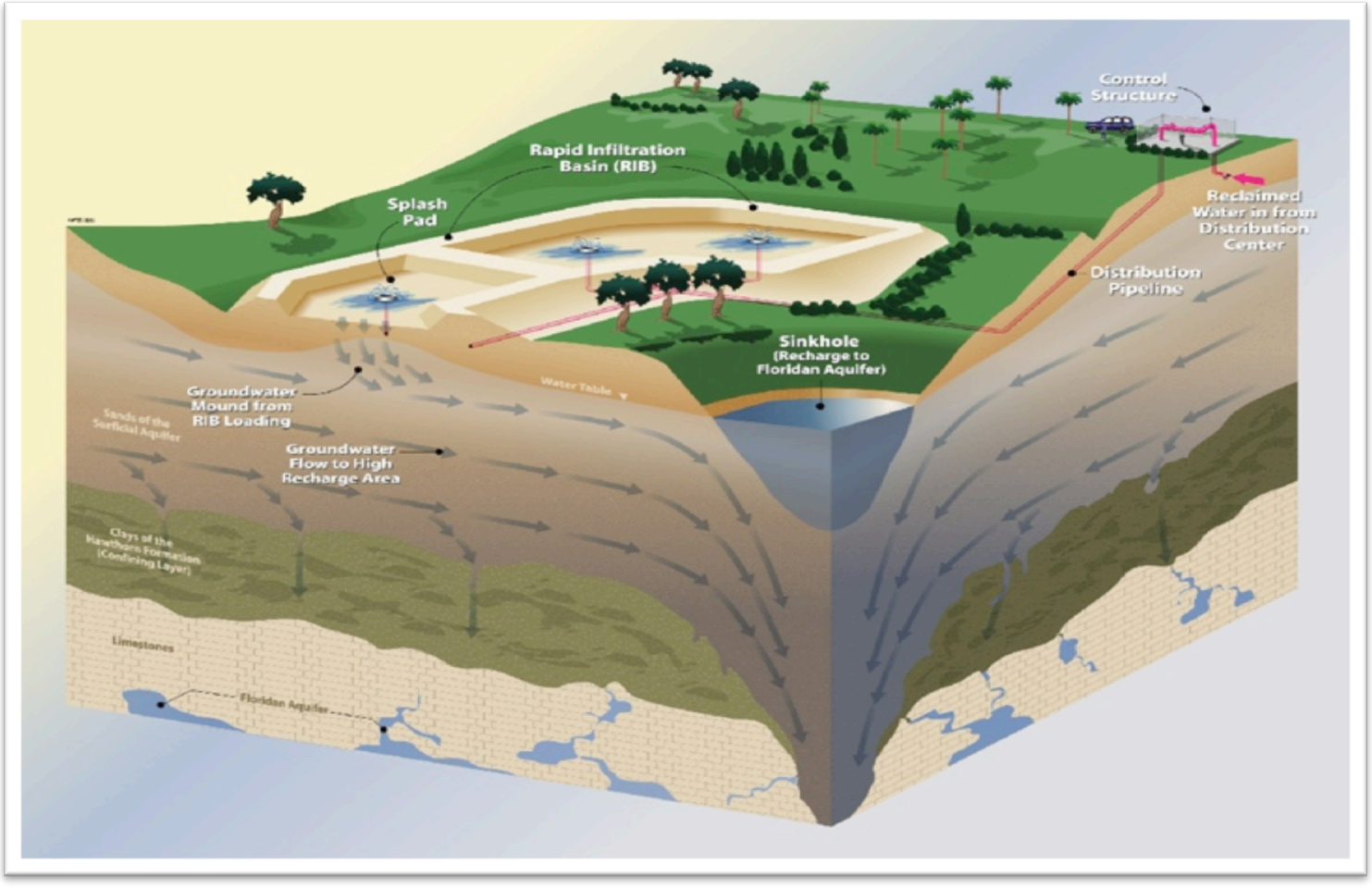
Water Conserv II

BENEFICIAL WATER REUSE



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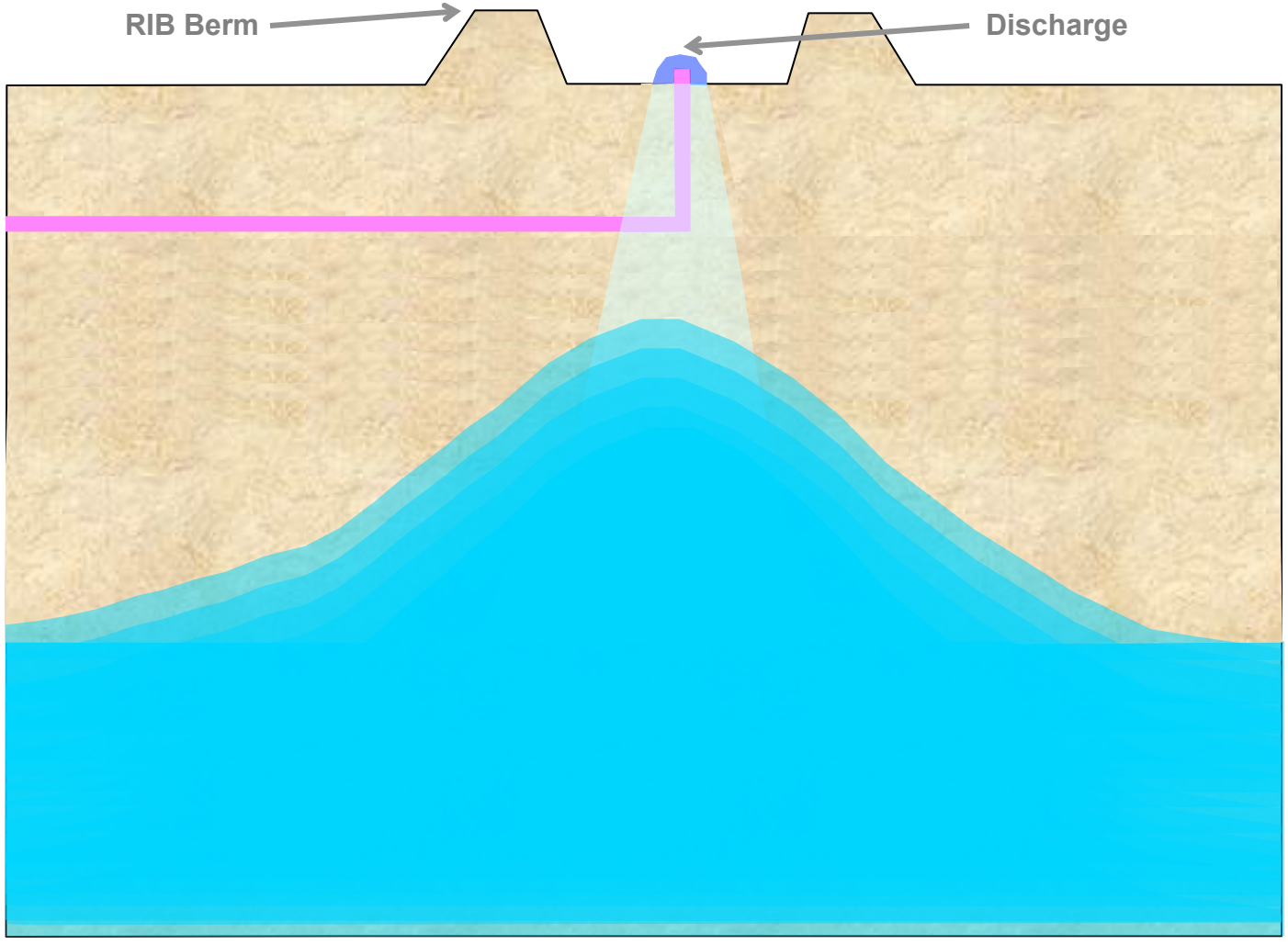
RIB Loading Cycles



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Operations During Wet Weather

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Operations During

DROUGHT AND FREEZE CONDITIONS

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Ground Water Quality Monitoring

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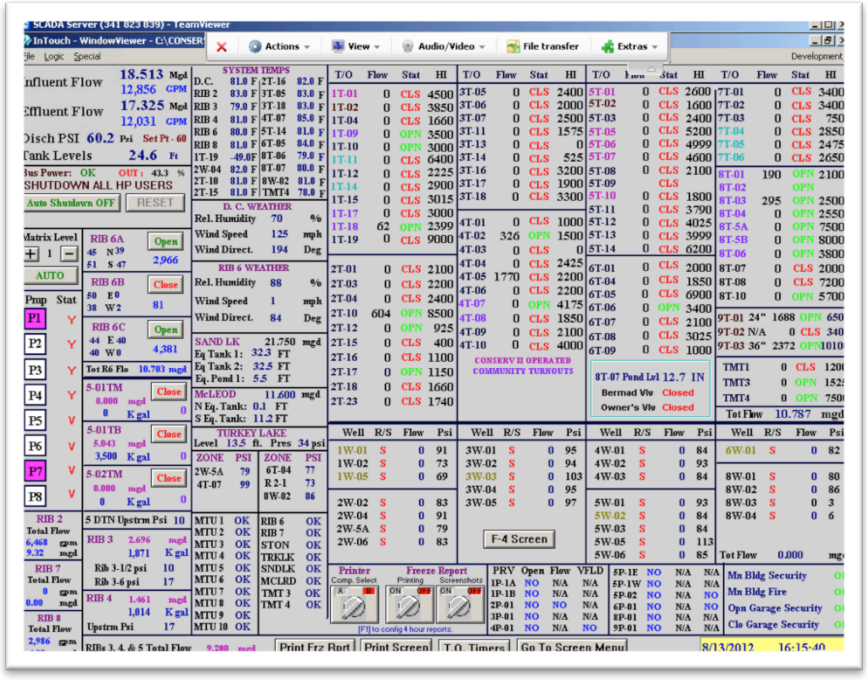
SCADA System

- Monitor & Control Customer & RIB Flows.
- Operate & Monitor Supplemental Wells
- Monitor Weather Conditions



Environmental Benefits Realized

BY WATER CONSERV II

- Eliminated discharge to surface waters
- Turned a liability into an asset for beneficial use
- Proven, beneficial & cost effective year-round reclaimed water reuse
- Reduced the demand on the Floridan aquifer by eliminating the need for well water for irrigation
- Helps to replenish the Floridan aquifer through the discharge of reclaimed water to the RIB's

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Protection of Environmentally

THREATENED, ENDANGERED & CONCERNED SPECIES

Scrub Plum

Clasping Warea

Lewton's Milkwort

Sand Spike Moss

Scrub Morning Glory

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Protection of Environmentally

THREATENED, ENDANGERED & CONCERNED SPECIES

Gopher Tortoise

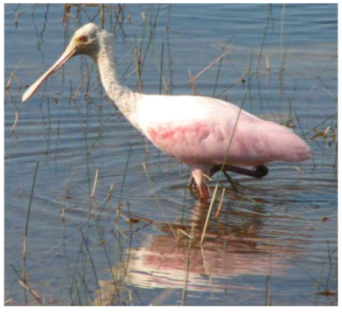
Sherman's Fox Squirrel

Eastern Indigo Snake

Sand Skink

Sandhill Crane

Roseate Spoonbill



Northern River Otter

Great Horned Owl

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Benefits to the

AGRICULTURAL COMMUNITY

- A dependable long term source of irrigation
- Elimination of installation, operation & maintenance costs for deep well water pumping systems
- Better tree growth and increased crop yield
- Enhanced freeze protection
- Detailed research at the Mid-Florida Citrus Foundation

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Benefits of Water Conserv II

PROGRAM TO THE COMMUNITY

Recreational Areas

Meeting Facility

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Orange County

NATIONAL GOLF CENTER

- 1990 - Orange County and City of Orlando Began to Look at Options
- 1993 - Negotiations Began
- October 1996 - Construction Began
- March 1997 – 42-Acre Practice Facility Opened

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Orange County

NATIONAL GOLF CENTER

- **September 1997 to December 1998 –** Course Play Began
- **January 1999 –** The Clubhouse & the Golf Institute Facilities Opened
- **March 2012 –** Facilities were purchased by Celebration Golf Management, LLC and renamed Orange County National Club, LLC.

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Orange County

NATIONAL GOLF CENTER

An Average of 2.42 MGD of Reclaimed Water was used for Irrigation During the last 12 months

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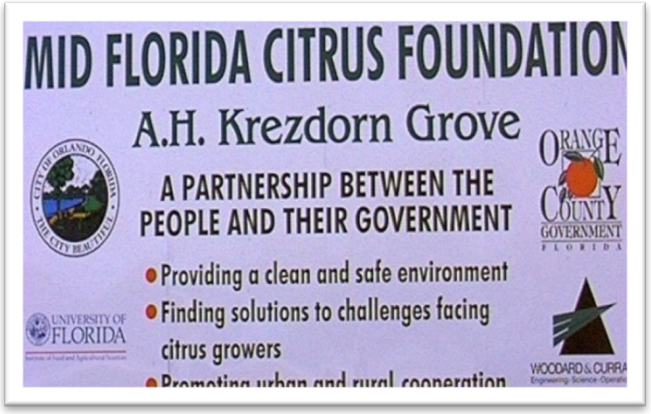
Mid-Florida Citrus Foundation

RESEARCH GOALS

- Producing Citrus Using Recommended BMPs
- Studying the Long-Term Effects of Irrigating Citrus With Reclaimed Water
- Evaluating New Citrus Varieties for Production &Marketability
- Studying the Effects of Golf Course Irrigation With Reclaimed Water
- Promoting Urban & Rural Cooperation



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Mid-Florida Citrus Foundation

RESEARCH RESULTS

- Citrus on Sandy, Well-Drained Soils Can Tolerate up to 100 Inches of Irrigation Per Year in Addition to Rainfall
- Increase in Growth Rate & Crop Yield
- Yield & Fruit Quality Vary Significantly Between Different Rootstocks
- Golf Course Grasses Respond Well to Applications of Reclaimed Water

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Contract Operation of

WATER CONSERV II

- Owners Retain Day-to-Day Management Responsibility
- Staff of 17 Professionals
- Cost-Plus-Fixed-Fee Budget – Negotiated Annually
- Computerized Maintenance Management System (CMMS)
- Bids – MWBE Participation
- Constantly Seeking the Most Efficient Way To Do Business
- Accomplish Tasks in a Timely & Cost Effective Manner

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"CITY OF ORLANDO, FLORIDA" "THE CITY BEAUTIFUL"

WOODARD &CURRAN COMMITMENT & INTEGRITY DRIVE RESULTS

ORANGE COUNTY UTILITIES DEPARTMENT

How Does this Relate

TO THE NORTHEAST?

- 3 of 6 NE states have reuse standards (MA, RI, & VT)
- Florida standards have become baseline
  - MA – State Guidelines considered FL standards
  - CT – Foxwoods & UConn designs based upon FL guidelines
  - RI – Reuse Guidelines considered FL
  - NJ – State Guidelines used FL, CA & WA
  - VT – State Guidelines considered FL

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QUESTIONS & ANSWERS

www.waterconservii.com

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