

# **Aquifer Storage and Recovery (ASR) Wells and Implementation of Lake Okeechobee Watershed Restoration Plan**

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Water Resources Accountability and Collaboration Public Forum  
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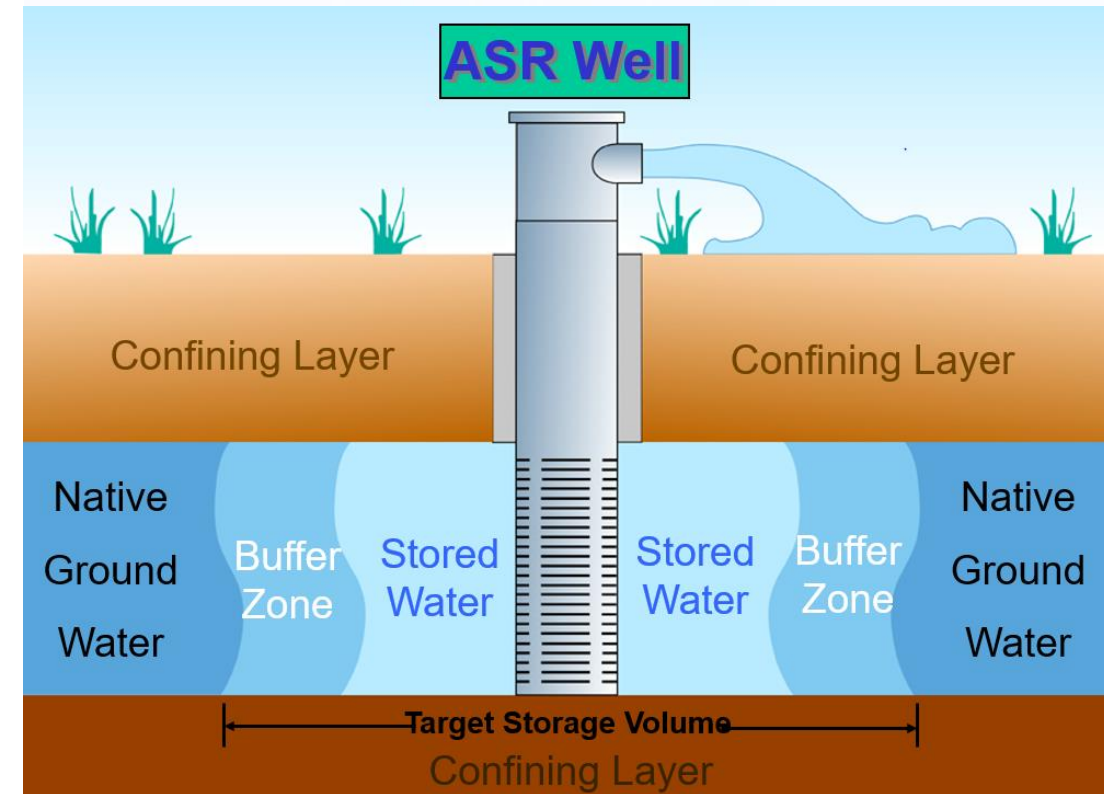
## WRAC Public Forum Topics

Topics for Today's Discussion and Feedback:

- Aquifer Storage and Recovery (ASR) Well Background
- Locations
- National Academy of Science Recommendations
- Implementation of Lake Okeechobee Watershed Restoration Plan

## ASR Well

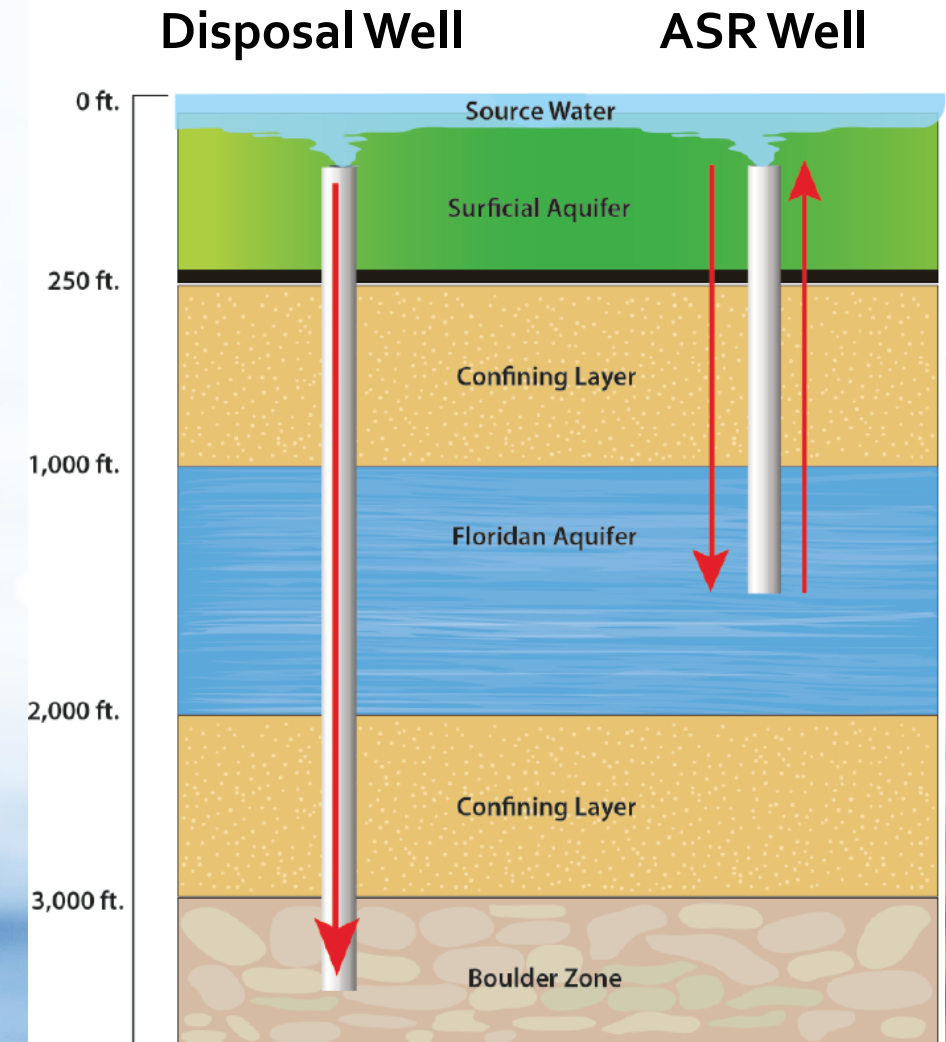
- Stores and recovers (multi-year) volumes of water underground
- One well can deliver 15-acre feet of treated water per day
- Appears to remove phosphorus but could temporarily liberate arsenic at startup depending on geology
- Can work in conjunction with reservoirs and stormwater treatment areas (STAs)
- Limited land required



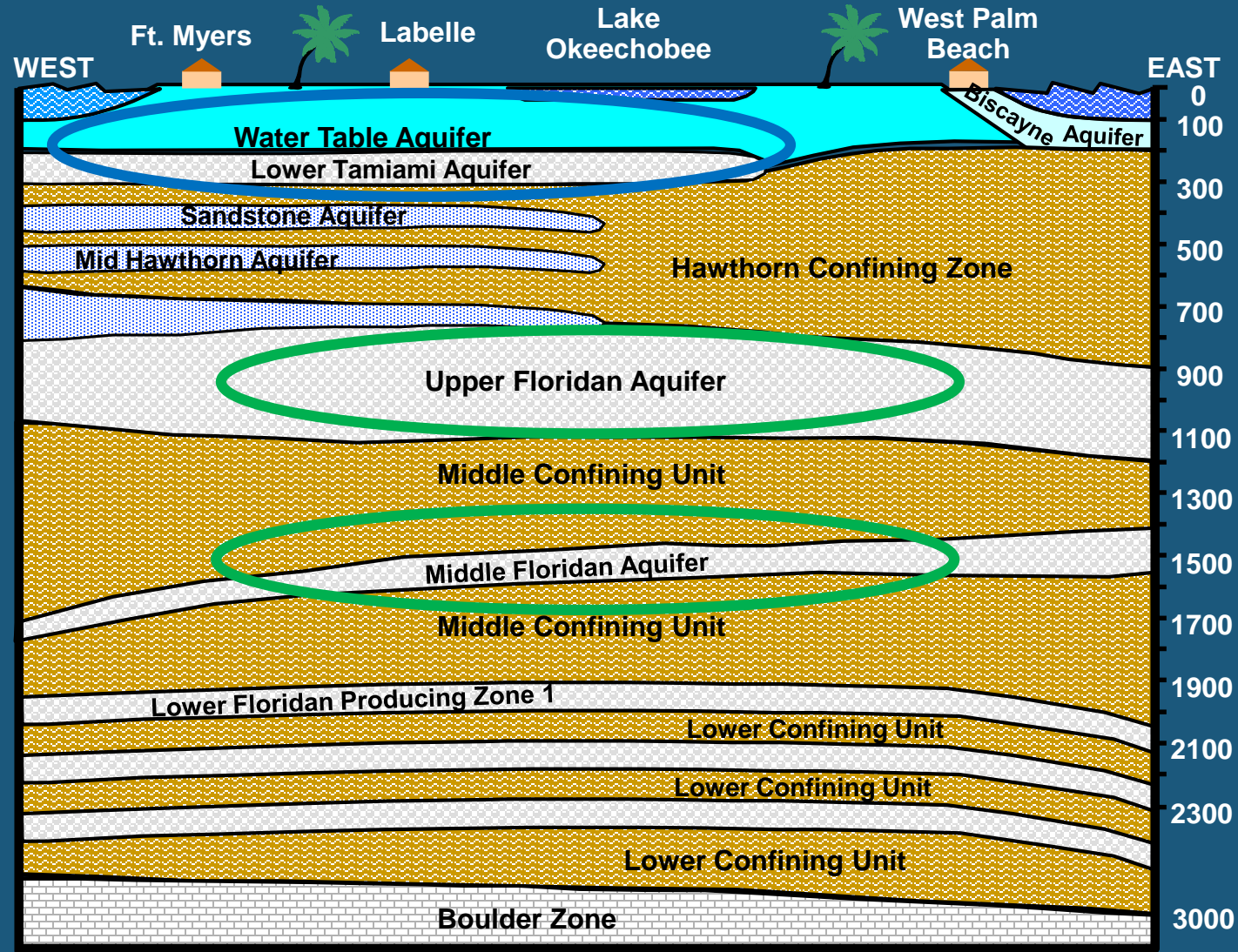


# ASR Wells are not disposal wells

- ASR wells are typically about 1,000 feet deep, whereas disposal wells are about 3,000 feet deep
- Depending on the geology of the aquifer, properly sited ASR wells can store water underground with high rates of recovery
- Water cannot be recovered from disposal wells



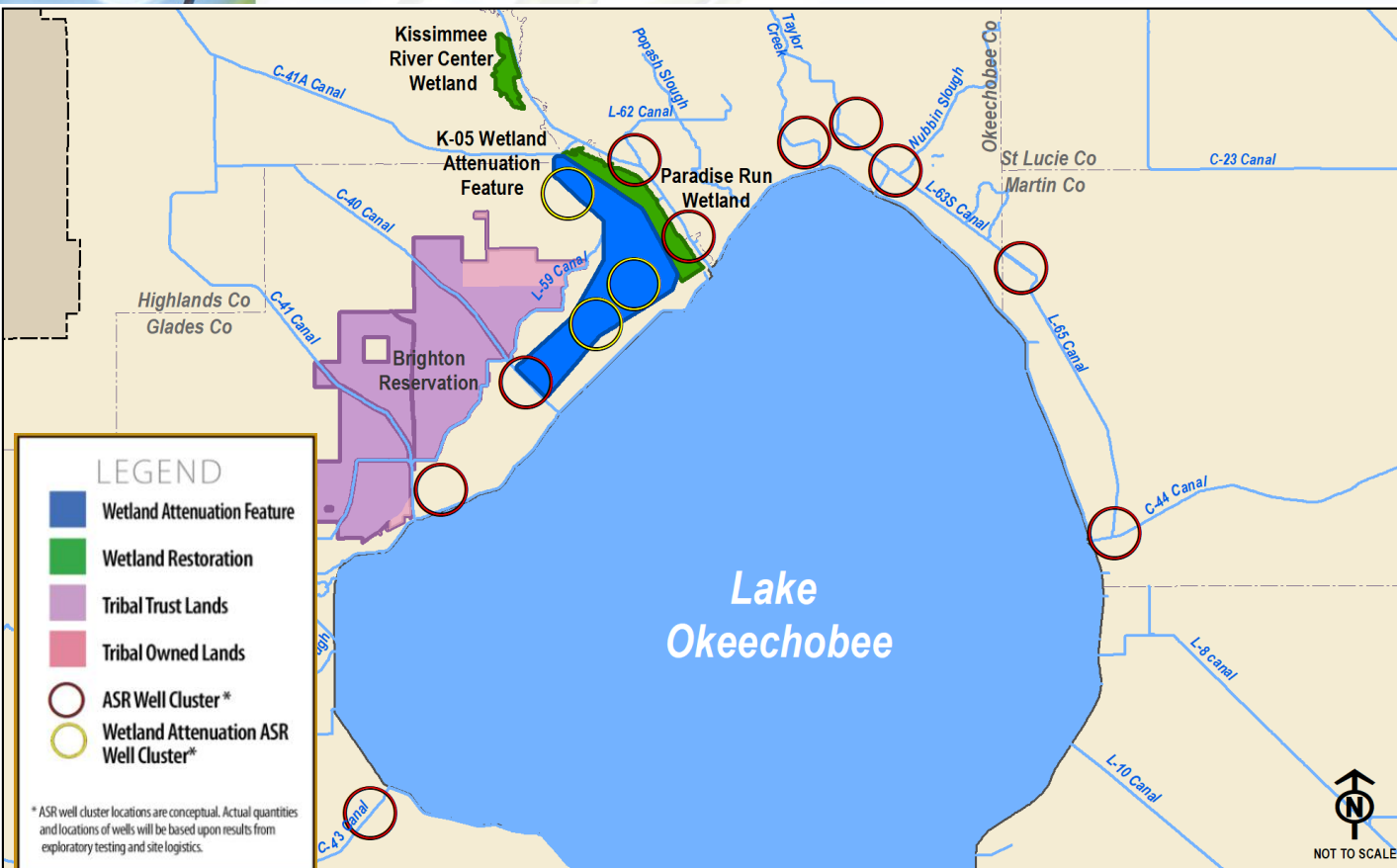
# Hydrogeology of South Florida



ASR wells in South Florida target the Upper and Middle Zones within the Floridan Aquifer

# Lake Okeechobee Watershed Restoration Project Recommended Plan

## Alternative 1BWR: \$1.96B



### Recommended Plan components:

- Shallow above-ground storage
  - K-05 Wetland Attenuation Feature (WAF)
  - ~ 13,600 acres
  - 46,000 ac-ft storage
- Aquifer storage and recovery (ASR) wells
  - 80 ASR wells
  - 448,000 ac-ft of storage per year (400 MGD)
- Wetland restoration
  - Paradise Run ~ 3,600 acres
  - Kissimmee River – Center ~ 1,200 acres

## Use of ASR Wells in Lake Okeechobee Watershed Restoration Plan

### ➤ During recharge

- Capture water that would otherwise enter Lake Okeechobee and has ability to pull water from Lake Okeechobee
- Provide the ability to store water underground to help manage high lake levels which hurts lake ecology or can lead to harmful estuary discharges
- Pre-treatment to drinking water standards

### ➤ During recovery

- ASR water delivered to the lake can help keep levels within the ecologically preferred band
- Aeration and monitoring for water quality to meet surface water quality standards
- Can provide fresh water to estuaries during extended dry periods
- Improves water supply reliability to existing legal users of Lake Okeechobee



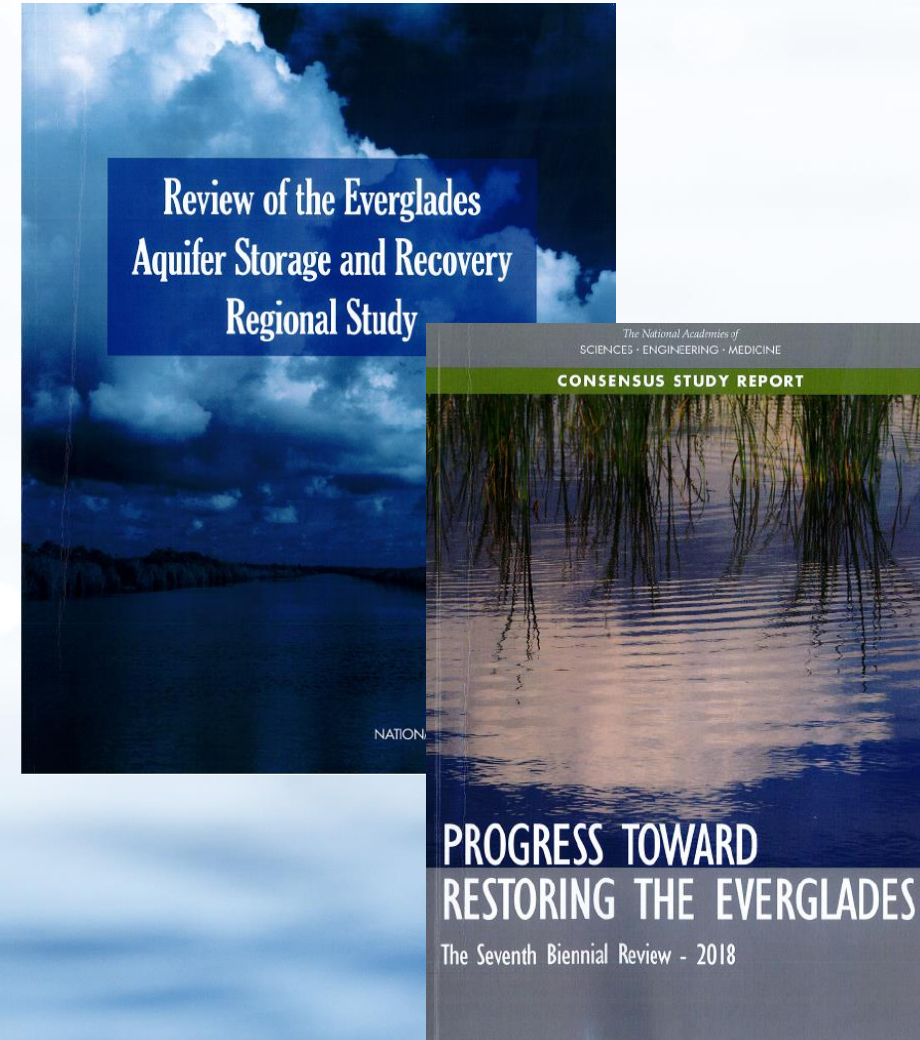
# SFWMD Incorporating the National Academy of Sciences Guiding Principles in Implementation

## ➤ National Research Council

- Phased multi-well “cluster” testing
- Larger, longer recharge and storage periods
- Expanded ecological testing with recovered water

## ➤ Design considerations

- Water treatment technology to meet permit requirements
- Passive/low-energy recovery
- Interaction between the Upper Floridan Aquifer and the Avon Park Permeable Zone
- Coordinating with U.S. Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission to address potential impacts to aquatic life





## Independent External Peer Review

- Create an independent, external Peer Review Panel to assist in addressing National Research Council (NAS) comments
- To provide assurance to stakeholders and the public that the ASR program is being implemented with sound science
- Independent panel of recognized experts in Florida hydrogeology, water chemistry, well technology, and ecology
- Will review of past projects, proposed activities, and provide recommendations on means to address uncertainties
- Meet periodically for significant project milestones and activities

# Existing ASR Facilities and Exploratory Wells

## ➤ Kissimmee ASR CERP Pilot

- Constructed/tested 2009-2013; idle since then
- Successful demonstration of CERP objectives: high capacity and high recovery

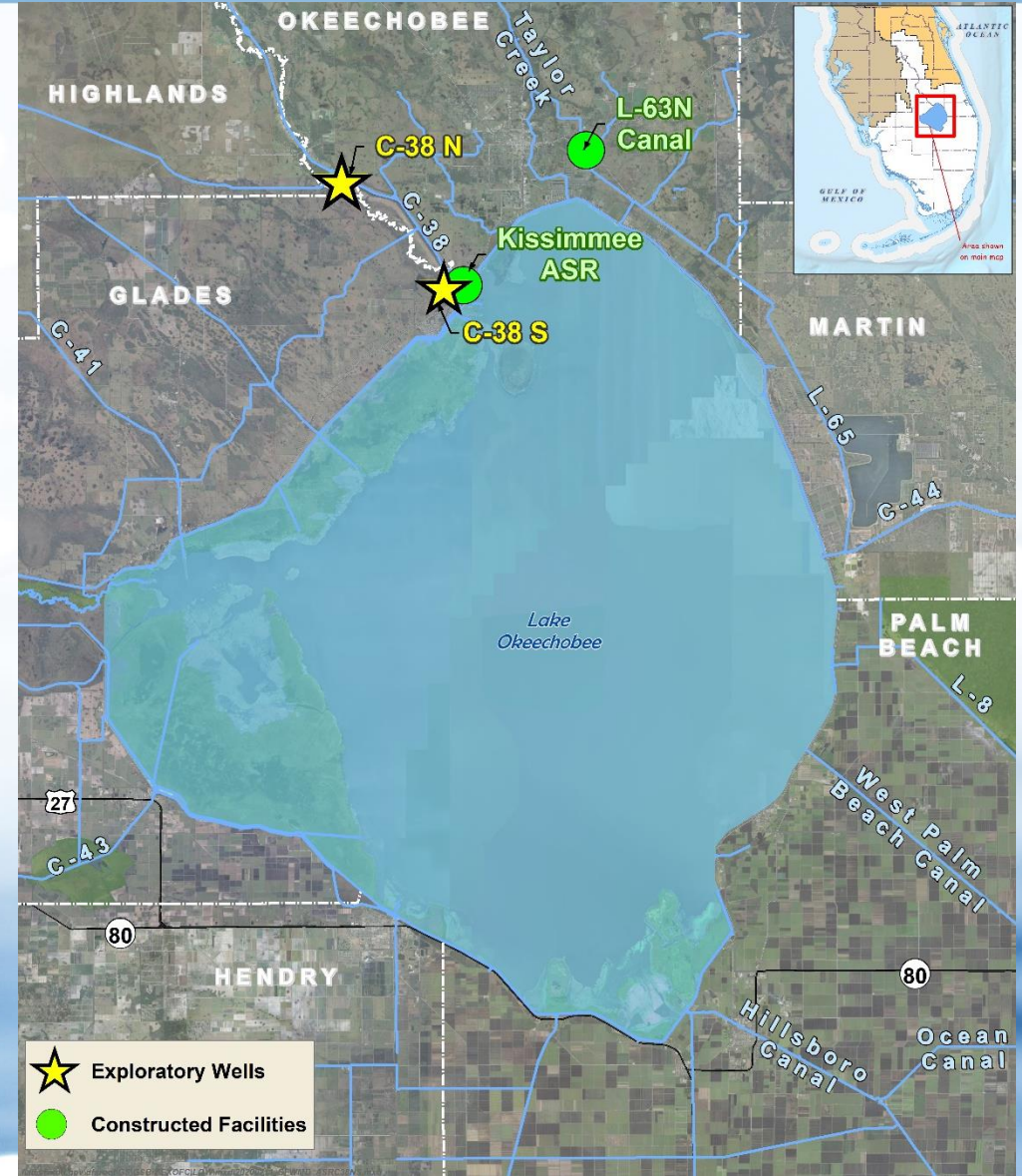
## ➤ L-63N

- Constructed/tested by SFWMD in 1980s; idle since then
- High capacity well completed in Avon Park Permeable Zone

Ongoing peer review



Ongoing peer review





# ASR Implementation Plan

## ➤ Year 1 (2020):

- L-63N ASR permitting and refurbishment
- Kissimmee ASR permitting and refurbishment
- C-38N and C-38S well pairs
  - Design and permitting

## ➤ Year 2 - 3 (2021-2022):

- L-63N ASR activation, cycle testing and operation
- Kissimmee ASR activation, cycle testing and operation
- C-38N and C-38S well pairs
  - Construction of wells
  - Design, permitting and construction of pretreatment and intake systems
  - Start cycle testing and operations

↑  
Ongoing  
Peer  
Review  
↓





# Discussion