

#### Water Sustainability 2022 Update

Joint UCNSB and City of New Smyrna Beach Commission Workshop

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#### Agenda

- UCNSB System Overview
- Raw Water and Wellfield Production Resources
- Potable Water System
- Alternative Water Supply
- Summary



# System 10-year Average Growth (FY12-FY21)

#### • Water

- Water Accounts (28,706 total in FY21)
  - 19% increase (10-year Average)
- Average Plant Capacity 49% of design capacity
- Wastewater/Reclaimed Water
  - Sewer Accounts (23,577 total in FY21)
    - 22% increase (10-year Average)
  - Reclaimed Water Accounts (3,485 total in FY21)
    - 228% increase (10-year Average)
  - Average Plant Capacity 51% of design capacity
- Electric
  - Electric Accounts (30,164 total in FY21)
    - 18% increase (10-year Average)



#### Floridian Aquifer – Raw Water Source

- One of the most productive aquifers in the world, the Floridan aquifer system underlies a total area of about 100,000 square miles in southern Alabama, southeastern Georgia, southern South Carolina, and all of Florida
- The Floridan Aquifer is the primary source of fresh groundwater for Florida's 1,000+ artesian springs and is used by more than 11 million Floridians
- The fresh water source we use to produce our potable water comes from the Upper Floridan Aquifer





## Regulatory

- Florida's five regional water management districts were established in 1972 by the state Legislature through passage of the Water Resources Act (Chapter 373, *Florida Statutes*)
- The UCNSB's raw water usage is governed by the St. Johns River Water Management District. The SJWMD is an environmental regulatory agency of the state of Florida whose work is focused on ensuring a long-term supply of drinking water, and to protect and restore the health of water bodies in the district's 18 counties in northeast and east-central Florida
- The district covers 12,283 square miles, about 7.8 million acres. The main water body in the district is the northerly flowing St. Johns River, the longest river entirely in Florida
- While the district works closely with utilities on water supply issues, the district is not a water supplier.





#### **Raw Water Source Sustainability**

- UCNSB Consumptive Use Permit (CUP) renewed by St. John's Water Management District (SJRWMD) for 20 years (2020-2040) at 8.33 MGD
  - No change in usage allowance (8.33 MGD)
  - Wellfield Pumping allowances have been rebalanced to address potential future saltwater intrusion and provide access to higher quality raw water
  - UCNSB historical data shows that our wells have held flat for chlorides (saltwater intrusion has not been a factor historically)
- UCNSB Average Daily Water Flow
  - FY21 5.099 MGD (- 0.5% from FY20)





## CUP Permit Well Pumping Allowances (2020 – 2040)

UCNSB Wellfield	Prior Permit (Max MGD)	Current (Max MGD)
Glencoe	3.25	1.55
Central	1.2	1.45
Samsula	1.94	2.86
Western	1.94	2.47
Total	8.33	8.33





#### **Aquifer Water Saltwater Intrusion**

- Source water quality, both groundwater and surface water, is at risk from saltwater intrusion due to rising sea levels, drought and changing water demands
- Saltwater is present everywhere in the aquifer deep below the freshwater. Saltwater intrusion also occurs when wells are drilled too deep or when too much freshwater is pumped from the aquifer, allowing saltwater to replace freshwater
- UCNSB historical data also shows that our wells have held flat for chlorides and saltwater intrusion has not been a factor
- The UCNSB has implemented the following to address saltwater intrusion concerns:
  - CUP Permit Rebalanced Wellfield Allowances
  - Real time monitoring of UCNSB Wells
  - Well Rehabilitation Project
  - Planned Maintenance programs
  - Operational program of well rotation that allows wells to rest between pumping cycles





## **Aquifer Recharge**

- Groundwater recharge is the process of rainwater percolating downward from the land surface into the aquifer. This happens most directly where the aquifer is unconfined
- The Floridian aquifer is a connected system that flows water from high recharge areas to low recharge areas and to discharge areas (natural springs)
- The water stored in the aquifer is replenished, or recharged, by rainfall. On average, Florida receives on average 51 inches of rain each year. However, not all the rain reaches the aquifer About 38 inches evaporates or runs off the land into surface waters, like lakes, rivers and streams, before it has a chance to soak into the ground. This leaves, on average, 13 inches annually to recharge the aquifer in limited areas





### **Aquifer Recharge and the UCNSB System**

- Groundwater recharge is the process of rainwater percolating downward from the land surface into the aquifer. This happens most directly where the aquifer is unconfined
- UCNSB Territory is located in a low recharge area
- Being located in a low recharge area of the Upper Floridian Aquifer, is not a good or bad thing. Our impact on the aquifer is monitored by the SJWMD who models and governs the entire region
- The UCNSB has implemented the following:
  - Reclaimed water (usage contributes to aquifer recharge)
  - SJWMD Well Monitoring and Reporting
  - Efficient operation of existing well sites
  - Approved Alternative Water Supply Plans





## **Raw Water Supply Projections**

- It is anticipated that the trend of lower customer usage will continue well into the future. With that said, and assuming proper wellfield maintenance continues, our current raw water allocation should remain viable through **2040**.
- Decreasing Raw Water Usage Factors:
  - Increased customer usage of Reclaimed water for irrigation, especially in all new developments
  - Regulatory agencies implementing water conservation plans and customers are using water more carefully. The federal Energy Policy Act of 1992 dramatically strengthened the plumbing code, requiring low flow toilets, showerheads, faucets, dishwashers, and clothes washers to reduce water usage.
  - Average UCNSB water use per meter/customer approx. 25% less than in 2000
  - Water utilities are paying more attention by fixing leaks within their system, installing smart meters, and reducing unaccounted for water.



#### Wellfield Evaluation and Rehabilitation

- The UCNSB has prioritized maximizing use of its existing Upper Floridan aquifer (UFA) allocation versus immediate installation and use of alternative water supplies (i.e. Lower Floridan Aquifer) through wellfield optimization, enhancements, and rehabilitation of existing supply infrastructure. The strategy to maximize the use of the existing CUP allowance includes the following:
  - Development and implementation of a comprehensive wellfield evaluation/investigation program
  - Maximize the yield of existing wells in Samsula and Western Wellfields as a priority to meet anticipated growth in the western service area
  - Fast track investigations and rehabilitation efforts for the Western Wellfield
  - Manage timing of the Central Wellfield expansion (3 additional wells) currently included in the existing CUP



#### **Potable Water System**

- Glencoe Water Treatment Plant (GWTP)
  - 10.368 MGD lime softening (Circa: 1978/2005)
- Twenty-three (23) Raw Water Supply Wells
  - Four wellfields
  - Depth: 180-feet to 364-feet
  - Withdraws from fresh ground water from the Upper Floridian Aquifer
- Four (4) offsite pump stations
- ~ 306 miles of watermains (1" to 28")





#### **Glencoe Water Treatment Plant (GWTP)**





#### Glencoe Water Treatment Plant (WTP) Upgrades

- The UCNSB has started/planned a number of projects to upgrade the facilities at the GWTP:
  - Conversion from Chlorine gas to Sodium Hypochlorite liquid (bleach)
    - Increases safety for employees and surrounding neighbors by eliminating hazardous chlorine gas
    - Eliminating the need for an EPA regulated Risk Management Plan for hazardous chemicals
  - Pellet Softening
    - Pilot project FY21 confirmed process is able to meet UCNSB treatment goals
    - Saves approx. \$8.0 Mil NPV over 20 years compared to a lime softening upgrade project
    - Eliminates lime sludge byproduct and associated hauling cost and disposal
    - Pellet Softening byproducts can be safely used for construction fill, concrete production, animal feed and landscaping material
    - Added firm production capacity will defer need for the Reverse Osmosis (R/O) Plant and brackish well investment by > 15 years



#### **Alternative Water Supply Plans**

- The UCNSB alternative water supply plan was approved by SJRWMD in 2015:
  - UCNSB approved plans for an alternative water supply from the lower Floridian Aquifer at the UCNSB Western Complex. The plan includes:
    - Four (4) alternative (brackish) water supply wells
    - An expandable 2.0 MGD Reverse Osmosis (R/O) membrane treatment plant
    - A booster pumping station
    - The R/O membrane process produces a concentrate byproduct that can be blended at the Water Reclamation Facility to supplement the reclaimed water demand
  - The installation of a Pellet Softening Process at the Glencoe Water Treatment Plan will defer the need to install an R/O > 15 years





## Summary

- The UCNSB has detailed plans to address water supply well into the future
- The UCNSB CUP renewal (2020-2040) shows that the UCNSB has done a good job managing our water supply over the years
- UCNSB continually monitors Floridian Aquifer condition assessments from SJWMD
- UCNSB has an approved Alternative Water Supply Plan (2015)
- Short-Term plans include the installation of a new Pellet Softening Process that will defer the need to implement the UCNSB Alternate Water Supply Plan (R/O plant and brackish wells) > 15 years



#### **Questions?**

