



## Memorandum

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*Subject: JEA IWRP: Preliminary Screening of 2035 Alternative Water Supplies*

## Overview

JEA is developing an Integrated Water Resources Plan (IWRP) and Demand-Side Management (DSM) Strategy that will serve as a road map for implementing water supply projects and water conservation programs through year 2070. As a component of the IWRP process, future Alternative Water Supply (AWS) options which can help JEA meet their long-term water supply needs are being conceptualized. An additional goal of JEA is to have a path for achieving 40 million gallons per day (MGD) of AWS options by 2035.

There exist several alternative sources, at a variety of locations. One of the main objectives of the IWRP is to determine what combination of options, at which locations, best meets the financial, environmental and customers' needs of the community. Even though the final IWRP report is not scheduled for completion until September 2020, the team has already conceptualized many water supply options. This memo briefly lays out one possible combination of options which meets the theme of 40 MGD of alternative supply by 2035.

During a meeting with JEA staff on July 31<sup>st</sup>, 2019 as well as follow up discussions, the full list of potential future water supply projects was screened down to four projects capable of achieving the 2035 target for alternative water supply. The four options include:

- 10 MGD of potable reuse at a new south grid site with constructed wetlands at the First Coast Natural Resource Center for storage. This alternative water would be utilized within the south grid.
- 5 MGD of potable reuse at the Arlington East WRF with the alternative water utilized within the south grid.
- 10 MGD of potable reuse at the Southwest WRF with the alternative water utilized within the south grid. A river crossing would be required for this option.

- 15 MGD of potable reuse at either Cedar Bay WRF or a new facility. This alternative water would be utilized in either the north grid or Nassau grid.

This memo provides a brief description of each of the screened alternative water supply options and a summary of the overall cost estimate to meet the 2035 alternative water supply goal. The yield for each option is a placeholder for now and final recommended capacities will be determined by the IWRP.

## Alternative Supply Options

### Potable Reuse – South Grid

Instead of delivering reclaimed water to customers for non-potable uses, reclaimed water could undergo additional advanced treatment to make it suitable for aquifer recharge (indirect potable reuse) or as an immediate potable supply (direct potable reuse). As part of the Water Purification Technology program focused on evaluating purified water for potable reuse, JEA is implementing a 1 MGD demonstration facility that can be expanded to 10 MGD of purified water production. JEA continues to evaluate both direct and aquifer recharge options and is well positioned to implement either. For this analysis, the purified water is assumed to be used to recharge the Floridan aquifer and result in beneficial reuse credits for the JEA consumptive use permit (CUP). Advanced treatment facilities are assumed to be constructed at the Arlington East WRF, Southwest WRF, and a new south grid site.

As the demand for reclaimed water is not always a direct match to the available supply, storage is a key component needed to fully utilize reclaimed water – be it through traditional means or through potable reuse. The First Coast Natural Resource Center will utilize 200 acres of land for 100-160 million gallons of reclaimed water storage within a constructed wetland. Flow from the south grid reclaimed water system could be pumped into the wetland during times of excess capacity and then withdrawn from the wetlands for use in the south grid to support implementation of potable reuse and/or meet demands for JEA's reclaimed water system. The project would also include a natural resource center and public amenities for hiking, birding, and other recreational and educational activities.

### Potable Reuse – North Grid/Nassau

This option is similar to the south grid options but would produce purified water for the north grid or Nassau grid service areas. The facility could be at the Cedar Bay WRF or a new future location depending on growth and development patterns. The purified water produced is assumed to be utilized for direct potable reuse.

## Costs

For each water supply option, preliminary capital costs were developed. These costs are intended for use as a screening level evaluation for conceptual projects. The developed costs rely on a mix of previous feasibility studies and JEA planning reports. When previous studies were not available,

cost estimates were determined in a manner consistent with planning level order-of-magnitude cost estimates. **Table 1** provides a summary of the supply option capital costs subdivided into facilities, conveyance, storage and total. The capital cost per additional gallon capacity is also provided. All costs are expressed in 2019 dollars.

**Table 1. Summary of Supply Options Costs**

Type	Supply Options	Yield (MGD)	Capital Cost (\$M)					Capital Cost per Gallon (\$/gal)
			Facility	Conveyance	Storage	Concentrate Management	Total	
Potable Reuse for South Grid <sup>1</sup>	South Grid Site with First Coast Natural Resource Center <sup>2</sup>	10	\$100	\$50	\$25	\$60	\$235	\$23.50
	Arlington East WRF	5	\$50	\$25	\$10	\$40	\$125	\$25.00
	Southwest WRF	10	\$100	\$100	\$20	\$10	\$230	\$23.00
North Grid / Nassau Purified Water <sup>3</sup>		15	\$150	\$15	\$30	\$30	\$225	\$15.00
<b>Total</b>		<b>40</b>	<b>\$400</b>	<b>\$190</b>	<b>\$85</b>	<b>\$140</b>	<b>\$815</b>	<b>\$20.38</b>

<sup>1</sup>Option is either aquifer recharge or direct potable reuse with costs shown based on aquifer recharge

<sup>2</sup>First Coast Natural Resource Center costs include educational, outreach and visitor center components

<sup>3</sup>Conveyance cost is minimal as it assumed the majority of these costs will be covered under general system expansions.