

# **Project Name: Lake Wailes Recovery Project**

**Project Location:** Polk County

**Project Number:** (New Number)

**Project Type:** Stormwater

## **Description of Project:**

The Lake Wailes Recovery Project is a stormwater transmission project to transfer flows from the Peace Creek Canal (PCC), when available, to Lake Wailes for Minimum Flows and Levels (MFL) recovery. Lake Wailes is listed by the Southwest Florida Water Management District as not meeting its established minimum water levels. This is an alternative water supply (AWS) project that will develop an augmentation water source for MFL recovery from a nontraditional stormwater supply.

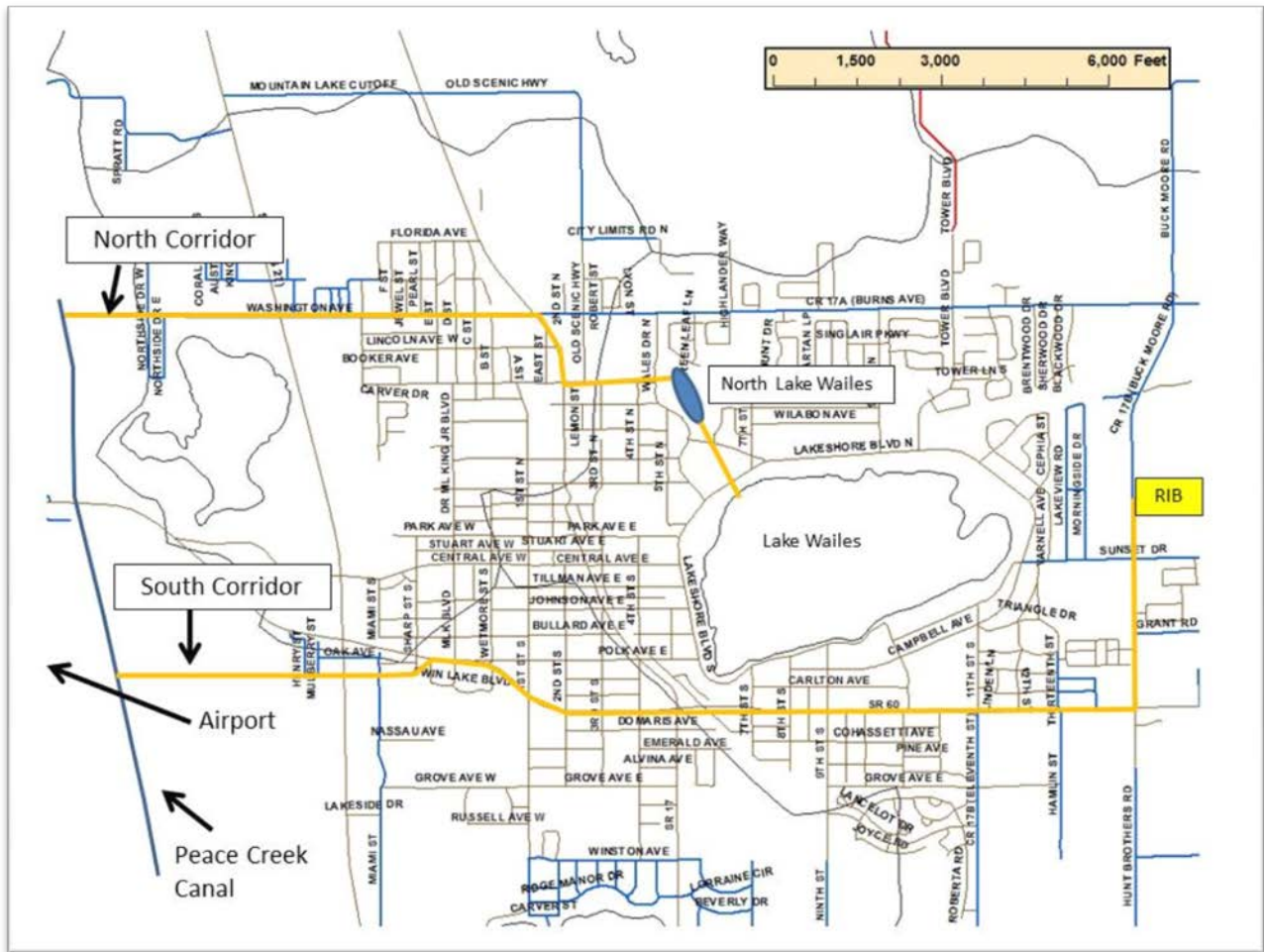
The projected finished water capacity is 1.4 mgd based on the estimated annual average flows available. The project components will have a 6.0 mgd maximum flow design capacity, based on the high-flow availability of supply from the PCC and the viable capacity of pipeline and pumping station. The beneficial recovery of the lake level is estimated at 0.2 to 2 feet.

Two routing and discharge options are identified.

1. *North Corridor:* Intake structure would be located in PCC near the western terminus of Washington Ave. at Northside Dr. West. The corridor would cross land owned by Citrus World, Inc. and would require an easement. The proposed corridor would extend east along Washington Ave., crossing US 27. A railroad track just west of US 17 would have to be crossed. At US 17 the corridor would turn south along US 17, and then east at Dr. JA Wilshire Ave. The eastern terminus of the corridor would be at 5<sup>th</sup> St just west of North Lake Wales. A discharge structure would be constructed to convey water into North Lake Wales. It is anticipated that the corridor would remain within existing City of Lake Wales utility easements to the extent practicable. A 30" diameter pipe would continue from a discharge structure at the south end of North Lake Wales to discharge via gravity flow to Lake Wailes. The pipe would be parallel to an existing 30" diameter pipe that already conveys overflow from North Lake Wales to Lake Wailes.
2. *South Corridor:* Intake structure would be located in PCC south of S.R. 60. The corridor would initiate at PCC west of US 27 east of the Lake Wales Municipal Airport. The corridor would cross land under private ownership and would require an easement. Potentially, existing depressional areas on the property could be used as storage for withdrawn water. The proposed corridor would extend east along SR 60, crossing US 27. A railroad track just east of US 17 at SR 60 would have to be crossed. The corridor would turn north at Buckmoore Rd and continue north to the proposed RIB locations east of Lake Wailes. It is anticipated that the corridor would remain within existing utility easements to the extent practicable.

Route options are illustrated in the attached conceptual diagram. Both options will require intake structures, a pump station at the creek, 20-24" inch pipeline, and outlet structures to the RIB or Lake. The northern corridor will require an additional culvert to Lake Wailes.

Water quality requirements need more investigation. Using North Lake Wales to provide a level of treatment should improve water quality but additional treatment may still be needed at the intake.



**Figure X.** Lake Wales Recovery Project Area and Routing Options

### Planning-Level Project Details:

Components of the project include the following systems:

#### Surface Water Intake

The surface water intake would be located on the PCC, and would withdraw water when flows in the creek were available. The estimated capital cost of intake for both options is \$9.1M.

#### High Service Pumping System

The pump station for both options would have an average daily flow capacity of 1.4 mgd and a maximum daily flow capacity of 6.0 mgd. The estimated capital cost for pump station is \$1.7M.

## Transmission Piping

The length, diameter, and land use criteria utilized for the cost analysis of transmission piping is shown below:

**Table X.** Estimated transmission piping length and costs for Lake Wailes Recovery Project options.

		North Corridor Option		South Corridor Option	
<i>Diameter</i>	<i>Land Use</i>	<i>Length (ft)</i>	<i>Cost</i>	<i>Length (ft)</i>	<i>Cost</i>
20"	Suburban	10,200	\$1,632,000	12,600	\$2,016,000
20"	Rural	700	\$84,000	5,000	\$600,000
20"	Directional Drill	400	\$112,000	3,400	\$952,000
30"	Suburban	1,425	\$342,000	0	\$0
<b>Total</b>		<b>12,725</b>	<b>\$2,170,000</b>	<b>21,000</b>	<b>\$3,568,000</b>

## Rapid Infiltration Basin (RIB)

The RIB is a component of the south corridor option. A preliminary review of drilling logs in the vicinity found conducive sands to below the lake water level, providing conditions favorable for RIB development. The land value was estimated from 2013 tax records of vacant land in project area. The estimated capital cost was \$4.9M.

## Project Yield:

Rainfall events and subsequent stormwater flows vary both within a year (seasonally), and from year to year (annually). Therefore stormwater flows are difficult to predict over time. Flows available for this project were evaluated for a period of record from the 1970s through 2010 using a SWFWMD model used to test scenarios for the Peace River MFL. During that period, the project team evaluated the estimated available flows for Lake Wailes recovery after the Peace River MFL was met and with no impacts to existing permitted downstream users. The estimated annual average flow available at the proposed points of withdrawal is 1.4 mgd, though on some days high flows are limited to the 6 mgd capacity of the pipeline and intake flows for the lake recovery. It should be noted that in some years annual withdrawals from PCC will exceed the 1.4 mgd target, and in some years the target will not be met, depending on rainfall amounts.

## Estimated planning-level costs:

Planning level costs for the Lake Wailes Recovery Project were made using the cost estimation (CE) tool developed for the CFWI Solutions team process **Table X** summarizes the preliminary estimated planning-level costs.

**Table X.** Summary of Estimated Planning-Level Costs for the Lake Wailes Recovery Stormwater Supply Project.

<b>Planning Level Estimate</b>	<b>North Corridor Option</b>	<b>South Corridor Option</b>
Construction costs	\$11,153,729	\$16,431,685
Non-construction costs	\$2,230,746	
Land costs	\$78,750	
Total Capital Costs	\$13,463,225	\$20,038,021
Total Annual Costs (O&M)	\$32,554/yr	\$190,168/yr
Unit Cost of Production (\$/kgal)	\$1.30	\$2.21

**Estimated Implementation Schedule:**

The project could begin a feasibility study and preliminary design in 2015 if interested parties begin discussions immediately to determine roles. Design and permitting could take 3.5 years and construction 1-2 years. Timing of this project could coincide with the Ridge Lakes Stakeholder group coming from an outreach effort of the Southern Water Use Caution Area Recovery Strategy update.

**Water Resource Constraints:**

Lake Wailes is within the boundaries of the SWFWMD, however it is also within the Lake Okeechobee BMAP drainage area. North Lake Wailes, Crystal Lake, and Lake Alta all drain into Lake Wailes. This configuration subjects the City of Lake Wales to the requirements of SWFWMD, Polk County, SWUCA, CFWI and Lake Okeechobee BMAPs (directed by DEP) and makes water management of the resource challenging. Recovery in the Ridge Lakes has been a very difficult task due to limited water resources. Lake Wailes is listed as needing additional recovery strategy.

**Project Feasibility:**

Costs could be compared to estimated recovery in Lake Wailes levels. Easement\land acquisition will be required for:

1. North corridor: Easement or purchase of land at the intake and the beginning of the pipeline from Citrus World. Easement required for new culvert from N. Lake Wales to Lake Wailes.
2. South corridor: Easement at intake or purchase of land and beginning of pipeline until reaching S.R. 60. Land will be purchased for RIB construction.

**Permittability:**

According to District staff, all Environmental Resource Permit and WUP permitting may be handled through the SWFWMD if the project does not involve a Wastewater Treatment Facility or the use of reclaimed water.

Since PCC is identified as ‘impaired’ waters, the project would incorporate water quality pre-treatment methods to the extent practicable to provide reasonable assurance that no component of the project will adversely affect the quality of receiving waters. However, the

south corridor appears to be the most feasible option from a regulatory standpoint considering potential water quality conditions of PCC. Pollutants cannot be introduced into the lake, particularly if it's not currently meeting state water quality standards. Because Lake Wailes is already impaired, the north corridor option would not be permittable if it added to the annual average nutrient loading.. Even with pre-treatment, it would be virtually impossible to eliminate 100% of the constituent in question. If there is the potential for even a small percentage of the constituent to enter the lake, the proposed discharge may not be permitted.

The project must meet the public interest test criteria listed in SWFWMD's ERP Basis of Review reference document. Also, the project must demonstrate the use of controls to prevent flooding on local residential properties. Additionally, the proposal must not cause adverse impacts downstream. The intake in the PCC should be set with a level or flow threshold to support the pump and prevent the potential for drying up the PCC in the process. Wetlands may potentially be located near the PCC at the west origin of the south corridor option. Monitoring stations will be required to track the water flows and levels along the canal and within any wetlands. Additionally, an Environmental Management Plan, including use of the Wetland Assessment Procedure, may be required to monitor potentially affected wetlands.

There is a high likelihood that the project will require a WUP (Ch. 373, F.S. and Ch. 40D-2, F.A.C.) due to withdrawal of water from one water body and adding it to another using an intake pipe greater than 4" diameter. A WUP will definitely be required for augmentation of Lake Wailes if the north corridor option is proposed. Further evaluation is necessary to determine if a WUP would be required for the south corridor option in which water from the PCC would be introduced into the natural groundwater system at the RIB site.

The RIB option (South Corridor) appears to meet the net improvement rules established by the SWFWMD. The RIB itself will serve to treat the water collected – it is a form of Best Management Practices for treating water quality and should be less complicated to permit than the north corridor option.

The RIB site will require a professional assessment for the presence of protected species and their habitat. Threatened and endangered species (e.g., gopher tortoise and sand skink) are expected to add approximately one year of permitting time to the project. Note that Polk County is in the process of developing a Habitat Conservation Plan, which should facilitate the permit process for protected species at this project site.

### **Cost-Benefit Analysis of Yield:**

The goal for this project is to increase the water level in Lake Wailes to approach or meet its established minimum level regime. The test scenarios indicated that the North Corridor direct flow option could raise the lake water level by approximately 2 feet. The South Corridor RIB option would raise the lake level by 0.2 feet, although the RIB could potentially be augmented with reclaimed water to improve reliability for additional benefit of 0.2 feet. If reclaimed water is utilized the RIB may be relocated.

**Other Considerations:**

Options to restore MFLs on the Lake Wailes Ridge are limited. Each of the project options are located in urban areas and will result in impacts to the public during construction. Public concerns over flooding may be raised with augmentation of North Lake Wales.

**Potential Partners and Governance Options:**

SWFWMD, City of Lake Wales, Polk County, FDOT. Discussions need to take place to establish organizational roles for the project.

**Funding Sources:**

SWFWMD Cooperative Funding, state funding, local sponsors.

**References:**

District Studies Internal

Polk County Studies Internal

**Regulatory Sheet Placeholder**