

WELLINGTON BASIN B PLAN

Wellington, Florida

AMERICAN SOCIETY OF CIVIL ENGINEERS Project of the Year Submittal

PROJECT:

Wellington Basin B Plan

ENGINEER:

Mock•Roos

5720 Corporate Way
West Palm Beach, FL 33407
561-683-3113

Contact Person:

Thomas A. Biggs, PE

PROJECT PARTNERSHIP:

Village of Wellington

14000 Greenbriar Boulevard
Wellington, FL 33414
561-791-4000

Contact Person:

John W. Bonde, Deputy
City Manager

South Florida Water Mangement District

3301 Gun Club Road
West Palm Beach, FL 33406
561-242-5520 (ext. 4021)

Contact Person:

Jorge A. Jaramillo, PE



Preface

The Wellington Basin B Plan (Plan) is the product of over a decade of dedicated and sound civil engineering (by Mock•Roos) implemented under the partnership and cooperation of two governmental entities -Village of Wellington (Wellington) and South Florida Water Management District (SFWMD). The Plan represents a major step forward in the conservation and protection of the natural resources and water quality in the Florida Everglades. SFWMD, through a Memorandum of Understanding with Wellington, funded \$33 million of the \$45+ million plan.

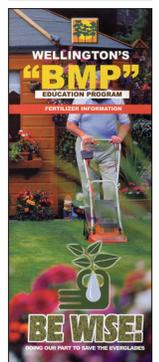
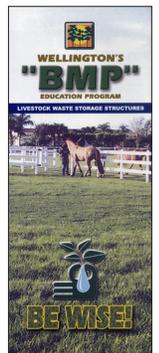
Overview

Wellington is a 18,200 acre residential community and world class equestrian destination, located in Palm Beach County, Florida. The area known as Basin B is the land area that makes up the southern "half" of Wellington. This primarily equestrian area historically drained south directly into the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge), which is part of the Florida Everglades. The 1994 Everglades Forever Act (EFA) included a mandate that waters discharging

into the Refuge after December 31, 2006, must comply with the State of Florida surface water quality standards. As part of the Comprehensive Everglades Restoration Plan (CERP), the Wellington Basin B Plan was conceived to comply with EFA requirements while maintaining historical levels of flood protection.

The Plan included the following components:

- Re-routing of stormwater runoff from the Basin B area to the north
- Creation of a surface water impoundment area
- Public education regarding the use of fertilizer containing phosphorus
- Public education regarding the management of equestrian waste products
- Implementation of Best Management Practices (BMPs) for stormwater runoff throughout the Basin B area
- Establishment of a water quality monitoring program



Basin B
Wellington, FL

\\fileserv\mktadvertisements\ASCE- Outstanding Project 24-ASCE- Proj Of The Year\in\nd

WELLINGTON BASIN B PLAN

Wellington, Florida



While the public education, monitoring and BMP implementation throughout Wellington proceeded quickly, the re-routing of stormwater runoff from a 9,230-acre area (completed December 2006), and the creation of a surface water impoundment area (completed by February 2010), required extensive study, evaluation, planning, design, and construction. The engineering effort associated with the massive stormwater “re-plumbing,” the creation of a surface water impoundment area, and overall water quality improvements is the subject of this submittal.

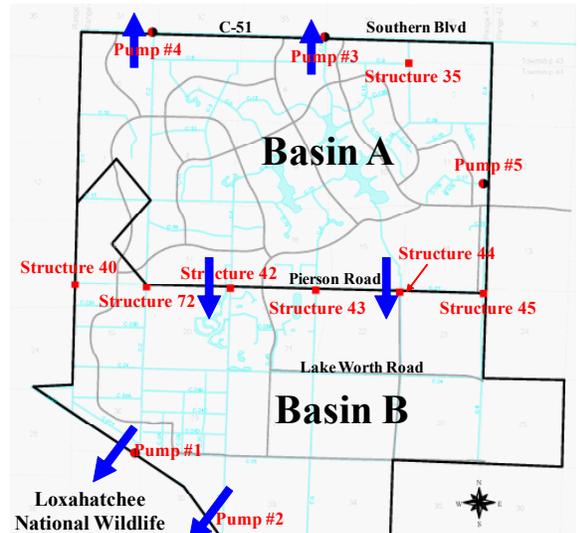
Innovative Application of New or Existing Technology

The synergistic result of numerous engineered improvements is a high-functioning water management system that serves the dual purposes of providing flood protection and enhancing stormwater runoff quality. The innovation in its design comes largely from the multi-faceted combination of the components.

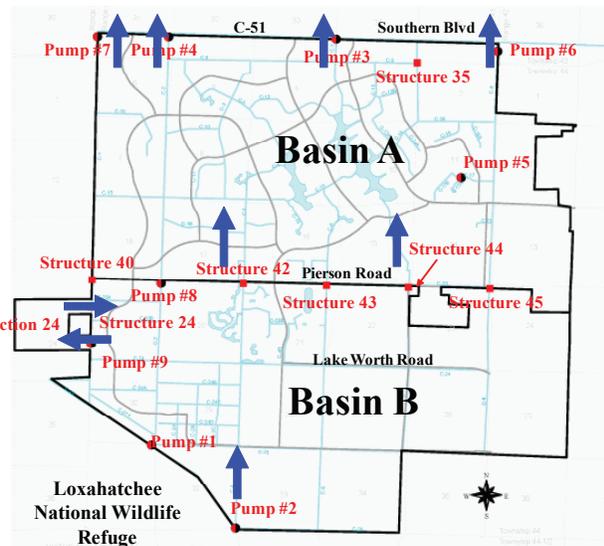


Wellington’s exceptionally large equestrian community and industry, and the resulting livestock waste, led to concerns regarding the phosphorus loading that resulted from stormwater runoff from Basin B. The decision was made to re-route Basin B stormwater runoff from its historic discharge directly into the Refuge to its current discharge path which directs it north through Wellington’s Basin A. From Basin A it is discharged into the SF-

WMD C-51 West Canal at the northern limits of Wellington along Southern Boulevard (SR 80). The C-51 West Canal is routed into the SFWMD Stormwater Treatment Area 1 East (STA-1E), and ultimately into the Refuge. This re-routing of the runoff allows a significant amount of additional water quality treatment before the water reaches the Refuge.



Water Management System - BEFORE



Water Management System - AFTER

W:\server\mktadvertisements\ASCE- Outstanding Project 24 - ASCE - Proj Of The Year.indd

WELLINGTON BASIN B PLAN

Wellington, Florida



Wellington Pump Station No. 7

The re-routing of Basin B runoff required a number of **structural improvements** within the existing system. These included:

- Renovation and/or construction of six stormwater pump stations, ranging in capacity from 20,000 to 150,000 gpm
- Miles and miles of canal widening
- Installation or modification of nine canal control structures, ranging from simple flashboard risers to large automated operable gated structures



Wellington Pump Station No. 3

In order to maintain **flood protection** within Wellington, canal improvements and the creation of a surface water impoundment was necessary. The impoundment, known as Section 24 (Wellington Environmental Preserve at the Marjory Stoneman Douglas Habitat), was the final component of the Plan and provides Basin B with an additional 255 million gallons of off-line storage.

Section 24 consisted of:

- 365-acres water storage impoundment
- Structural perimeter berm (levee)
- 90,000 gpm stormwater pump station and operable control structure
- Interior uplands and landscaping
- Planned hardscape with educational and viewing areas and tower, equestrian and pedestrian trails and boardwalks
- Increased water quality and wildlife use through wetland plantings



Section 24 Impoundment and Passive Park

To provide increased **water quality** in the re-routed stormwater discharge, the following features were included in the design:

- 365-acres wetland/marsh area
- Littoral shelves and sediment traps within the canals
- Automated trash racks/rakes at the stormwater pump stations

W:\eserver\mk\advertisements\ASCE- Outstanding Project 24 - ASCE - Proj Of The Year.indd

WELLINGTON BASIN B PLAN

Wellington, Florida



Future Value to Engineering Profession

The completion of this Plan represents a significant milestone for the engineering profession in that it is the first CERP project to be completed in Palm Beach County.



The completed Basin B Plan's success in improving stormwater quality will serve as a guide for future water quality improvement initiatives. The Plan is already an excellent example of how governmental entities can work together to execute a well developed plan. The shared goals that inspired the project (improved surface water quality and flood protection) are not uncommon and this project will provide value to those who take the time to understand all that was done to make this project a success.

It is also important that this high profile and significant project was designed and managed by a team of local professionals, whose expertise and familiarity with local conditions and systems allowed them to present an engineered solution that was constructible and met the clients' needs.

The Mock•Roos Team consisted of:

- **Mock•Roos** – survey, civil, mechanical, permitting, program management

- **BCI Engineers & Scientists** - geotechnical evaluations and berm/levee
- **Bridge Design Associates** – structural engineering
- **C&W Engineering** – electrical engineering
- **Dunkelberger Engineering & Testing** – geotechnical field exploration
- **Miller Legg** – environmental/science
- **Higgins Engineering** – permitting

Social and Economic Considerations

Wellington's equestrian residents and industry play a crucial role within Wellington and surrounding regional communities. Implementation of the Plan's BMPs and structural improvements were planned to minimize impacts on this industry, and required great care and communication with the industry representatives to insure that the solutions were *practical* and *achievable*.

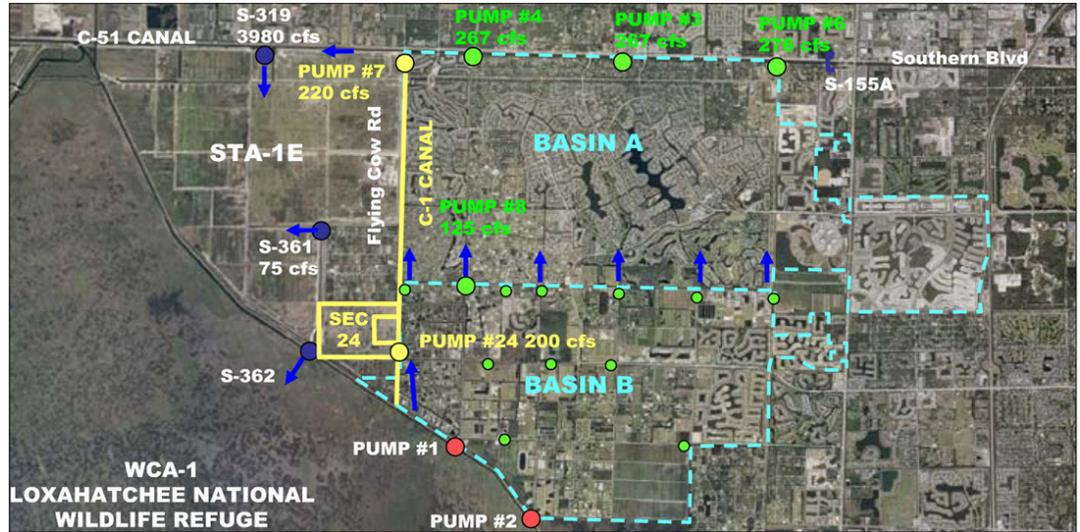
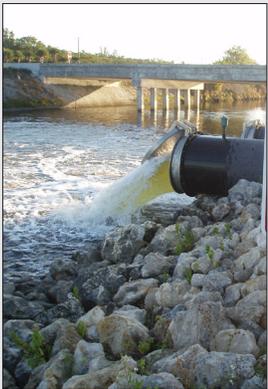


The economic importance of the Plan also lies in the cost savings that the project has and will continue to provide. If un-treated stormwater runoff were allowed to continue entering the Everglades, the clean-up costs would have been significantly higher than had the practice not been successfully corrected. The Plan has made a major stride in improving the quality of the stormwater runoff that reaches the Refuge. Cleaner surface waters also provide a social benefit that is difficult to quantify, but no less real. This project embraced every opportunity to maximize every economic/social benefit possible.

\\fileserv\mktadvertisements\ASCE- Outstanding Project of The Year\Nominee\Sector24-ASCE- ProjOfTheYear.indd

WELLINGTON BASIN B PLAN

Wellington, Florida



Further, the inclusion of a passive park within the Section 24 impoundment not only represents an opportunity for recreation, but also for education. The Park's pathways, boardwalks, observation tower and various viewing areas allow visitors to see and experience native Florida flora and fauna, literally at their fingertips. Time has taught the lesson that education is priceless in advancing an objective; in this case, environmental protection and enhancement.



Complexity of the Project

The complexity of the Plan is not as evident in the final facility, as it is in the achievement of having met the varied goals and objectives that were guiding the project. To have brought together the various solutions within one cohesive project required engineering and environmental vision and implementing the Plan required cooperation, commitment, and creativity. Only through the cooperation of Wellington and SFWMD, in conjunc-

tion with permitting agencies, was such an innovative concept implementable. Now complete, the solution will provide years of successful operation.

Exceeding Client Needs

Through the close working relationship amongst the Mock•Roos Team, Wellington, and SFWMD, the completed Plan accomplished the goals of complying with the EFA requirements for water quality, while maintaining flood protection within Wellington. However, it did much more...The flood protection levels for not only Basin B, but all of Wellington - where \$5 billion worth of personal property is located - were actually **increased**, not just maintained.

The Section 24 Impoundment component was designed, permitted and constructed for \$6 million under budget, saving tax-payers.

The well conceived incorporation of an exceptional public park within the Section 24 Impoundment allowed Wellington to meet a greenspace requirement within its comprehensive plan, saving hundreds of thousands of dollars in funds that can now be directed elsewhere. Further, it has given SFWMD, Wellington, and all its residents a showpiece water quality improvement project in which they can take great pride.

\\reserver\mktadvertisements\ASCE- Outstanding Project 24 - ASCE - Proj Of The Year.indd