City of Cocoa Beach
Stormwater Master Plan

Volume 2

by

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Statement of Purpose

Surface runoff or stormwater has been recognized in the Clean Water Act as a major contributor to surface water pollution (CWA, Section 319). Stormwater, generated when rain is unable to soak into the soil, transports dirt, oils, fertilizers, pesticides, cleaners, solvents, leaves, grass clipping, automotive wearings, pet waste and a variety of other ecologically disturbing substances into our nation's valuable water bodies. In estuaries, such as the Indian River Lagoon, freshwater (including Stormwater) is also a pollutant that disturbs the natural resources of the lagoon. Urbanization, particularly our historical urban design methods, is the main cause of the degradation of these waters.

The stormwater runoff is two-fold. As a nation, we need to control the pollutants at the source to the extent practicable and we must put structural controls in place that modify our existing urban design, to remove the pollutants that flow into our waters through drainage pipes.

Because of the adverse impact stormwater runoff has on the nation's waters, the City of Cocoa Beach will be required to obtain a Stormwater NPDES (National Pollutant Discharge Elimination System) permit from the State of Florida by 2003. The regulatory agency for this permit will be the FDEP (Florida Department of Environmental Protection) and because the Indian River Lagoon is a National Estuary and an Outstanding Florida Water, SJRWMD (St. John's River Water Management District) will also have certain authority over Cocoa Beach's Stormwater NPDES permit. For that reason, it is imperative that stormwater improvements meet with the acceptance of the State.

The Stormwater Master Plan satisfies these three essential components. The pollution prevention component is addressed in the Regulatory and Maintenance Review Sections. Together they provide non-capital, long-term solutions for reducing the potency of Cocoa Beach's stormwater runoff. This is accomplished through ordinances, policies, public education and a modified maintenance program. These non-structural solutions are low-cost but consistent and firm strategies in the plan. The goal is to minimize the amount of pollution that must be treated by more costly structural methods. Then, capital improvement and maintenance costs can be greatly lowered.

The structural controls are composed of capital and non-capital improvements. In order to clearly and accurately develop structural controls, an intensive analysis and measurement of the City's existing stormwater system and program was performed. The analysis included studying the City's topography, soils, land use, infrastructure and drainage, natural resources, historical problem areas, maintenance practices, staffing and budgetary capabilities.

A matrix was developed as a tool for testing various stormwater improvement types as to their effectiveness and application to the City. This matrix is designed using pollutant reduction goals and methodology adopted by the

SJRWMD through their SWIM (Surface Water Improvement & Management) program.

As various stormwater management solutions or BMPs (Best Management Practices) were evaluated, they were put into the matrix to assure that they provided the best solution for the City. BMPs were also analyzed for applicability and acceptance to the residents of Cocoa Beach. The matrix included pollutant efficiency and cost factors. In this way, the long-term success and budgetary feasibility could be understood. Although a recommended implementation schedule has been provided, the format of the matrix allows for flexibility should conditions such as staffing or resource capability change. It is important however that the City start the improvements as aggressive as possible as the State permit requirements are restrictive and appear as though they will be stringently enforced.

The outcome of this Stormwater Master Plan implementation will be a reduction in both the freshwater and other pollutants that flow into City canals and the Banana River. By reducing the freshwater flow to the lagoon, the City is also rejuvenating its shallow wells through natural infiltration and providing an opportunity for future reuse of the stormwater. This document will also provide guidance for the City's permit conditions in the Stormwater NPDES program.

Implementing the plan recommendations in concert with utilizing the plan's tools and resources will guide Cocoa Beach in solving the stormwater component of its watershed protection. When coordinated with wastewater and ecosystem management, the portion of the Indian River Lagoon surrounding Cocoa Beach will be healthier while preserving the lagoon's natural resources.

The City of Cocoa Beach wishes to thank St. Johns River Water Management District for their generous support, a 25% cost-share, in the development of this plan. The District has contributed greatly with information, vision and strategies. It is through partnerships such as these that the Indian River Lagoon can succeed in once again functioning as a healthy estuary.

Plan Format Description

The purpose of this section is to give a brief description of how the plan is designed and guide users and readers to specific sections of interest.

Physically, the plan has been submitted to the City of Cocoa Beach in three basic formats:

- Hard Copy, actual binder publication
- Original Electronic, native files including MS Word, MS Excel, ESRI ArcView, Visual SWMM and AutoCad drawing files which can easily be edited and updated as City seems necessary. This format is structured in files and folders and cannot be retrieved as a single document. Its purpose is to allow the City to use this master plan as a dynamic, progressive document. Delivered on compact disc (CD).
- PDF Electronic, a non-editable format retaining the exact content of the submitted approved plan. The format's small file size allows it to be easily managed and web enabled. This format is best for presentation purposes and can be structured for review as a single document. Delivered on compact disc (CD).

With regard to content organization, the plan is divided into three main parts.

Volume 1 - Executive Summary

The first volume is an executive summary - an abbreviated version of the entire plan composed of the summaries of each Stormwater Master Plan section. The purpose of this abbreviated version is to allow the public to understand the plan without getting too deep into technical background or supporting data.

Volume 2 - Stormwater Master Plan

The second volume is the detailed analysis in text and table form of each component of the plan. This is the main portion of the Stormwater Master Plan and includes the following components:

- Statement of Purpose
- Plan Format Description
- Introduction (Section 1)
- Basin Characteristics (Section 2)
- Flood Assessment (Section 3)
- Water Quality Assessment (Section 4)
- Best Management Practice Evaluation (Section 5)
- Capital Improvement Program (Section 6)
- Regulatory Review & Recommendations (Section 7)
- Maintenance Review & Recommendations (Section 8)
- Utility Review & Recommendations (Section 9)

Volume 2 contains enough detail to allow the user and reader to understand concepts presented, assumptions made and conclusions developed. This represents the full Stormwater Master Plan findings and recommendations.

Volume 3 - Appendices and Supporting Data

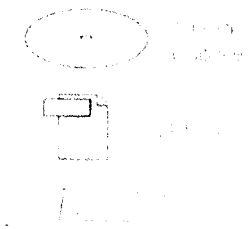
The third and last volume is the Appendices and Supporting Data on which many of the findings and recommendations are based. They are presented in text and PDF form to allow those who wish to delve into the modeling, data output and detailed map representations. The real power of this section however is in its electronic format. As the City implements the structural recommendations of the plan - the supporting data can be edited and kept current. These spreadsheets and modeling parameters will play a crucial part in satisfying regulatory requirements for pollutant load reduction in the future. The key to using this powerful tool is in preserving the data accuracy of the original spreadsheet and modeling parameters for reference. It is strongly recommended that several original non-editable versions of the software files be created by the City and archived. These files can be routinely used to predict programmatic changes, account for project implementations and even test and include new technologies of the future. These files are meant to function as a dynamic tool to help in stormwater management. This volume also includes documents relevant to the contract governing the Stormwater Master Plan.

Note: In the distributed copy of the plan, Volume 3 is available on CD only to save reproduction costs and create a more manageable document. This information is readily available for review on the CD included in each Stormwater Master Plan copy.

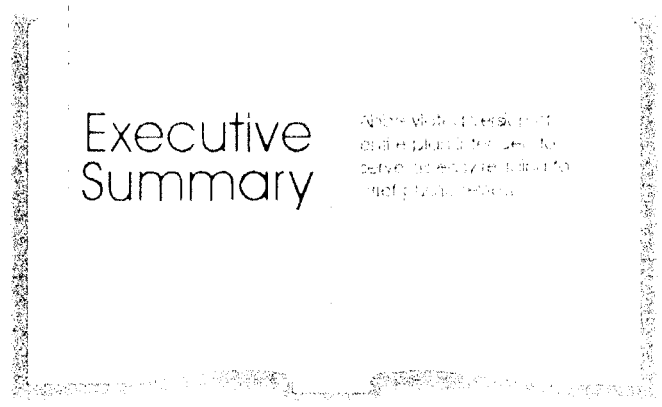
FIGUR A

Stormwater Master Plan Format

Available in

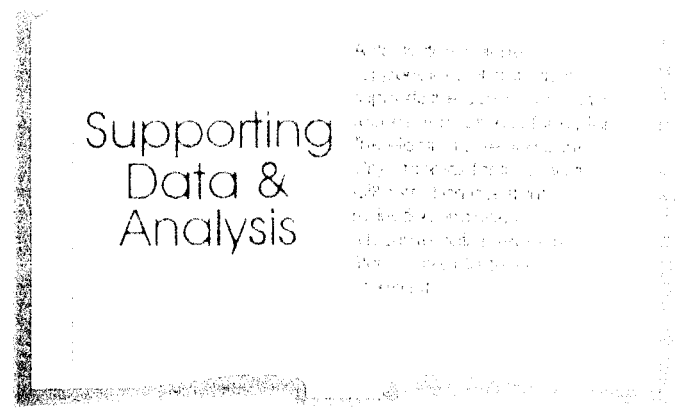


Volume 1



Volume 2

Volume 3



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