EXECUTIVE SUMMARY

Introduction

In September 2003, Hillsborough County retained Ayres Associates Inc to update the Watershed Management Plan (WMP) for the Double Branch Creek watershed, which was originally prepared in 2001. The main objective of this project is to perform water resources, natural systems assessment, Total Maximum Daily Load, and water quality modeling for the watershed and prepare its supporting documents.

This study does not include the task of updating hydrological and hydraulic models for the watershed. As a result, Chapters 1 through 6 of this report remain for the most part, similar to the original version prepared in 2001. Throughout the report, where water quantity is discussed, this was generally left unchanged. Chapters 7 through 15 have been added to the report to reflect recent watershed conditions and studies performed during this study.

Based on the information collected and the analysis performed, a series of alternatives were developed to address water quality issues within the watershed. Chapter 15 presents the recommended projects for water quality improvement. In addition, a cost estimate for each recommended project was prepared. Since no hydraulic analysis could be performed, the accurate project sizing was not known. Therefore, project costs presented in this report may be subject to adjustments, depending on their actual size and detailed designs.

Existing Condition

The Double Branch Creek watershed lies in the northwest portion of Hillsborough County. The drainage area of the watershed is conveyed to the outfalls by two major channel systems. There is an existing channel system located in the eastern half of the watershed, hereafter referred to as the Memorial Channel System. Double Branch Creek is located in the western half of the watershed. Double Branch Creek has two distinct branches called the West Branch and the East Branch. The East Branch can be further broken down into the Nine Eagles Fork and the Right Fork. The watershed has two major and one minor outfall connections to Double Branch Bay. The project area contains a mix of undeveloped and urban land use. Significant residential areas located in the watershed include Countryway, Westchase, Nine Eagles, Twin Branch Acres, and Arbor Lakes.

Water Quality, Natural Systems, and TMDL Requirements

The assessment of existing water quality and natural systems for the watershed is presented in Chapters 7 and 8, respectively, while water supply issues are discussed in Chapter 9. The existing information was used to perform pollutant loading and removal modeling (Chapter 10). The modeling results were used to develop water quality level of service (LOS) that is discussed in Chapter 11. Public involvement process and survey of potential contaminant sources are described in Chapters 12 and 13, respectively. Subsequently, best management practices (BMPs) were

developed to address existing water quality issues that are presented in Chapter 14. In selecting the location for final structural BMPs, attempts were made to identify and use available publicly owned properties. Additional exploratory site visits were also performed to examine the suitability of the sites for specific projects. Final recommendations along with individual preliminary cost estimates are presented in Chapter 15.

To meet water quality standards both the Federal (Clean Water Act [CWA]) and state (Chapter 62-302, Florida Administrative Code [F.A.C.]) rules apply, and certain actions must be taken to protect, restore, and maintain water quality. In addition, for the area of this project, discharges to surface waters are also regulated by the Florida Department of Environmental Protection (FDEP), Southwest Florida Water Management District (SWFWMD), Hillsborough County Environmental Protection Commission (HCEPC), and/or the US EPA, depending on types and magnitude of the discharge. Water quality assessment of the watershed and TMDL evaluations were conducted taken into considerations all the applicable regulations by collecting water quality data and using a water quality model described in Chapter 7. A brief summary is described below.

Overall Water Quality Level of Service (LOS)

Using an average score for all water quality parameters combined, the overall LOS score for the entire watershed is an F. The greatest concentration of D and F scores for total nitrogen, total phosphorus, and TSS, was located in the central region of the watershed primarily surrounding the Westchase neighborhood. This area is predominantly comprised of various density residential land uses. These land uses contribute large quantities of various pollutants into surface water bodies. The overall low LOS score for the entire watershed (F) indicates that many subbasins surrounding large areas of contiguous remnant natural systems have been developed to some degree, resulting in low LOS scores for seemingly large undeveloped subwatershed.

Unless effective treatment measures are implemented, continued loading to surface waters in the watershed, and eventually into Old Tampa Bay, may result in significant water quality degradation. Efforts to reduce loading of pollutants to the Double Branch Creek, channels, lakes, sinkholes, and groundwater should be incorporated into future management activities for the watershed. Reduction of pollutant loading should include implementation of local and regional stormwater best management practices (BMPs) to reduce or eliminate pollutant loading to receiving waters. To achieve this goal, a variety of BMPs, such as wet detention ponds, baffle boxes, alum treatment, improved wastewater treatment systems, and restoration of natural ecosystems may be used.

Natural System Conditions

The Double Branch Creek watershed area encompasses 16,668 acres in Hillsborough County. The watershed contains plant communities, both terrestrial and aquatic, that provide a variety of important environmental functions, including habitat for listed species and other wildlife, stability for stream banks and lake shores, improvement of water and air quality, protection of coastal shorelines from storm surges, and moderation of water and air temperatures. However, plant communities have undergone several periods of significant alteration since the 1830s as land use

in the watershed changed from original conditions to agriculture to the current suburban/urban uses. Land use shifts have left the watershed with substantially less acreage in native plant communities, impaired water quality in streams, degradation of all plant communities by non-native invasive plants, highly disturbed stream banks and lake shores, and a reduction of length of coastal shoreline protected by marshes. Most populations of native wildlife have been reduced and/or eliminated. The changes to the natural system impact ecosystem behavior in ways that may alter water quality and viability of habitats. In order to remedy the adverse impacts to water quality, maintain healthy habitats, and meet the regulatory requirements, appropriate BMPs are recommended. Such recommendations are made based on the survey of existing natural conditions and water quality improvement goals.

Regulatory Background/TMDL

The Total Maximum Daily Load (TMDL) was originally promulgated as a part of the Federal Water Pollution Control Act and was later expanded by the Clean Water Act (CWA). The law requires states to define state-specific water quality standards for various designated uses and to identify water bodies that do not meet established water quality standards. Water bodies that do not meet such water quality standards as a result of human-induced conditions, are to be considered impaired.

In Florida, the TMDL process is multi-phased and includes identification, verification, and listing of impaired waterbodies, followed by the development and implementation of constituent-specific TMDL for different water quality parameters. The Double Branch Creek watershed has recommended TMDLs for DO and coliforms by FDEP. Public water supply requirements have impacted water levels/quality in both the surface water system and aquifers in the Tampa Bay region and TMDL development for receiving waters will be required in the near future.

Pollutant Loading and Water Quality Level of Service (LOS)

The gross pollutant loading within the watershed was estimated based on the 2004 land use and soils characteristics. The 2004 land use map indicated 10 different land use categories that were evaluated for the pollutant loading model. Water quality evaluations were performed by assessing 12 water quality constituents in receiving waters. Gross pollutant loading was estimated by assuming no treatment of stormwater runoff. This parameter indicates the potential of each land use in yielding contaminants into the environment. To approximate the net pollutant loading within the watershed, the loading reduction due to the existing BMPs, was subtracted from the gross loading value for that watershed. Analyses were conducted at both watershed and subbasin levels. The details of these analyses are discussed in Chapter 10 of this report.

Based on these results, a water quality treatment level of service was determined at the subbasin and watershed levels within the Double Branch Creek watershed. This type of analysis facilitates prioritization of water quality improvement alternatives for the watershed.

Water quality treatment levels-of-service criteria were used as part of this study to allow comparisons of existing and proposed stormwater treatment conditions to pollutant loading goals and to help prioritize alternative BMPs throughout the watershed.

Three water quality constituents were identified and analyzed in greater detail due to their importance in local water quality management programs. These parameters included total suspended solids, total phosphorus, and total nitrogen. In addition, based on specific concerns, some subbasins required assessment of other parameters, including heavy metals and bacteria. Excess nitrogen can stimulate algal growth resulting in reduced light penetration through the water column, resulting in loss of seagrass. Other factors that affect light availability in the Bay are also of concern, including excess total suspended solids. Excess phosphorous can promote eutrophication and algal blooms, leading to degradation of water quality. Results from the pollutant loading model were used to develop LOS for each water quality constituents that are fully described in Chapter 11 of this report.

Structural BMP Alternatives

Analyses were performed using GIS to strategically locate structural BMP sites for water quality and natural systems improvements. Various methods were used to identify feasible alternative projects for implementation that are described extensively in Chapter 14. Water quality conditions were evaluated using the County's Water Quality Treatment Level of Service criteria and pollutant loading model. The proposed alternatives are developed to improve water quality and natural systems consistent with the overall goals of the County.

Recent aerial photos were used to identify the most suitable and cost-effective sites for implementation of structural BMPs. The main criteria for site selection included proximity to streams/rivers (500-meter buffer zone), open areas, and publicly owned properties that are readily available for stormwater treatment in the form of retention or detention facilities. Initially a total of 28 locations for potential sitting of structural BMPs are identified. Of the 28 potential sites, 16 fall within the 500-meter buffer of major streams. GIS analyses were performed to verify that the identified sites had no existing construction and were open areas suitable for construction of a stormwater treatment facility. The analysis showed that only 11 of the 28 identified sites met this criterion. Further GIS analyses were performed to identify the parcels that were publicly owned. This resulted in seven sites that met all the criteria. A field survey was conducted to examine the feasibility of placing BMPs at these seven sites. The survey confirmed that all seven sites are feasible for implementation of stormwater treatment facilities. These sites are recommended as potential structural BMPs locations based on the established criteria in this study. Site location, photos, maps and detailed preliminary cost estimates are described in Chapter 15. A brief summary of each site and total costs are presented below:

1. Lake Sunset 1

This site is located at the intersection of Lake Sunset Drive and Sheldon Road. This large, open parcel is cleared and undeveloped and could easily encompass a structural BMP. Land

designation for this area is unclear; however, the size and location of the parcel make it a good site for a large treatment pond. A small water feature is located in the middle of the site. The area is privately owned; however, the size of the site, the lack of built-up features, and its proximity to the stream network make it a good choice for a potential water quality structural alternative. This site is located in the eastern part of the Double Branch watershed – an area dominated by residential and built-up lands contributing large amounts of pollutants into the watershed's surface waters. This particular site is adjacent to two residential communities. A retention/treatment pond would provide much needed water quality improvement to the surrounding areas. The estimated cost of implementing such facility is $3,195,937.

2. Lake Sunset 2

This site is west of site 1 above with very similar features. A retention/treatment pond would provide much needed water quality improvement to the surrounding areas. The estimated cost of implementing this facility is $7,168,662.

3. Double Branch Road

This site is located at the corner of Double Branch Road and Hillsborough Avenue. Field inspection identified it as a very large undeveloped and heavily wooded parcel. An open land area is visible in the center of the parcel. There is no visible signs of a wetland feature, therefore, a wetland improvement / expansion project would not be possible. There are signs of some exotic plants (Brazilian pepper) on the premises. Although this site is privately owned and land acquisition costs may be substantial, it should be considered as a potential water quality project improvement location. The size of the site and its openness would allow for construction of a large size retention pond. The estimated cost of implementing this facility is $ 10,328,428.

4. North River Road

This parcel is located at the corner of North River Road and Four Wheel Drive. Field inspection identified it as a large parcel utilized for agricultural and pasture purposes. The land is mostly open with a small wetland feature in the center of the property. The area is fenced out and has what appears to be a stable located to the west of the property. This site is surrounded by a number of residential subdivisions that contribute various pollutants into the watershed's surface waters. Although this site is privately owned and land acquisition costs may be substantial, it should be considered as a potential water quality project improvement location. The size of the site and its openness would allow for construction of a substantially sized retention pond. The estimated cost of implementing this facility is $930,964.

5. Douglas Road

This parcel is located at the corner of Douglas Road and Race Track Road. Field inspection identified it as a small undeveloped and heavily wooded parcel (pine and live/water oak present). An open land area is visible in the center of the parcel and a small wetland feature appears on the edge of the property (bald cypress dome present). This location may have been zoned for development. The location is in close proximity to a small power transfer station. Although this site may be privately owned and land acquisition may be required, this site should be considered as a

potential water quality improvement project location. The size of the site and its openness would allow for a water retention system or a wetland improvement/expansion project. The estimated cost of implementing this facility is $621,787.

6. Countryway/Citrus Park Drive

This site is located at the intersection of Countryway Boulevard and Citrus Park Drive. This is a large upland tract that could easily encompass a structural BMP. The parcel is partially wooded with pines, palmetto, and underbrush. The size and location of the parcel make it a perfect location for a large treatment pond. In addition, a small wetland is located in the center of the site. The area is fenced out and is privately owned, however the size of the site, the lack of built-up features, and its proximity to the stream network make it a good choice for a potential water quality structural alternative. The size of the site allows for construction of a large retention/treatment pond and existence of a small wetland offers a possibility of a wetland improvement project. This site is also surrounded by many residential neighborhoods and may provide much needed water quality improvement to the surrounding areas. The estimated cost of implementing this facility is $4,280,086.

7. Race Track

This alternative is located at the intersection of Race Track Road and Patterson Road. This is a large open parcel that could easily encompass a structural BMP. The parcel is cleared and undeveloped, and designated as pasture land. The size and location of the parcel makes it a good site for a large treatment pond. No wetland features are visible on the site. The area is fenced out and is privately owned; however, the size of the site, the lack of built-up features, and its proximity to the stream network make it a good choice for a potential water quality structural alternative. The estimated cost of implementing this facility is $7,783,197.

In addition to the structural BMPs enumerated above, there are various state and local agencies that provide educational and outreach materials for the public at large and academic institutions. The specifics of these educational programs are presented in Chapter 15.