Lemon Bay

WATERSHED MANAGEMENT PLAN

Sarasota County

Southwest Florida Water Management District

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Chapter 5

Water Supply

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5.1 INTRODUCTION

Developing a sustainable water supply is a goal of Sarasota County and is addressed as an element of this Watershed Management Plan (WMP). The sustainable water supply component of the WMP focuses on stormwater-derived alternative water supplies since potable and reclaimed sources are covered under the County's Comprehensive Plan and water and wastewater master plans. These alternative supplies focus on offsetting the use of potable water for irrigation.

A general finding from Chapter 3 is that a significant amount of stormwater in the watershed could be beneficially used while maintaining flows to the Bay and creek system. The task involved identifying opportunities and developing conceptual water supply plans for excess stormwater runoff. These plans provide a foundation for developing stormwater-harvesting projects that will help the County meet their sustainable water supply goals.

Harvesting stormwater runoff provides a source for an alternative water supply while maintaining flows to Lemon Bay and the creek system.

The County and the Southwest Florida Water Management District (SWFWMD) work in conjunction to develop alternative water supply projects and options to meet the demands within the local government's jurisdiction. The process is consistent with Subsection 373,061(7) (a) FS as outlined in the 2010 *Draft SWFWMD Regional Water Supply Plan (RWSP)* Executive Summary states "within 6 months following approval of an RWSP, the District is to notify each local government covered by the RWSP. Within 1 year after the notification, each local government is required to provide to the District notification of the alternative water supply projects or options which it has developed or intends to develop; an estimate of the quantity of water to be produced by each project; and the status of project implementation, including development of the financial plan. The information provided in the notification is updated annually and a progress report is provided to the District." The report continues, "Section 163.3177(6) (c) F.S. also indicates, within 18 months after Governing Board approval of a RWSP, local governments in the Planning Region must update their comprehensive plans incorporating a work plan detailing alternative and traditional water supply projects, including conservation and reuse, necessary to meet the demand within the local government's jurisdiction, covering at least a 10-year planning period."

Jones Edmunds reviewed the County Comprehensive Plan, both master plans, and SWFWMD's RWSP to understand how the alternative water supplies analyzed in the WMP may best fit into the County and regional plans. No projects in the RWSP are specific to the Lemon Bay watershed. However, some of the pertinent excerpts from those plans are included in this chapter to help illustrate how the projects and programs discussed here fit within larger planning efforts. The following are guiding principles developed for SWFWMD's RWSP from 2001 to 2006:

- *An emphasis on conservation*: Conservation is treated as a potential source of water for all major use types (e.g., agriculture, public supply, industrial, etc.).

- *An emphasis on reclaimed water:* Reclaimed water is a major source type that has been investigated to meet future demands. This includes evaluation of new reclaimed water projects and an investigation into how existing reclaimed water projects can be made more efficient.

- *The role of constraints such as minimum flows and levels*: Potential water supply options included in this RWSP have been identified and screened using a number of criteria. Before these or any other future water supply options are implemented, projects must meet the conditions of a new water use permit from SWFWMD.

- *Avoiding the need for mitigation of new withdrawal impacts*: All the water supply development options contained in the RWSP are designed to minimize the need for future mitigation. A number of the projects are intended to help offset impacts of existing projects.

- *Realistic demand projections*: SWFWMD used the best available information in the development of estimated future water demands within the Planning Region. This information included significant input from all major use sectors and other experts in the field.

- *Existing state policy on "Local Sources First":* SWFWMD's RWSP seeks to maximize local sources consistent with existing State policies and SWFWMD rules. According to the RWSP, sources located within the Planning Region are sufficient to meet all projected reasonable and beneficial demands through the planning period. Therefore, sources outside the Planning Region were not investigated.

- *Changes in water resources legislation.* Senate Bill 444, passed during the 2005 legislative session, substantially strengthens requirements directed at identifying and listing water supply projects. Changes made by the legislation are intended to foster better communication among water planners, city planners, and local utilities. Local governments are now able to develop their own water supply assessments and the Water Management Districts are required to consider them when developing their RWSPs. Local governments are directed to incorporate alternative water supply projects that they choose from the RWSP into the capital improvement elements of their comprehensive plans. The Water Management Districts are required to develop the RWSP in coordination with local water supply authorities. An additional provision of the bill was the creation of the Water Protection and Sustainability Program, a trust fund that provides state matching funds to water management districts and local governments or private entities for the construction phase of alternative water supply projects.

- *Expanding agricultural conservation programs*. By 2025, SWFWMD intends to work with the agricultural industry to reduce water use in the Southern Water Use Caution Area (SWUCA) by 40 MGD through agricultural water conservation measures. The Florida Department of Agriculture and Consumer Services (FDACS) and SWFWMD have developed the Facilitating Agricultural Resource Management Systems (FARMS) program. FARMS is an agricultural best management practices (BMPs) cost-share reimbursement program that involves both water quantity and quality aspects. FARMS is intended to expedite implementation of production-scale agricultural BMPs that will help agriculturalists reduce groundwater use from the Upper Floridan aquifer, improve water quality, and restore and augment the area's water reach this ambitious goal. The SWFWMD is also continuing to fund agricultural research projects. Since 1979, the SWFWMD has funded nearly 150 projects that help growers conserve water.

- *Water supply planning efforts by coalitions of local governments*. Water supply planning efforts have been undertaken by alliances of local governments and water supply authorities. In addition to developing new water supply options, these entities took the planning level information in the 2001 RWSP and over the next 5 years refined it to provide more detailed information on the cost and feasibility for the water supply options in their local areas of interest. The 2006 RWSP has been structured to incorporate much of the detailed information developed from these planning efforts. SWFWMD has coordinated closely with these efforts and in some cases has provided funding.

- *Assisting the recovery of groundwater resources through conjunctive use*. Public water supply systems that are capable of conjunctive use have access to both groundwater and alternative sources such as surface water or desalinated seawater. In areas where the recovery of groundwater levels is necessary, it is important to have the ability to reduce groundwater withdrawals when possible. Maximizing the use of alternative sources when available can achieve reductions while ensuring demands are met. For example, water suppliers with access to both groundwater and surface water can maximize the use of surface water during periods of high flows, which enables reductions in groundwater use. Additionally, the development of off-stream reservoirs and aquifer storage and recovery (ASR) for storage helps sustain yields of surface water sources well beyond high rainfall periods, which allows for further reductions in groundwater use. Through the optimized use of all available sources, it may be possible to accelerate the process of achieving the desired rate of groundwater level recovery. SWFWMD will be working with water utilities and water supply authorities to explore the feasibility of implementing a conjunctive use approach to managing their water supplies.

❖ *Meeting future demand through land-use transitions.* In the SWUCA, land uses such as agriculture and mining are being displaced by residential and commercial land uses. Water needs of expanding residential and commercial land uses will likely be met in many areas by alternative supplies, such as the harvesting and storing the wet season flow of rivers, reclaimed water, and conservation. Because the land uses being replaced rely almost entirely on groundwater, there will be a net reduction in groundwater use. A portion of this groundwater will be retired to help meet the minimum aquifer level aimed at minimizing salt-water intrusion. The remainder can be used to meet the demands of residential and commercial development in areas where access to alternative supplies is limited.

❖ *Advances in the SWFWMD's scientific understanding of the resource; the Atlantic Multidecadal Oscillation.* Based on an emerging body of research, SWFWMD scientists have recently recognized that the region experiences prolonged wet and dry cycles that last an average of approximately 30 years. These cycles, known as the Atlantic Multidecadal Oscillation (AMO), are caused by multidecadal periods of warming and cooling of the North Atlantic Ocean's surface waters. Periods of warmer ocean temperature generally result in increases in rainfall over peninsular Florida. AMO has profound implications for SWFWMD's water supply planning efforts. For example, harvesting and storing the wet-season flow of rivers is the alternative source with the greatest potential to meet future water supply needs. Since river flows are largely rainfall dependent, the 30-year rainfall cycles result in significant variations in river flows. The region is currently in the wet portion of the AMO cycle and river flows during the wet seasons will be higher, on average, than flows in the dry portion of the cycle. In determining minimum flows, assessing the impacts of land uses, and planning for water supply projects for rivers, scientists and engineers must base their conclusions on flow data that encompasses both wet and dry periods. Assessing the rivers based on the current high rainfall conditions could result in minimum flows that are set too high and yield projections that will be impossible to achieve during the dry portion of the cycle.

The following are policies developed for the *Sarasota County Comprehensive Plan*:

ENV Policy 4.6.9 Water conservation shall be given priority in the design of plantings for public rights of way. Recycled water shall be utilized for irrigation purposes wherever possible.

WATER Policy 1.3 Continue to explore and use alternative and supplemental water resources to conserve and replace the use of traditional potable water supplies.

WATER Policy 1.3.1 The County shall continue implementation of the reuse policies in the Wastewater Management Plan in order to reduce the demand on potable water supplies and withdrawals from ground water aquifers.

WATER Policy 1.3.2 The County shall reclaim treated wastewater for irrigation purposes as its primary method of disposal for treated wastewater. The use of deep well injection or surface water discharge shall be used only when opportunities to use reclaimed water for irrigation is not available.

WATER Policy 2.3.2.2.IV.(e) By 2007, Sarasota County shall provide design standards for low impact design (LID) measures to mitigate the effect of impervious surfaces and stormwater pollutants on increased runoff volumes. LID design measures may include, but are not limited to, bio-retention areas, porous pavement, roof gardens, rainwater/stormwater recycling, etc.

WATER Objective 3.3 Continue to implement programs to conserve potable water resources.

WATER Policy 3.3.4 New development shall prioritize meeting irrigation needs through (1) demand management strategies, (2) reclaimed water, if available, (3) rain water or stormwater, and finally, (4) community ground water wells.

The County will need to expand its reclaimed water system to beneficially use all its reclaimed water according to its *Draft Wastewater Master Plan Report*. An excerpt from the report's *Executive Summary*, in which this need is described, is provided below:

The County has an extensive system of reclaimed water storage and transmission pipelines. The primary means of effluent management is the reuse of reclaimed water for irrigation. The County does not have the facilities or the number of customers to reuse all reclaimed water. A typical reclaimed water irrigation system without significant storage will be capable of reusing about 50 percent of the reclaimed water produced due to seasonal supply and demand. The County currently reuses about two thirds of the

> *reclaimed water produced, since there are large storage ponds available. Since all reclaimed water cannot practically be reused, other means of disposal must be provided. The County has plans for adding a deep injection well (DIW) at the Central County Water Reclamation Facility (WRF). That DIW, plus the existing DIW capacity available in the North and South County, will provide sufficient backup disposal to irrigation.*
>
> *This report presents a number of reclaimed water enhancement projects that could be implemented by the County to improve service to existing irrigation customers and to expand the amount of reclaimed water reused. To maintain the 2:1 reuse to DIW disposal ratio, it would be necessary to have a similar volume of long-term reclaimed water storage available and to have a proportional number of reclaimed water customers. The current volume of reclaimed water storage available is equivalent to about 45 days of the reclaimed water produced. Additional storage could be provided by more ponds at new locations or by ASR wells. Ponds require large land areas and siting may be a problem. ASR wells have the advantage of a small land area to provide a large amount of storage; however, there are technical issues with ASR wells that make permitting of additional wells problematic.*

The beneficial end-use of harvested stormwater is generally irrigation.

The beneficial end-use of both reclaimed water and harvested stormwater is generally irrigation. The “excess” reclaimed water leads to a complicating factor for implementing stormwater harvesting as the transmission system is more developed and reuse of reclaimed water (instead of discharging or injection) is viewed as more environmentally and regulatory friendly. When considering irrigation as the end-use of an alternative water supply and knowing a higher nutrient concentration is associated with reclaimed water than stormwater, the preferred order of use is reclaimed water before harvested stormwater from a pollutant-loading to the environment perspective.

For this WMP, all the projects are identified as stormwater-harvesting projects. Although the conceptual plans discuss stormwater harvesting, some of these projects may be better suited as reclaimed water projects if infrastructure and availability of reclaimed water is determined to be more beneficial and cost effective than using harvested stormwater.

While augmentation of reclaimed water with harvested stormwater is permittable (62-610.472(3), FAC), design and operational issues associated with this type of system will require special attention. Specifically, a one-way flow device must be installed so reclaimed water is not introduced to the stormwater system, a condition that is not permittable. From an operational standpoint, disinfection must be provided and the fecal coliform and total suspended solids limits established for high-level disinfection must be met (62-600.440(5), FAC) for the treated surface water or stormwater supply before mixing with the reclaimed water.

5.2 POTENTIAL PROJECTS

Stormwater-harvesting opportunities in the County can be divided by scale: regional, sub-regional, and local. Regional scale projects impact water supply for the entire watershed; local scale projects are implemented by homeowners for individual property conservation and use such as rain gardens and cisterns; sub-regional scale projects impact communities such as irrigation systems within a subdivision.

At the largest (i.e., regional) scale, stormwater may be available as a potable water supply or as a supplement to a potable water supply, such as the opportunity with the Venice Minerals reservoir in Dona Bay watershed. Historical dredging projects, mostly agriculturally based, diverted flow from the Myakka River to the Dona Bay estuary. A 2007 report prepared for Sarasota County discusses the amount of excess freshwater that has been added to the estuary by the Cow Pen canal diversion. A project is planned to harvest the excess freshwater from Cow Pen and divert it to a reservoir at Venice Minerals to restore a more natural hydrologic regime to the watershed and create a potable water supply alternative. At the next largest (i.e., subregional) scale, stormwater may be available largely as a non-potable irrigation source or supplement. Opportunities at the subregional scale will typically serve a limited number of larger entities, such as a residential development or a golf course. At the smallest (i.e., local) scale, stormwater-harvesting opportunities are typically confined to the individual property owner. Regardless of scale, the following four components are necessary components to implement a stormwater-harvesting project:

- ❖ Sustainable supply—There needs to be a sufficient volume of stormwater to satisfy all or a significant percentage of the intended end use. In general, the amount of supplemental supply typically needed increases as the scale decreases. The available volume must be in excess of what is needed to sustain a healthy downstream ecosystem, which is covered in Chapter 4.

- ❖ Storage—The timing between the availability of stormwater and the needed end use rarely coincide. Thus, storage is required to bridge the timing gap between supply and demand. Larger storage volumes translate to higher rates of using harvested stormwater but at larger costs.

- ❖ Transmission/distribution system—Distance and elevation differences between the supply/storage location and the end use must be overcome with a transmission/distribution system. At the regional scale the relative cost of this component is typically not as large since the distribution system to the end user usually exists. At the local scale, the distribution system is typically simple to construct and maintain. The transmission/distribution system at the subregional scale is often the limiting factor for stormwater-harvesting opportunities because of the relatively high cost of the component—particularly for retrofits.

- End use—A beneficial end use is necessary to implement a stormwater-harvesting project. At the regional scale, the end use is typically as a potable water source. At the subregional and local scale, it is typically as a supplemental irrigation source. Although end uses for stormwater are somewhat widespread throughout the Lemon Bay watershed, the challenge is to cost-effectively match them with the other three components—sustainability, storage, and transmission/distribution. Regardless of whether the end use of the stormwater is potable or non-potable, effective conservation measures should remain in place.

Although not listed as a necessary component above, treatment in some form is usually needed in stormwater-harvesting projects at the two larger scales. The type of treatment varies by end use.

The following subsections present potential projects at the three scales discussed above.

5.2.1 Regional-Scale Projects

Conditions for regional-scale stormwater-harvesting projects are not highly favorable in this watershed for two primary reasons. First, the watershed consists of six major basins that are relatively small, and one of the basins, Lemon Bay Coastal Fringe, does not have a primary stream system. Second, the most favorable storage locations in terms of having the largest contributing area are in largely built-out portions of the watershed and have highly brackish water.

The only potential stormwater-harvesting projects that could be considered regional-scale projects are in Forked Creek, Gottfried Creek, and Ainger Creek—where they would serve as supplemental or primary irrigation sources in the Lemon Bay watershed. Those projects are discussed below.

5.2.1.1 Forked Creek Regional Stormwater Harvesting (LBWS01)

Based on the connectivity in the County's ICPR model, the Forked Creek regional stormwater-harvesting site—shown in Figure 5-1—has a contributing surface area of approximately 2.3 square miles, which is marginal in size for a regional-scale watershed. The land use is predominantly undeveloped, agricultural, and low-density residential land uses.

This project offers the possibility of providing a supplemental alternative water supply (most likely for irrigation to agricultural uses east of the storage location under current conditions), the ability to restore the water budget in the basin closer to historical conditions, and the ability to reduce pollutant loads. One disadvantage is that the magnitude of the potential demand is currently unknown. As shown in Figure 5-1, the potential agricultural users to the east currently have water use permits for surface and groundwater withdrawals. Another slight disadvantage from a pollutant-loading perspective is that the contributing area served by the project is not projected to have relatively high loads, due in part to the relatively low runoff volumes. Also, none of the property in the vicinity of where the regional facility would be best suited is owned by the County.

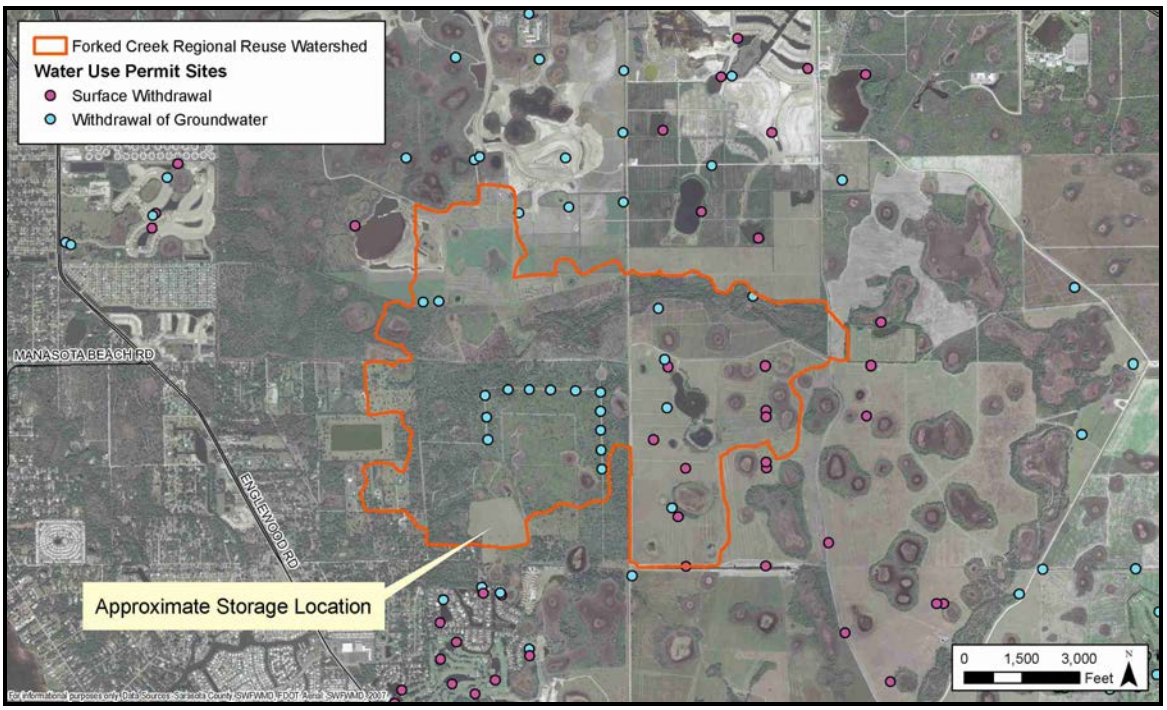

Figure 5-1 LBWS01—Forked Creek Regional Stormwater Harvesting

Other benefits from this project partly depend on the amount of water that can be beneficially used. Flood protection benefits will be relatively small (on the order of 0.1 foot near the storage facility) since this would likely need to be designed and permitted as an off-line storage facility. The estimated average annual reuse water volume that would be achieved is 190 ac-ft/year, which corresponds to a total nitrogen reduction of approximately 750 lb/year.

5.2.1.2 Gottfried Creek Regional Stormwater Harvesting (LBWS02)

Based on the connectivity in the County's ICPR model, the Gottfried Creek regional stormwater-harvesting site has a contributing surface area of approximately 7.3 square miles of predominantly undeveloped and agricultural land uses. The approximate location of the site and that of the contributing watershed is shown in Figure 5-2.

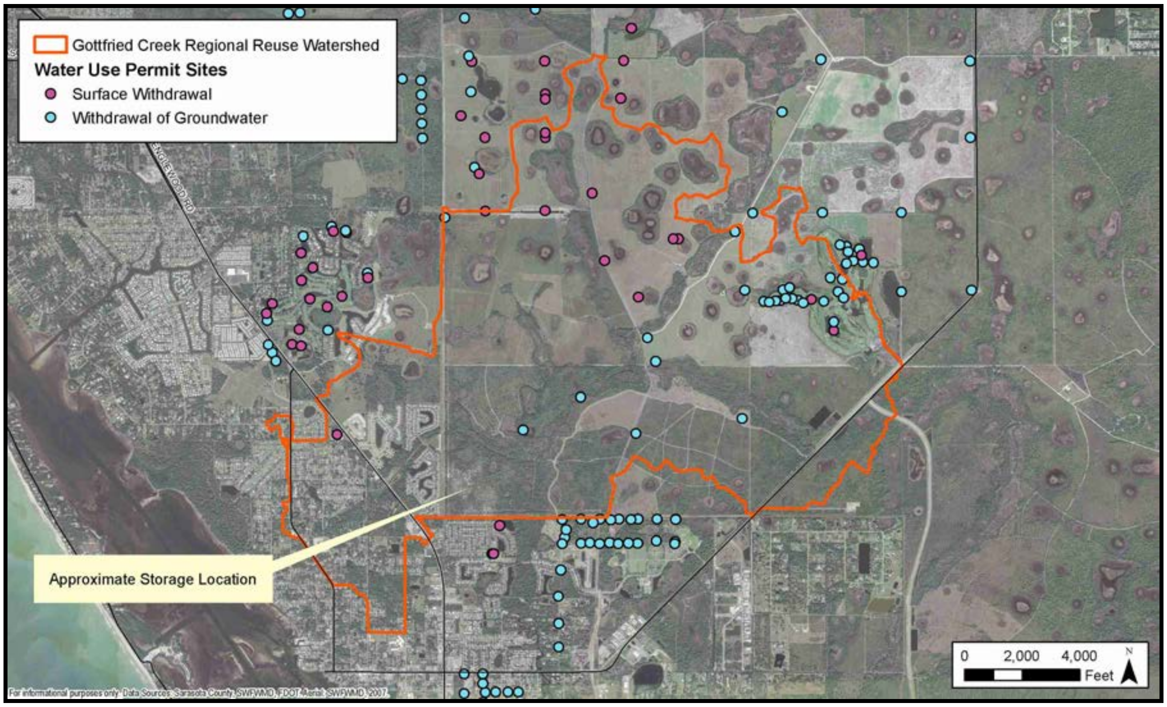

Figure 5-2 LBWS02—Gottfried Creek Regional Stormwater Harvesting

Similar to LBWS01, this project can serve as a supplemental alternative water supply, help to restore the historical water budget, and reduce pollutant loads. The most likely current uses would be for agricultural irrigation north and east of the storage location and possibly the golf course near the eastern edge of the watershed. As shown in Figure 5-2, those users currently have permitted surface and groundwater withdrawals, so the actual demand for the harvested water is unknown. Also similar to LBWS01, the contributing area served by the project is not projected to have relatively high loads and none of the property in the vicinity of where the regional facility would be best suited is owned by the County.

Flood protection benefits will be relatively small since this would likely need to be designed and permitted as an off-line storage facility. The estimated average annual harvested water volume that would be achieved is 500 ac-ft/year, which corresponds to a total nitrogen reduction of approximately 2,100 lb/year.

5.2.1.3 Ainger Creek Regional Stormwater Harvesting (LBWS03)

Based on the connectivity in the County's ICPR model, the Ainger Creek regional stormwater-harvesting site has a contributing surface area of approximately 10 square miles of predominantly undeveloped, agricultural, and low-density residential land uses. The approximate location of the site and that of the contributing watershed is shown in Figure 5-3.

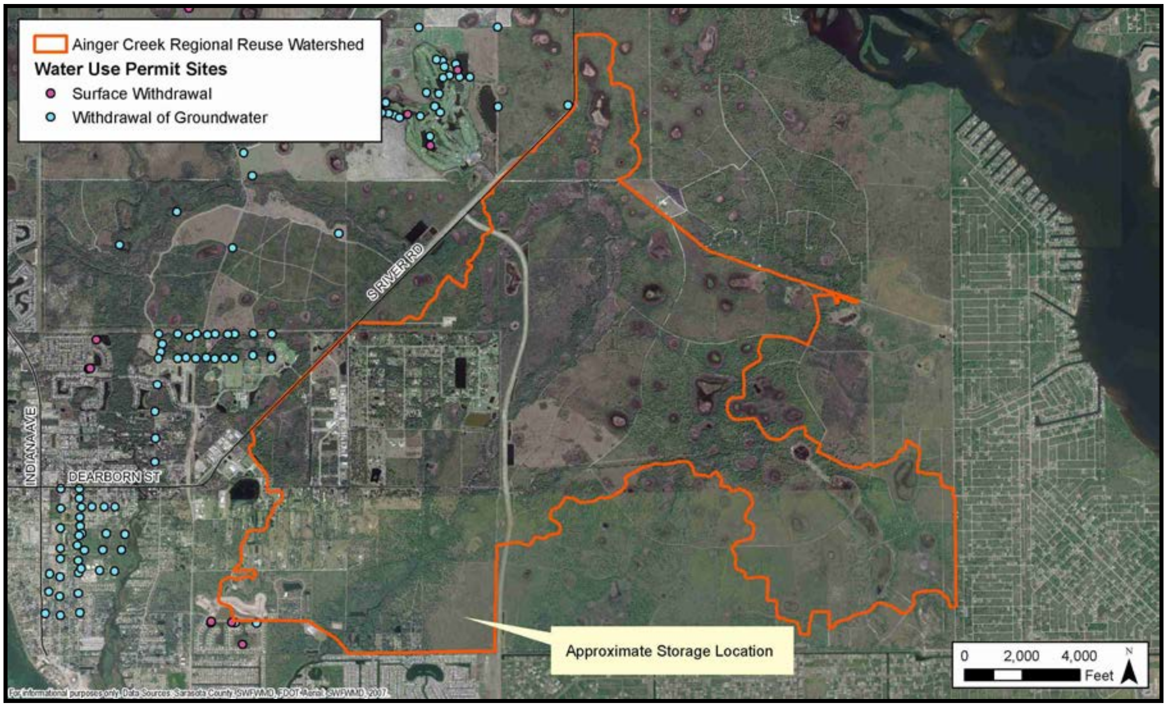

Figure 5-3 LBWS03—Ainger Creek Regional Stormwater Harvesting

This project has similar benefits and challenges to LBWS01 and LBWS02. One difference (potential disadvantage) from LBWS03 is that the majority of the current end use opportunities within the watershed and the site itself are within the Myakka River State Park. The estimated average annual harvested water volume that would be achieved is 1,200 ac-ft/year, which corresponds to a total nitrogen reduction of approximately 4,000 lb/year.

5.2.2 Subregional-Scale Projects

Subregional-scale stormwater-harvesting opportunities in the Lemon Bay watershed exist largely as projects that can provide a non-potable irrigation source or supplement. Subregional-scale projects will typically serve one or two larger users (e.g., a golf course). Sustainable supplies are relatively plentiful throughout the watershed since the water budget analysis indicates that there is a greater average annual discharge under existing conditions than under historical conditions and since there is an abundance of potential withdrawal locations. Because of the relatively small storage footprint required for a stormwater-harvesting system, an abundance of potential storage locations throughout the watershed would also rely on retrofitting existing ponds or constructing new ponds on available property. A significant portion of the subregional-scale harvesting opportunities identified in this subsection are also within areas that could be served by the regional-scale projects.

Transmission/distribution is one of the most limiting factors for stormwater-harvesting opportunities in this watershed. Irrigation systems that use stormwater cannot be connected to potable distribution systems because of concerns over potential contamination of the potable source. Retrofitting most existing urban land uses (e.g., residential development) with separate or disconnected irrigation systems is typically cost-prohibitive. Therefore, subregional opportunities were limited to areas where separate distribution systems already exist or where retrofitting the distribution system may not be cost-prohibitive. The complicating factor of excess reclaimed water was discussed previously in this chapter.

With the information above, Jones Edmunds screened the Lemon Bay watershed for potential subregional stormwater-harvesting opportunities. The areas served by reclaimed water as estimated for the SIMPLE-Monthly model input or that are close to a reclaimed transmission line were not included in the screening process. The screening focused on larger neighborhoods with neighborhood associations, schools, parks, recreational fields, libraries, cemeteries, and other locations provided by the County. Using the criteria discussed below, Jones Edmunds established a scoring system for ranking the potential locations as stormwater-harvesting projects. The criteria have cost and feasibility implications. In each case, a higher score indicates a more favorable value with respect to the harvesting opportunity at the site.

- ❖ Distribution—This criterion reflects the relative difficulty of constructing a stormwater-harvesting distribution system, with values ranging from 0 to 2. A value of 0 represents a new distribution system that would need to be constructed in an area with many site constraints. A value of 2 represents a distribution system that is largely built and that only needs a relatively small number of additions or improvements.

- ❖ Availability of onsite storage—Values in this category range from 0 to 2, with 0 representing that all storage would need to be constructed, 1 representing that usable storage is present but significant expansion would be required, and 2 representing that it may be possible to use existing storage with little to no modification.

- ❖ Harvesting demand—Values in this category range from 0 to 3, with 3 representing the highest irrigation needs in terms of volume over the site area. These values are largely based on the rates from the irrigation feature class developed for the SIMPLE-monthly model.

Points were assigned to each category. Because of their relative respective impacts to cost using the value ranges discussed above, a weighting factor of 2 was applied to distribution and availability of onsite storage. After applying the weighting factor, Jones Edmunds summed the values in the three categories for an overall score. The 53 sites evaluated are shown in Figure 5-4. Unweighted scores for each criterion and total weighted scores are shown in Table 5-1. The polygon labels in Figure 5-4 correspond to the project IDs in Table 5-1, except that the leading "LBWS" has been removed for readability. The projects in Table 5-1 are sorted by total score.

Table 5-1 Summary of Potential Subregional Stormwater-Harvesting Projects

Project ID	FLUCCS Description	Area (acres)	Distribution	Demand	Storage	Total
LBWS13	PARK	137.4	2	3	2	11
LBWS26	GOLF COURSE	143.3	2	3	2	11
LBWS27	GOLF COURSE	93.7	2	3	2	11
LBWS04	LIBRARY	2.9	2	2	2	10
LBWS06	SCHOOL	18.0	2	2	2	10
LBWS23	PARK	9.2	1	2	2	8
LBWS55	CROPLAND AND PASTURELAND	966.7	2	2	1	8
LBWS21	PARK	6.3	1	1	2	7
LBWS38	OPEN LAND	10.6	1	1	2	7
LBWS39	OPEN LAND	3.4	1	1	2	7
LBWS46	OPEN LAND	2.8	1	1	2	7
LBWS09	PARK	2.2	1	0	2	6
LBWS22	PARK	7.0	0	2	2	6
LBWS29	PUBLIC LAND	166.1	1	0	2	6
LBWS32	PUBLIC LAND	222.7	1	0	2	6
LBWS34	OPEN LAND	9.8	1	0	2	6
LBWS35	OPEN LAND	3.8	1	0	2	6
LBWS36	OPEN LAND	7.9	1	0	2	6
LBWS41	OPEN LAND	3.2	1	0	2	6
LBWS43	OPEN LAND	2.2	1	0	2	6
LBWS44	OPEN LAND	5.1	1	0	2	6
LBWS45	OPEN LAND	35.1	1	0	2	6
LBWS47	OPEN LAND	10.1	1	0	2	6
LBWS57	CROPLAND AND PASTURELAND	161.2	1	1	1	5
LBWS10	PARK	4,525.4	1	0	1	4
LBWS12	PARK	3.2	1	0	1	4
LBWS14	PARK	5.4	0	0	2	4
LBWS19	PARK	3.3	0	0	2	4
LBWS24	PARK	3.2	0	0	2	4
LBWS25	PARK	6.4	0	0	2	4
LBWS37	OPEN LAND	41.3	1	0	1	4
LBWS40	OPEN LAND	4.2	0	0	2	4
LBWS05	SCHOOL	9.5	1	1	0	3
LBWS20	PARK	3.9	1	1	0	3
LBWS15	PARK	21.4	1	0	0	2
LBWS28	PUBLIC LAND	10.3	1	0	0	2

Table 5-1 Summary of Potential Subregional Stormwater-Harvesting Projects

Project ID	FLUCCS Description	Area (acres)	Distribution	Demand	Storage	Total
LBWS30	PUBLIC LAND	97.6	1	0	0	2
LBWS31	PUBLIC LAND	72.3	1	0	0	2
LBWS07	PARK	140.5	0	0	0	0
LBWS08	PARK	10.2	0	0	0	0
LBWS11	PARK	8.3	0	0	0	0
LBWS16	PARK	5.6	0	0	0	0
LBWS17	PARK	4.9	0	0	0	0
LBWS18	PARK	3.1	0	0	0	0
LBWS33	PUBLIC LAND	77.7	0	0	0	0
LBWS42	OPEN LAND	28.6	0	0	0	0
LBWS48	CROPLAND AND PASTURELAND	9.7	0	0	0	0
LBWS49	CROPLAND AND PASTURELAND	694.4	0	0	0	0
LBWS50	CROPLAND AND PASTURELAND	23.4	0	0	0	0
LBWS51	CROPLAND AND PASTURELAND	81.0	0	0	0	0
LBWS52	CROPLAND AND PASTURELAND	46.0	0	0	0	0
LBWS53	CROPLAND AND PASTURELAND	4.8	0	0	0	0
LBWS54	CROPLAND AND PASTURELAND	177.9	0	0	0	0
LBWS56	OTHER OPEN LANDS <RURAL>	4.3	0	0	0	0

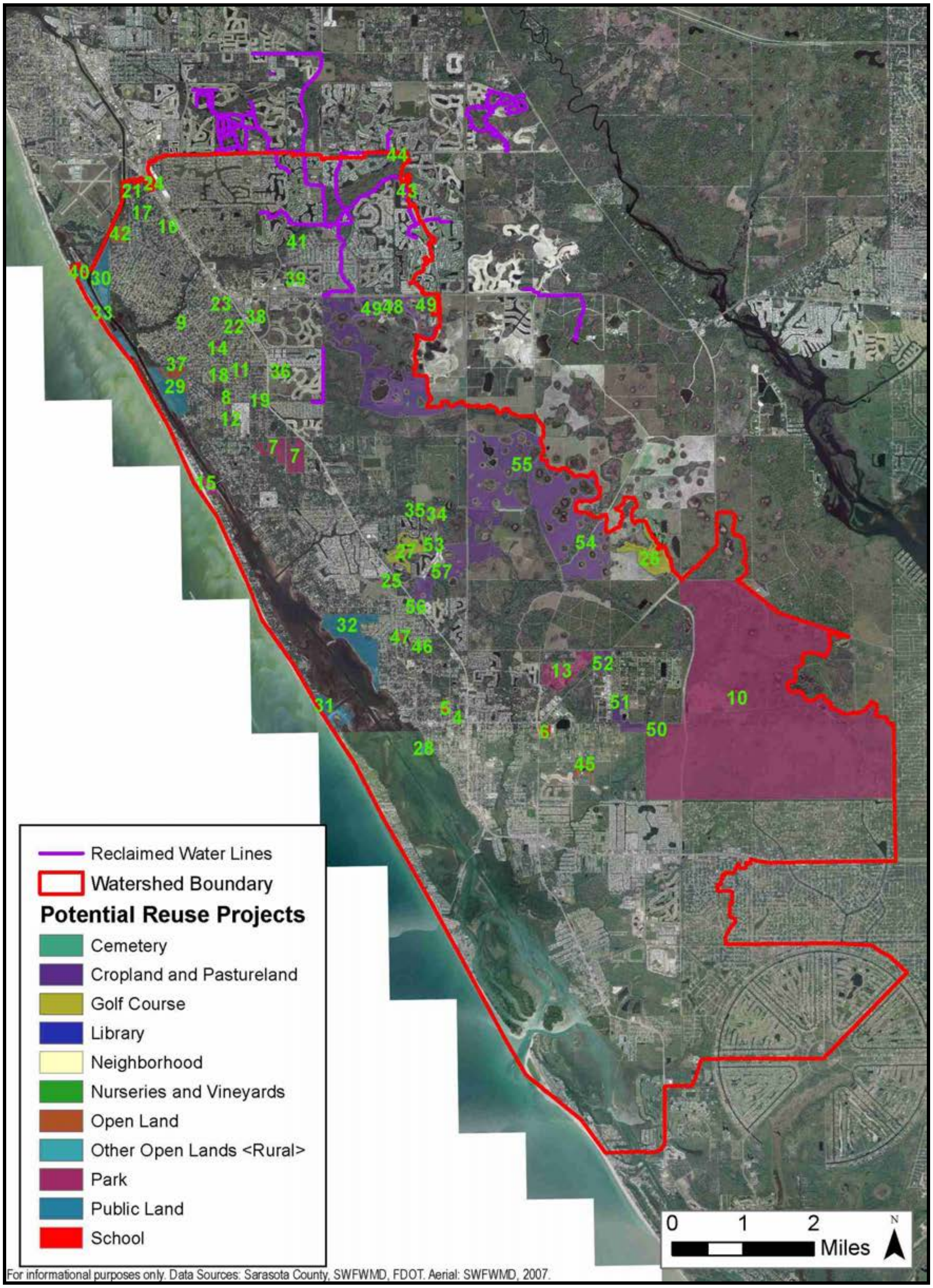

Figure 5-4 Location of Potential Subregional Stormwater-Harvesting Projects

5.2.3 Local-Scale Projects

Local-scale stormwater-harvesting projects typically consist of pond pumps, cisterns, or rain barrels that serve individual properties. Since local-scale stormwater-harvesting projects typically consist of construction on private property, the County is unlikely to participate directly in the construction of most of these projects. However, local-scale harvesting projects are still worthy of consideration since they provide the same potable-water offset, freshwater balance, and pollutant-loading reduction benefits as any other form of harvesting.

Photo: Hillsborough County Cistern, Courtesy of Jack Merriam, SC

In September 2009, Resolution 2009-178 was passed that allowed Sarasota County Water Resources to implement a rain barrel water conservation program by making rain barrels available for purchase to Sarasota County residents for wholesale cost of $37.00 each. The rain barrels provided are 55-gallon, food-grade quality, recycled polyethylene barrels. Harvested stormwater collected in the barrels is considered non-potable. To implement the program, Stormwater Environmental Utility staff partnered with UF/IFAS Sarasota County Extension (http://sarasota.extension.ufl.edu/FYN/Rainbarrel.shtml). The County Extension received grant funding from SWFWMD for a part-time Florida Yards and Neighborhoods Homeowner Outreach Educator for 1 year. Public education and workshops were scheduled for 2010. The following topics were included as part of public education to residents:

- ❖ Rainwater harvesting can reduce the use of potable water and provide cost savings on water and wastewater utility bills.
- ❖ Rain barrels help to reduce stormwater runoff by diverting and storing runoff from impervious areas such as roofs, decreasing the undesirable impacts of runoff.
- ❖ The use of rain barrels is a sustainable practice that serves as water conservation.

Regardless of the funding assistance provided, the local-scale projects will depend on how well the individual property owners maintain and operate their systems. A storage device that is never used for irrigation during dry periods is not a worthy investment.

In June 2009 the County Health Department implemented a procedure for converting abandoned septic tanks into cisterns based on 64E-6.011, FAC. This conversion allows a single-family residence to convert an abandoned septic tank to a cistern by permit within 90 days of connecting the building plumbing to sanitary sewer. Laboratory sampling and health department inspection are required for this procedure, and the water collected in the tank must be used for non-potable irrigation purposes only. Local-scale harvesting would be more cost-effective and provide a beneficial use for the large number of septic tanks that are no longer needed because of the septic tank phase-out program in this watershed.

Local-scale projects will vary in efficiency based on the amount of storage provided and how the stored water is used for beneficial purposes. Based on some typical values, an individual homeowner may achieve roughly a 5% reduction in average annual flows and loads by using rain barrels at each downspout on a guttered house. Although estimates for reductions using larger cisterns are more variable because of the differences in cistern sizes that may be applied, a reduction of approximately 15% for cisterns may be a reasonable value to use for planning purposes.

Potential regional and subregional scale projects were all assigned an LBWS## for consistency throughout this report. Local-scale stormwater-harvesting projects will collectively be identified in the analysis in this chapter and the Project Analysis (Chapter 8) as LBWS57.

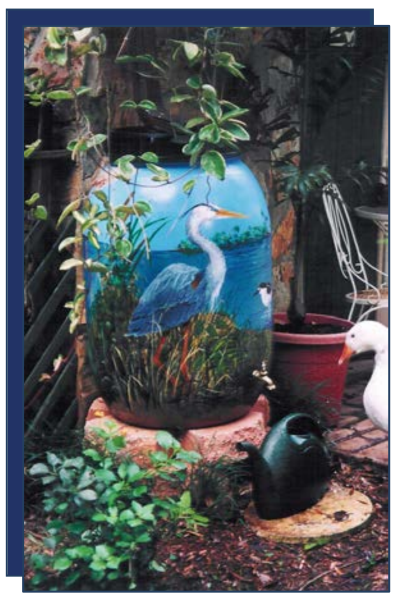

Photo: UF and Hillsborough County

5.3 RECOMMENDATIONS

Even though the benefits could be significant, none of the regional projects is recommended at this time for several reasons. First, the projects are in excess of the freshwater reduction goals needed for this watershed. Second, the end uses are uncertain and many may have a finite demand period. Third, many of the end uses may be served more cost-effectively through subregional harvesting. However, as land uses change in the future, these projects may be worthy of re-evaluation.

Jones Edmunds recommends stormwater harvesting for the six top-ranked subregional-scale projects shown in Figure 5-5 through 5-11. Estimates of average annual volumes and nitrogen reductions for the six projects are shown in Table 5-2. The Estimates of Probable Costs for construction for these projects as well as the estimated cost per million gallons of volume reduction of freshwater and the associated cost per pound of nitrogen removal from the system are provided in Tables 5-3.

Throughout the watershed, participation in local-scale stormwater-harvesting projects (LBWS57) through the public outreach and cost-savings program offered by Stormwater Environmental Utility and IFAS continuing through the end of 2010 is recommended. An evaluation at the end of the project will offer information on whether the program should move forward, be modified, or discontinued. The original rollout effort engaged the entire County, moving forward, targeting specific areas to improve education and continued usage of the alternative water supply.

In the future, a potential method the County could use to encourage and support local-scale rain barrel stormwater harvesting projects is through some form of funding assistance or homeowner rebate program.

One approach, which results in a lower amount of funding assistance, is to provide funding assistance to the local-scale projects based on a similar $/gallon harvesting rate that is achieved at the subregional scale. Depending on the assumptions used, this approach translates to approximately $1/gal of storage provided. This rate may be considered to be at the lower end of the range since it is taken from larger-scale projects that do not have as many constraints and that would have lower overall unit costs.

Another approach is to provide funding assistance at a rate similar to less feasible and more expensive neighborhood retrofit projects since that type of project would typically be needed in the areas where rain barrels would often be used to achieve similar benefits. Depending on the assumptions used, this approach translates to a rebate of up to $10/gal of storage provided. Thus, a range of possibilities exists for future funding assistance of ongoing local-scale harvesting projects.

Another local-scale recommendation is to encourage the septic-to-cistern process during the septic replacement/abandonment conversion. Active public outreach and education could assist homeowners in the permitting and testing phases of the process.

To further the sustainability goals set forth by the County in its policies, regulations, and comprehensive plan, reclaimed water and stormwater/rainwater harvesting should be used where possible to offset traditional sources used for irrigation such as potable water and groundwater. The County's comprehensive plan water policy 3.3.4 states:

"New development shall prioritize meeting irrigation needs through (1) demand management strategies, (2) reclaimed water, if available, (3) rain water or stormwater, and finally, (4) community ground water wells."

These types of strategies work well not only for new development but can be applied to private irrigation utilities, existing neighborhoods, and individual homes. For these measures to be effective, interagency cooperation is required at the state and local level to eliminate or incentivize the use of these alternatives as opposed to allowing individual groundwater wells as an alternative. One method that has proven to be successful has been establishing an irrigation utility at the beginning of a new development, constructing a central irrigation system, and limiting or prohibiting individual groundwater wells through deed restrictions. This structure requires an active management strategy and resource management to ensure that the type of water used follows the principles and hierarchy established by the water policy. Demand management strategies include limitations on the amount of water and time of day for irrigation, appropriate plant placement, and drought-tolerant plant selections. Also, demands have been adjusted by the changing community perspective with a general shift away from traditional lawns to a more natural landscape.

As examples, Lakewood Ranch, Stonybrook of Venice, and the Grand Paradiso communities were planned and developed with sustainable community principles. A development-wide piping system designed to supply reclaimed water and use stormwater harvesting to irrigate yards and common areas was installed during construction. A private irrigation utility was set up as a provider to administer and maintain the system and serve the customers. Community wells are used to supplement supplies when demands cannot be met through other means. The community wells also have meters to track the amount of groundwater used. Grand Paradiso has a development-wide restriction that does not allow private wells. Encouraging the establishment of private utilities and the prioritization and hierarchy for supplies can help the County achieve its sustainability goals as well as offset potable water demand.

Table 5-2 Recommended Stormwater-Harvesting Projects

Project ID	Description	Area (acres)	Distribution	Demand	Storage	Total	Approximate Average Annual Volume Reduction (acre-feet)	Approximate Average Annual Nitrogen Reduction (lbs)
LBWS13	PARK	137.4	2	3	2	11	92	299
LBWS26	GOLF COURSE	143.3	2	3	2	11	107	526
LBWS27	GOLF COURSE	93.7	2	3	2	11	70	344
LBWS04	LIBRARY	2.9	2	2	2	10	5	15
LBWS06	SCHOOL	18.0	2	2	2	10	30	113
LBWS23	PARK	9.2	1	2	2	8	6	20

Table 5-3 Summary of Estimates of Probable Cost

Project ID	Project Name	Project Cost*	Cost per Million Gallons Volume Reduction ($/MG)	Cost per Pound of Nitrogen Reduction ($/lb)
LBWS04	Elsie Quirk Library	$212,000	$130,000	$14,000
LBWS06	Heritage Christian Academy	$342,000	$35,000	$3,000
LBWS13	Englewood Sports Complex	$1,657,000	$55,000	$6,000
LBWS23	South Venice Park	$214,000	$109,000	$11,000
LBWS26	Myakka Pines Golf Club	$1,794,000	$51,000	$3,000
LBWS27	Boca Royale Golf and Country Club	$1,544,000	$68,000	$4,000

*Project costs include construction materials, engineering design services, survey, and geotechnical investigation.

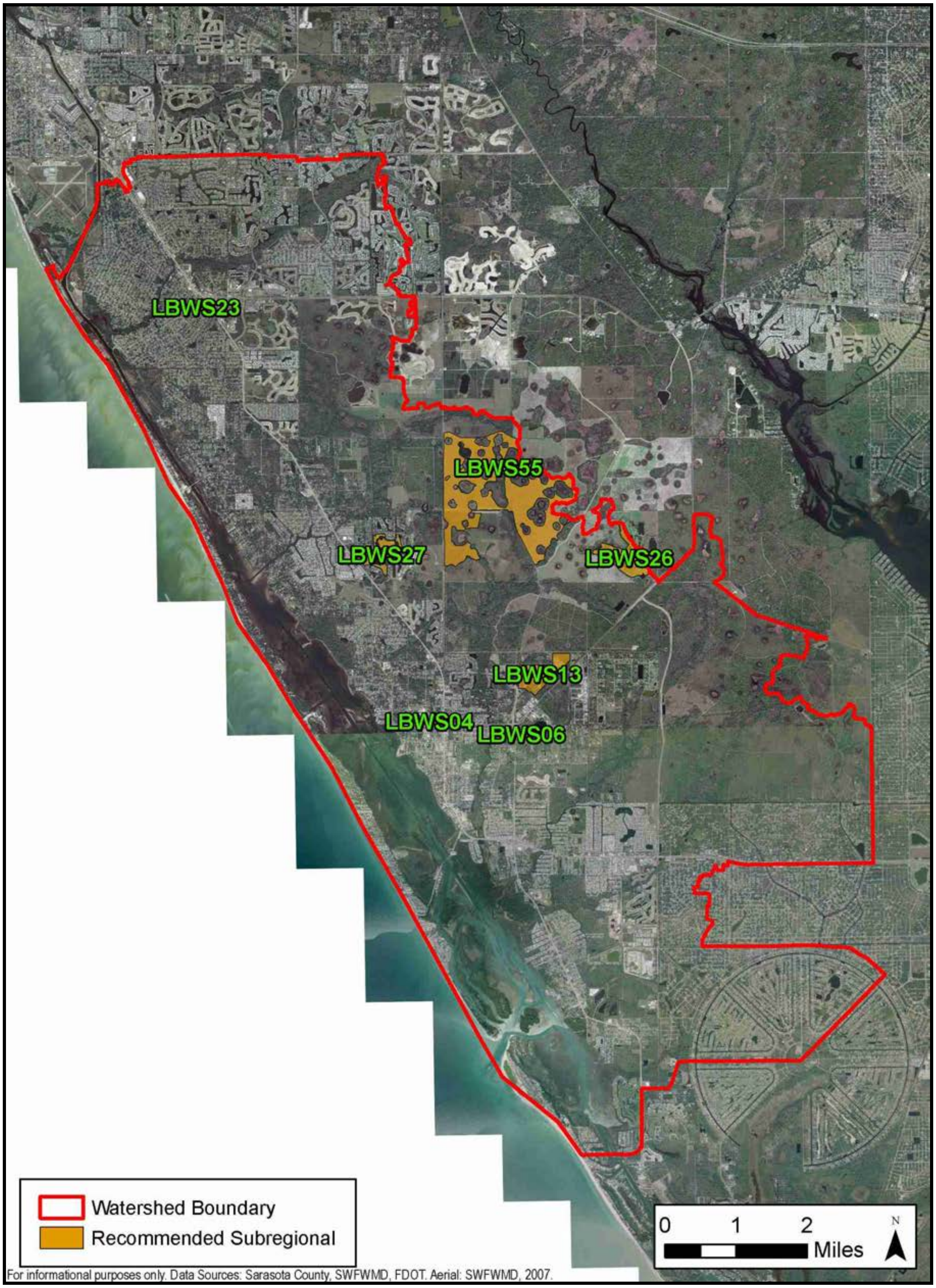

Figure 5-5 Recommended Subregional Stormwater-Harvesting Projects

Figure 5-6 LBWS04—Elsie Quirk Library

Figure 5-7 LBWS06—Heritage Christian Academy

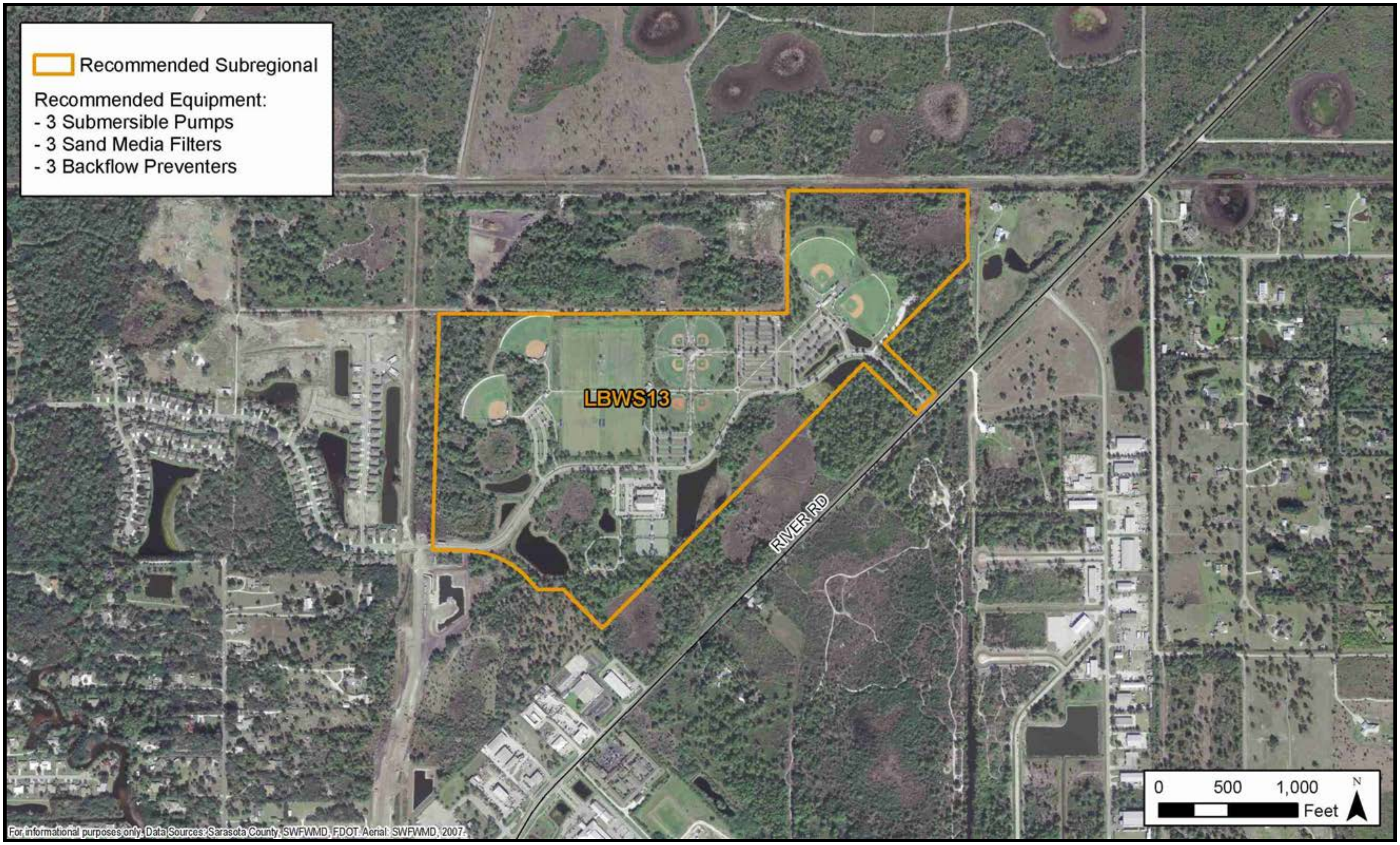

Figure 5-8 LBWS13—Englewood Sports Complex

Figure 5-9 LBWS23-South Venice Park #23

Figure 5-10 LBWS26—Myakka Pines Golf Club

Figure 5-11 LBWS27—Boca Royale Golf and Country Club