

# Sanibel Golf Course Fertilizer and Lake Management Recommendations Annual Report Card



October 2019

This report was specifically prepared for:

**Sanibel Island Golf Club**



## Introduction

Stormwater runoff from urban landscapes and golf courses is a major source of nutrients contributing to algae blooms and water quality impairments in Florida. Poor water quality not only impacts wildlife habitat and the quality of life for island residents, but it can directly impact our local economy by reducing property values and the overall experience of visitors to our island. As a result, protecting Sanibel's water quality is of paramount concern to the City of Sanibel.

The Florida Department of Environmental Protection (FDEP) is the state agency responsible for protecting Florida's waters. Waters that do not meet the state's water quality standards are deemed "impaired" under the Florida Impaired Waters Rule (Ch. 62-303, F.A.C.). To address these impairments, the FDEP is developing Total Maximum Daily Loads (TMDL) for each waterbody that does not meet minimum water quality standards. The TMDL is the maximum amount of a pollutant that a waterbody can assimilate on a daily basis without causing an imbalance in the natural flora and fauna. As part of the TMDL process, all local governments with impaired waterbodies within their jurisdiction will be required to participate in a Basin Management Action Plan (BMAP) process and will be required to address pollutant sources that are contributing to the impairment. In August 2017, the FDEP established a TMDL for the Sanibel Slough to address nutrient impairment in both the East and West Basins of the Slough system. To meet the target conditions set in the TMDL, a 26% reduction in existing total nitrogen (TN) loads and a 34% reduction in the existing total phosphorus (TP) loads are necessary in the West Basin. In the East Basin, a 54% reduction in existing TN loads and a 74% reduction in existing TP loads are necessary to achieve target conditions.

The City of Sanibel has taken several measures to improve water quality throughout the island. These measures include acquisition of environmentally sensitive lands, mangrove protection, native plant protection and sod limitations, beach and dune protection, conversion from septic to central sewer, responsible development through reductions in impervious surfaces and onsite stormwater management, implementation of the National Pollutant and Discharge Eliminations System Program, island-wide water quality monitoring, adoption of an urban fertilizer ordinance, and nutrient and lake management recommendations for golf courses. In June 2017, the City launched the Sanibel Communities for Clean Water (SCCW) program, which aims to educate residents in regards to the role they play in protecting water quality, and what actions they can take to improve

water quality in their community. While the City has taken a very proactive role in improving water quality, the Sanibel Slough and many residential and golf course lakes on Sanibel remain “impaired” for nutrients such as nitrogen and phosphorus. Managing stormwater runoff from golf courses on Sanibel is critical to ensuring that fertilizer and other chemicals used to maintain turfgrass do not inadvertently impact sensitive areas such as lakes, wetlands, and coastal waters. While we realize that each golf course is unique and was designed and permitted to function in a very specific way, all of the golf courses on Sanibel have the potential to discharge into natural waterbodies, either directly or indirectly. As a result, the City has taken additional measures to ensure that water leaving golf course lakes meet the water quality standards of the receiving waters.

In October 2008, in an effort to improve the quality of water discharged from Sanibel's golf courses, City Council adopted a list of Nutrient Management Recommendations that were based on the Florida Department of Environmental Protection's *Best Management Practices (BMPs) for the Enhancement of Environmental Quality on Florida Golf Courses (2008)*. These recommendations provide specific guidance for golf course managers on how to reduce fertilizer use and improve water quality within their respective golf course lakes. Since their adoption, City staff has worked closely with each golf course to provide technical assistance to help implement these recommendations.

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The City Natural Resources staff met with Club Owner Drew Donnelly and Superintendent Chad Kithcart of The Sanibel Island Golf Course in September 2019 to review the status of implementing the City's Golf Course Nutrient and Lake Management Recommendations. As a result of that meeting, the City has updated the annual “report card” for the Sanibel Island Golf Course.

A report card is provided annually to each golf course to help track progress and guide implementation of the City's recommendations. The report card uses a point system to evaluate performance. Each recommendation or best management practice (BMP) is scored from 0 to 5, based on the completeness of implementation. Out of 13 BMPs, a maximum of 65 points can be earned. The score is calculated as follows: 0–80%, Not in Compliance; 81–90%, Partially in Compliance; and 91–100%, Full Compliance.

The Sanibel Island Golf Club earned **56 out of 65 points**, for a score of **86%**. **This is a 60% improvement since 2013 (under new ownership), and a 19% increase from 2018.** The Sanibel Island Golf Club is “**Partially in Compliance**” with the City's BMP recommendations.

<b>BMP Matrix / Staff Recommendation</b>	<b>Score</b>
<b>Education</b>	
Require that each superintendent ensure that all course employees are trained in the <i>Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses</i> (FDEP 2007), including water quality related issues and environmentally sensitive areas around the golf course.	5
<b>Lake Management</b>	
Within 5 years of adoption, a minimum of 30% of the littoral zone of each golf course lake must be planted and maintained with submerged or emergent aquatic vegetation on a minimum of 3' centers.	3
Require that golf courses monitor the water quality in their lakes 2x/year (wet season/dry season) and provide the data to the City's Natural Resources Department. Minimum parameters should include dissolved oxygen (DO), total nitrogen (TN), total phosphorus (TP), chlorophyll a (chl-a), and copper (Cu). If nutrient or heavy metal concentrations are excessive, City staff will meet with golf course management staff to review and determine a mitigation plan.	2.5
Require that all fish kills and algae blooms are reported to the City's Natural Resources Department.	5
<b>Fertilizer Management</b>	
Limit soluble nitrogen applications to ½ lb/1,000ft <sup>2</sup>	5
Identify and map environmentally sensitive areas within the golf course and identify no fertilizer buffer zones around all of the waterbodies and map drainage patterns.	5
Require 25-foot native plant or unfertilized grass buffers around environmentally sensitive areas such as lakes and wetlands, where practical. When a 25-foot buffer is impractical, a minimum 10-foot buffer is required.	4
Require that grass buffers around environmentally sensitive areas such as lakes and wetlands be mowed 2" higher than the other grass to slow and filter overland flow to waterbodies.	5
Require that all washdown facilities have runoff properly treated prior to discharge off of the site.	3.5
Require periodic inspections of fertilizer storage areas and washdown facilities by DNR staff.	5
Require that all golf courses on the island maintain annual fertilizer and copper sulfate logs and make them available to the City's Natural Resources Department.	4
<b>Irrigation and Fertigation</b>	
Require that all reuse water be setback 25-feet from all waterbodies and that all irrigation heads using reuse water or fertigation (application of fertilizer through an irrigation system) be setback 25-feet from a waterbody. When a 25-foot buffer is impractical, a minimum 10-foot buffer is required.	4
Require that golf courses quantify their water use and differentiate between reuse and potable water supplies. This information can be used to account for the nutrients in reuse water when making fertilizer calculations.	5
Total Points (out of a maximum of 65 points):	<b>56</b>

### **Areas meeting the City's recommendations:**

1. *Best Management Practices training for golf course staff.* SIGC achieved compliance with the FDEP BMPs for Florida Golf Courses in January 2014. The program requires that all golf course employees be trained in the *Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses*. BMP training sessions were held regularly in 2015-2016, but no additional documentation of annual training was provided for 2017 or 2018. During this reporting period, BMP training was documented for 2019. SIGC should continue BMP trainings on an annual basis and ensure that annual training sessions include an emphasis on BMPs related to water quality and fertilizer management.
2. *Reporting of fish kills and algae blooms in golf course lakes.* No fish kills or algae blooms were reported over the past year. No algae blooms were observed in any of the golf course lakes or within the Sanibel River during the course inspection. Golf course staff should continue to identify and report all blooms to Natural Resources staff so that we may provide technical assistance on how to reduce possible nutrient sources and to mitigate future blooms.
3. *Limit soluble nitrogen applications to ½ lb N/1,000 ft<sup>2</sup>.* Golf course staff has indicated that applications of soluble nitrogen are limited to ½ lb N/1,000 ft<sup>2</sup>. This minimizes the potential for runoff of soluble nitrogen into lakes and subsequent availability to algae.
4. *Identify and map environmentally sensitive areas around golf course lakes.* Formal mapping was completed in May 2014. A map showing drainage patterns and all environmentally sensitive areas was provided to City staff on May 29, 2014.
5. *Require 25-foot native plant or unfertilized grass buffers or 10-foot buffers where 25-foot is impractical around environmentally sensitive areas.* At a minimum, 10-foot buffers have been established around most of the environmentally sensitive areas, including lakes and wetland areas. Additional buffers should be considered at edge of existing bulkheads.
6. *Require that grass buffers around environmentally sensitive areas such as lakes and wetlands be mowed 2" higher than other grass to slow and filter runoff.* Grass along the edge of lakes is allowed to grow to at least 2" higher than grass on greens, fairways and tees to help slow water and nutrient runoff. In most cases, the grass is allowed to grow much higher, aiding in filtration of runoff entering water bodies.
7. *Allow City staff to conduct periodic inspections of golf course facilities.* SIGC staff has provided full access to the golf course and all of its facilities for inspections. During the most recent inspection, all fertilizer and chemicals were properly stored and the maintenance facility appeared to be in good working order.

8. *Quantify golf course water use and the source of water used.* Sanibel Island Golf Club quantifies all water use. All water used to irrigate the course is reuse water provided by the City. From September 2018-August 2019, the average nightly irrigation was 225,451 gallons. This is a decrease of ~100,000 gallons from last reporting period, which may be attributed to recent updates and repairs to the irrigation systems (see #5 below).

**Areas needing improvement:**

1. *Water quality monitoring and reporting.* Water quality data should be collected on a semi-annual basis (wet season/dry season). SIGC conducted water quality monitoring of the golf course lakes just once in August 2019. While useful, semi-annual data would allow staff to better track water quality in the golf course lakes and can be combined with additional data collected by the City from the Sanibel River and data collected in conjunction with the City's Comprehensive Nutrient Management Plan.
2. *Maintain annual fertilizer and copper sulfate logs and make them available to the City's Natural Resources Department.* Records of fertilizer products, frequency and locations of application, and application rates for all fertilizer types were provided to the City; however, logs should also show fertilizer application totals for each product for the reporting year. Fertilizer logs are necessary to document nutrient applications for proper golf course management and environmental health. SIGC no longer uses any copper sulfate to control algae blooms in the golf course lakes.
3. *Planting of shoreline vegetation along golf course lakes to facilitate nutrient removal.* Within 5 years of adoption of the City's recommendations, all golf courses should have a minimum of 30% of the shoreline of each lake vegetated with submerged or emergent aquatic plants. Because aquatic shoreline vegetation is one of the easiest ways to remove nutrients, it is critical that lakes be vegetated and a maintenance program be implemented to harvest 10-20% of the mature plants annually to help facilitate nutrient removal. At this time, a majority of the Sanibel River is buffered with native wetland vegetation and emergent shoreline vegetation; however, the lakes within the golf course have little or no emergent or submerged aquatic vegetation. Additional efforts should be made to install vegetation along the shoreline of all golf course lakes (minimum of 30%). In locations where establishing submerged or emergent aquatic plants is not possible, a native shoreline buffer or other alternative planting options (e.g. floating treatment wetlands) should be pursued.
4. *Require that all irrigation heads using reuse water be set back 25' from all waterbodies or 10' where 25' is impractical.* The current irrigation design includes several heads that are located within 10' of golf course lakes and the Sanibel River. In 2014, SIGC replaced more than 25 full circle irrigation heads,

some less than 10' from waterbodies, with part circle heads. Over the past year, SIGC has been working diligently on the course's irrigation system. On the front nine, ten (10) irrigation heads have been moved further away from waterbodies to prevent over-spray, over a dozen irrigation heads have been upgraded with 180° spray heads, and some unnecessary heads (spray heads that were not providing irrigation to tees, greens, or fairways) have been shut off. These efforts will be mirrored on the back nine over the next year. These system updates should have a positive impact on water quality by reducing the amount of nutrient-rich reuse water applied to the course and limiting over-spray into waterbodies. Constant attention to the irrigation system is critical to significantly reduce the volume of nutrient-rich reuse water entering golf course lakes and the Sanibel River. Buffer plantings should also be considered to help reduce the potential for malfunctioning heads spraying into sensitive areas.

5. *Proper maintenance of washdown facilities and runoff.* The SIGC maintenance area was in good condition at the time of inspection. During the 2018 inspection, the washdown facility was in disrepair. The facility's washdown water was allowed to run off the pavement into an unvegetated swale. The nutrient water percolated down into the groundwater with little to no treatment. Over the last year, SIGC staff made some improvements to the washdown facility. The drainage ditch has been excavated to increase storage capacity, a grate has been added to edge of the concrete pad to remove large particulates from washdown water prior to discharge, and a vegetative buffer has been installed between the concrete pad and swale. Additional improvements are needed to elicit maximum treatment potential for the washdown facility.

#### **Status of Interim goals for 2018-2019 and Interim goals for 2019-2020:**

1. Implement semi-annual water quality monitoring in golf course lakes and provide the data to the City's Natural Resources Department. SIGC conducted water quality monitoring of the golf course lakes in August 2019, which is the first sampling conducted since September 2015.  
**PARTIALLY COMPLETED; REMAINS INTERIM GOAL FOR 2019-2020**
2. Maintain detailed fertilizer logs that identify the type and amount of fertilizer applied, location, and application dates. Efforts should be made to document application totals for each product for the reporting year. Fertilizer logs are necessary to document nutrient applications for proper golf course management and environmental health.  
**PARTIALLY COMPLETED; REMAINS INTERIM GOAL FOR 2019-2020**
3. Monitor and continue to treat Brazilian pepper regrowth from all areas of the golf course. The presence of Brazilian pepper on the property is a violation of the City's Brazilian Pepper Eradication Program. Removal of other invasive

exotic vegetation—including air potato, lead tree, exotic inkberry, oyster plant, umbrella tree, Christmas senna, and wedelia—is strongly recommended.

**PARTIALLY COMPLETED; REMAINS INTERIM GOAL FOR 2019-2020**

4. Continue to improve washdown facility to provide storage capacity and filtration for nutrient-rich washdown water. The current grate will suffice as a temporary fix, but a more permanent solution should be explored. Additional native vegetation should be installed around the water storage area to remove nutrients from the washdown water before entering the groundwater.

**PARTIALLY COMPLETED; REMAINS INTERIM GOAL FOR 2019-2020**

5. Install at least two areas (minimum 50-feet of shoreline) of submerged and emergent shoreline vegetation and transition at least two sections (minimum 50-feet in length) of shoreline from unmowed grass to native plant buffers. In 2013, SIGC ceased mowing the lake edges as an initial step in an improved lake management process. While this action was sufficient to bring SIGC into compliance with the specific report card recommendation, it was not intended as a substitute for the addition of submerged and emergent shoreline vegetation.

**NOT COMPLETED; REMAINS INTERIM GOAL FOR 2019-2020**

#### **Additional Noteworthy Efforts**

1. Over the past year, SIGC staff has removed approximately 2 acres of turfgrass around tee boxes. The removal of turfgrass results in a decrease in the amount of area on the course that would need to be fertilized, likely reducing the amount of nitrogen and phosphorus applied to the landscape. Furthermore, these are areas that are no longer being irrigated with nutrient-rich reuse water. SIGC has plans to continue to further reduce turfgrass areas. Since the turfgrass is being replaced with shell aggregate, the City would encourage some of these areas to be planted with native vegetation to slow down and intercept stormwater runoff.