



# An Introduction to the Position, Values and Benefits of Sustainability for the Golf Facility

*“Sustainability is about ensuring profitable businesses while making decisions that are in the long-term interest of the environment and communities. The focus is on continual improvement, professionally managing and conserving resources and inputs, and reducing waste while providing playing conditions that satisfy golfers of today and tomorrow.”*



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# Values and Benefits of Sustainability for Golf

## *Introduction*

Developing and understanding the business case for sustainability is critical for success in any type of business. The typical business case revolves around expenses and revenues. Successful environmental initiatives for the small business must incorporate tangible results due to ever increasing economic pressures and limited resources including time, manpower, equipment, materials, and funding. Progress is made by starting with small steps focusing on the low-hanging fruit, building momentum, experiencing success and then working toward continuous improvement.

Golf facilities are small businesses and should be considered valuable assets to any community.

Many initiatives within a small business are the result of a “champion” embracing them and inspiring others to try something different. It is important to foster an environment where an individual can engage their peers and encourage management to bring about change within select areas that improve operations. In terms of sustainability, the most successful efforts are through a team approach. When owners, managers, employees and ultimately, the clientele are engaged in the process, then short-term successes are more likely to turn into long-term benefits, including revenue generation and extended return on investments.

Generally recognized sustainability values and benefits include:

- Realized direct cost savings
- Increased customer loyalty and attraction
- Reduced risk and increase positive returns
- Improved relationships/image
- Improved overall branding
- Increased employee relations
- New or enhanced innovation or technologies

What can this mean to a golf facility?

Many of these values are supported in part by Audubon International’s publication, *Golf’s Green Bottom Line: Uncovering the Hidden Business Value of Environmental Stewardship on Golf Courses*. Based upon its data, surveys and experience, Audubon International lists the following corresponding values for golf courses within their report:

- Enhanced image and reputation
- Increased customer satisfaction
- Reduced costs
- Improved worker safety and reduced liabilities

Many golf facilities currently participate in golf-centric environmental stewardship programs that support the value and benefits of sustainability,

These include, but not limited to:

- Audubon International
- Michigan Environmental Stewardship Program
- Golf Environment Organization
- Southern Nevada Water Authority's programs
- Air Force GEM Program

In addition, many golf courses are incorporating recognized state (such as Georgia, Florida and Oregon) best management practices (BMPs) and are realizing economic, agronomic and environmental values.

Understanding these key values helps businesses adopt a sustainable business philosophy. There are common operational areas that businesses focus on as well to benefit the bottom line. These operational areas include water use, energy use, waste management, supply chain improvements, efficient processing of materials, and more. The focus includes an operational impact analysis as well as environmental impact analysis. In golf, environmental programs and BMPs from multiple states focus on these areas as well. Together, these focus areas and benefits help to create the sustainability business case for golf facilities.

This guide incorporates four key areas that a golf facility should focus on:

- water use: efficiency and conservation
- energy use: efficiency and conservation
- pollution prevention
- water quality protection

This guide highlights BMPs within each of these areas to help facilities set up their own strategies for improving their bottom line, contributing to their communities, advancing their image and protecting the environment. It offers practical tips on how to get started and offers success stories from golf facilities.

Leaders at golf facilities can use this information in conjunction with other resources, including access to BMPs and case studies from the Environmental Institute for Golf (EIFG) to develop their business case and sustainability plan. These online resources, coupled with environmental management programs or environmental management systems (EMS), are powerful tools for success at the facility. These are key elements of golf's sustainability initiative, Golf's Drive Toward Sustainability, which is geared toward success at the facility.

## *Golf's Drive Toward Sustainability*

### **Sustainability is about the “triple bottom line” – people, planet, and profit**

Golf's Drive Toward Sustainability was created to inspire a team approach at golf facilities, focused on four key environmental areas and commitment to continual improvement. Golf facilities can incorporate sustainable practices regardless of where they are with current efforts. The effort should never lose sight of the fact that it is a never ending goal. The term “sustainability” may be considered by some to be a vague and has been defined in a variety of ways. However, one of the most recognized definitions is through efforts of the United Nations. It has its roots in the 1987 World Commission on Environment and Development report, *Our Common Future*, also known as the Brundtland Report, which defines it as:

*"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."*

This definition incorporates the economic, human and environmental protection elements of sustainability.

Sustainability theories and models have been around for years, but unlike the term “green,” sustainability focuses on the “triple bottom line” to ensure businesses are successful. Regardless of which sustainability theory one adheres to, there are three key elements of a sustainability definition/position:

- (1) People: centered for people now and in the future
- (2) Planet: ecologically viable
- (3) Profit: economically feasible

Adopting a sustainable business philosophy is the incorporation of these three key elements into the decision-making processes.

Through collaboration of the EIFG, Golf 20/20 Environmental Committee and GCSAA's Environmental Programs Committee, a definition for the golf course industry was developed and reflects the key elements:

*The U.S. golf industry recognizes sustainability as the integration of environmental stewardship, social responsibility and economic viability as a critical and never-ending goal. The golf industry embraces sustainability as “meeting the needs of the present without compromising the ability of future generations to meet their own needs.”*

*Sustainability is about ensuring profitable businesses while making decisions that are in the long-term interest of the environment and communities. The focus is on continual*

*improvement, professionally managing and conserving resources and inputs, and reducing waste while providing playing conditions that satisfy golfers of today and tomorrow.*

## **Why Sustainability for Golf Facilities?**

Perhaps the biggest driver for the golf course industry to adopt sustainability centers on the facility's ability to do business. The golf course industry is in a state of change. Economic, environmental and regulatory pressures continue to rise. Regulations pertaining to water quality and water use are advancing. The costs of doing business are increasing. Resource restrictions, such as land and water use, will certainly increase with the growing population.

Water use restrictions and regulations are already common to Arizona, Nevada and Southern California. Water quality issues and regulations are prevalent in states like Wisconsin, Michigan, Vermont, Florida, California, and all of the states along the Chesapeake Bay. News headlines highlight environmental groups that are constantly filing law suits regarding the use of fertilizers and pesticides. Carbon, energy, and water issues will continue to make headlines. Sustainability experts label the business aspect of this pressure as "the license to do business." Social expectations for use of resources and regulatory actions are impacting golf's license to do business.

Consider the cost of doing business and the reduction in revenue that golf has faced since 2008. Efficiency has become more important than ever and will be in the future. How will golf handle these challenges, be profitable and provide valuable services for our communities? Embracing sustainability provides an answer to ensuring golf's future.

A golf facility can incorporate sustainable practices to help address the challenges that golf is facing. The following statements summarize six reasons why golf facilities should embrace sustainability:

- I. The game of golf is a sport and business that is rich in tradition and value. Golf facilities and their leaders should continue to hold high standards of performance as pillars within their communities.
- II. Golf facilities deliver significant values and benefits to their communities, including social (recreational, social interaction, etc.), economic (jobs, revenues, etc.), and environmental (greenspace values). These key values correspond directly with the key elements of sustainability: people, planet and profit. Sustainability provides the foundation to communicate golf's values.
- III. Many golf facilities are executing sustainable practices and simply need to document, report, and communicate those practices based upon an accepted and recognized platform – sustainability and continuous improvement. This will improve the image of golf as well as the brand for the individual facility.

- IV. A sustainability philosophy will position facilities and industry proactively and will help address environmental issues and regulatory pressures.
- V. A sustainability philosophy will help with financial pressures including revenue generation, efficiencies, and reduced costs.
- VI. A sustainability philosophy will help golf compete with other entertainment, recreation, and businesses that customers choose for leisure, hobby and sports interests.

## **Opportunities for Improving the Triple Bottom line**

### ***Water Use: Efficiency and Conservation***

Water is a key resource for golf facility operations and is used for managing golf playing surfaces for optimal performance and desired conditions to food and beverage services. It directly impacts operating costs and the ability to generate revenues. It is also a key impact area for the environment and community. Water management begins with measuring, tracking and analyzing water use. A baseline is necessary in order to set goals and make improvements in a manner that demonstrates efficiency and progressive water conservation.

Flexibility and innovation are important for all operations at the facility. Incorporating a range of BMPs can help modify behavior and adapt to new technology. One facility may be able to immediately incorporate a weather station and soil sensors, while another may only be able to modify irrigation practices. Kitchens, clubhouses, and pro shops may be equipped with technologically advanced equipment and staff may be trained to conserve water.

Short-term BMPs may range from hand watering, reducing watering times or volumes, voluntarily not serving water in restaurants, or not letting water run unnecessarily. Long-term practices may include the use of technology or converting to a different turf species. The facility should plan for both short- and long-term best management practices to achieve success. It should set water efficiency / conservation goals as initiatives in conjunction with their business objectives and playability standards. Achieving customer satisfaction can be accomplished in conjunction with sustainability initiatives through the use of BMPs and innovation for all golf facility operations.

### **Examples of water use efficiency and conservation:**

#### ***Barton Creek Resort and Spa's Water & Energy Reduction***

Barton Creek Club and Spa reported a savings of 20 to 40 percent in water/sewer costs associated with their laundry department's ozone treatment process. In addition, this sustainability practice resulted in a 30-percent reduction in natural gas usage and a reduction in chemicals by 20 to 30 percent. Details of their environmental responsibility are provided at [www.bartoncreek.com/sustainability](http://www.bartoncreek.com/sustainability).

### ***Irrigation System Review and Maintenance***

At the Rim Golf Club in Payson, Ariz., staff started with basic irrigation fundamentals incorporating field equipment adjustments, analyzing the central controller's programming, adjusting run times and reducing turfgrass areas. As a result, the facility reduced its average annual water usage over the past 10 years by 3 million gallons annually and its electricity consumption by an average of 250 kWh per year. It has realized a total estimated annual savings of \$17,000 associated with water conservation.

EIFG case study - "Water Conservation at The Rim Golf Club" can be found at [www.eifg.org](http://www.eifg.org).

### ***Water Savings Through Turfgrass Reduction***

Pasatiempo Golf Club in Santa Cruz, Calif., was facing mandatory water reductions in 2009. It was required to reduce their water consumption by 30 percent, which equated to a 17-million gallon reduction. The reduction would result in an annual savings of approximately \$125,000.

Staff implemented a turfgrass reduction program to meet its water use goals. By the 2009 playing season, nearly 20 acres of previously irrigated turfgrass had been converted to non-irrigated naturalized areas. Just over 13.5 million gallons of water were saved from mid-May to mid-September in 2009. This reduction in water saved the club approximately \$98,000 (during that time period). The conversion of turfgrass to non-turfgrass natural areas saved the club an additional amount of \$26,000 in labor and expenses.

EIFG case study - "Water Conservation in Response to Drought Has Many Positive Benefits" by GCSAA member Paul Chojnacky, golf course superintendent, can be found at [www.eifg.org](http://www.eifg.org).

### ***Implementing Irrigation and Cultural Best Management Practices***

The Locust Hill Country Club worked to reduce inputs while providing conditions suitable for one of golf's premier events, the LPGA Championship. During the first seven years of implementation of BMPs, it reduced both water and pesticide use by 75 percent, which resulted in a significant savings that was invested into seed and nutrients for turfgrass maintenance.

EIFG case study – "Accomplishing Turfgrass Performance with Best Management Practices" by Rick Slattery, golf course superintendent, can be found at [www.eifg.org](http://www.eifg.org)

### ***Energy Use: Efficiency and Conservation***

Managing energy is an important element of sustainability from its generation and use, to the social and environmental impacts. The costs associated with energy are on the rise directly impacting personal finances and indirectly increasing the costs of products and services used daily. Energy management begins with monitoring, recording and analyzing use. Energy conservation and efficiency can be accomplished through multiple best management practices that range from behavior modification to the use of technology. Energy audits help to identify opportunities, assess sustainability, calculate return on investments and develop a plan. Most



facilities may be able to immediately incorporate behavior modifications such as turning off lights or not letting equipment idle, while others may be able to immediately invest in energy efficient equipment.

Optimizing energy efficiency should be a primary goal of all departments at the golf facility. Many resources exist to help develop energy use plans and make improvements. Conducting an energy audit will identify short- and long-term items, but there are some simple techniques such as changing to high efficiency lighting that are obvious improvements.

### **Examples of energy use efficiency and conservation:**

#### ***Resort Implements a Green Team and a “when not in use, cut the juice” initiative***

Madden’s on Gull Lake in Brainerd, Minn., is a *Golf Digest’s* 2010 Green Star Award winner. Ron Whitten reports in his article, “Environmental Practices at Madden’s on Gull Lake make sense (and cents)”, that staff members were directed to turn off lights in unoccupied rooms as part of the resort’s environmental stewardship practices. Whitten quotes Brian Thuringer, co-owner, “Thuringer’s mantra, ‘When not in use, cut the juice,’ resulted in a savings of \$32,000 in the first year.” In addition, the resort experienced a \$15,000 savings in the first year in natural gas consumption by implementing an ozone system within the laundry facility.

#### ***Energy Audit and Lighting Improvements that Directly Impact the Bottom Line***

GCSAA member David Phipps, superintendent at Stone Creek Golf Club in Oregon City, Ore., contacted the local power company, Portland General Electric, to request a free lighting audit. The auditor determined that Stone Creek could save 38,875 kWh or 52 percent by converting to more efficient lighting. In addition, the use of occupancy sensors would increase the savings to 56 percent. The club obtained local grant monies and completed the proposed project. During June 2010, the clubhouse saved 11.4 percent in power costs and the maintenance facility realized 26.8 percent savings. The savings associated with the cart barn was 29.8 percent in June, as well. The club just purchased a new fleet of E-Z-GO golf cars which came with the new 48 VDC Powerwise chargers and contributed to this savings.

EIFG case study – “Improving the Bottom Line with Sustainable Practices; Cutting costs with energy efficient upgrades” by GCSAA member David Phipps, golf course superintendent, can be found at [www.eifg.org](http://www.eifg.org)

#### ***Energy Audit and Alternative Energy Projects***

The Island Golf Club in Plaquemine, La., performed an energy audit and worked on implementing the “low hanging fruit” for energy conservation. The facility installed solar panels and geothermal projects to improve savings. As of November 2009, there had been an estimated 54 percent reduction in utility costs at the club house equating to approximately \$5,000 per month. The investment was approximately \$252,000 for the solar panels and \$90,000 for the geothermal unit project. Many tax incentives exist for alternative projects like these. The projected return on investment for these projects is less than eight years for the solar project and six years for the geothermal unit.

EIFG case study – “Improving the Bottom Line: Alternative Energy and Conservation at The Island Golf Club” by GCSAA member David McCallum, golf course superintendent, can be found at [www.eifg.org](http://www.eifg.org).

### ***Review Turfgrass Areas and Mowing Practices***

Crystal Mountain Resort and Spa in Thomsanville, Mich., reduced fuel consumption by using walk mowers on the Mountain Ridge course rather than a tri-plex mower. They narrowed the fairways on each golf course, which also helped reduce fuel consumption. This adjustment did not adversely affect the courses’ playability or aesthetics. The estimated annual savings has been \$4,000 to \$5,000, including fuel and other inputs.

EIFG case study – “Environmental Stewardship at Crystal Mountain Resort and Spa” can be found at [www.eifg.org](http://www.eifg.org).

### ***Golf Course Energy Use Series***

Chiricachua Golf Course at The Desert Mountain Club in Scottsdale, Ariz., participated in an energy conservation program. In 2006, energy costs on the Chiricachua Golf Course at the Desert Mountain Club had risen 40 percent from 2004; an increase of \$10,000.

Changes implemented included:

- Instituted a kilowatt demand management plan for how and when the golf course pumped its water
- Reduced the kilowatt demand by taking some pumps completely offline during periods of the year
- Programmed system to stage pumping, minimizing multiple pumps running at the same time
- Increased the length of the golf course watering window

The efforts resulted in a reduction in energy use by 27 percent (billing rates increased 20 percent during the same period).” (From “Golf course energy use Part 2: Pump stations,” *GCM* July 2009)

### ***Pollution Prevention***

Pollution prevention incorporates many facets of golf facility operations from the products used, waste materials generated, to processes like cooking, cleaning, and building operations. Some golf operations and wastes are regulated and costly, but sustainable practices can be implemented to improve the triple bottom line. The following section focuses on the infrastructure, operations, and waste management and the water quality protection section focuses on the golf course inputs.

Like water and energy management BMPs, pollution prevention practices range from training and behavioral practices to the incorporation of technology. Changing from “wet cleaning” practices to “dry cleaning” practices or purchasing environmentally friendly products are examples of the “low hanging fruit” of BMPs and short-term objectives. Installing a new equipment washing station or updated kitchen equipment are examples of long-term planning objectives.

## **Examples of pollution prevention:**

### ***Recycling and Waste Management as Part of Environmental Stewardship Practices*** **Crystal Springs Golf Course**

Crystal Springs Golf Course is located within an environmentally sensitive area in Burlingame, California and has set several environmental goals including recycling and waste reduction. They are working to obtain their goals through the implementation of best management practices. CSGC staff members actively recycle many materials, including cardboard, paper, plastic and metals. They have altered their purchasing programs to seek products that generate less waste. Their annual estimated savings associated with recycling and waste reduction is \$5,300. CSGC was recognized in 1998 through a Waste Reduction Awards Program from the California Waste Management Board.

More details can be found within the EIFG case study – “Environmental Stewardship on the Golf Course Doesn’t Just Happen” by GCSAA member Tim Powers, CGCS at [www.eifg.org](http://www.eifg.org).

### **Little River Inn Golf and Tennis Resort**

Maintenance staff at the Little River Inn Golf and Tennis Resort in Little River, Calif., implemented a waste recycling program. Staff recycles bottles, cans, oils, fluids, etc. and composts materials from throughout the facility. Little River’s combined and estimated annual savings / net revenue from recycling and composting is \$2,400.

EIFG case study – “Water Conservation, Environmental Stewardship, and Outreach Efforts at Little River Inn Golf and Tennis Resort” by GCSAA member Terry Stratton, golf course superintendent, can be found at [www.eifg.org](http://www.eifg.org).

### ***Composting on the Golf Course***

Saddle Rock Golf Course in Aurora, Colo., developed a composting process, and the materials used included clipping compost material and other compostable green waste. Annually, the composting process generated approximately 80 cubic yards of compost that is eventually used to topdress tees, fairways and other areas on the golf course. Overall, it provided a quality topdressing material for weak and healthy turf areas on the golf course when used at an appropriate rate.

EIFG case study – “Composting Case Study Saddle Rock Golf Course” can be found at [www.eifg.org](http://www.eifg.org)

## ***Water Quality Protection***

Key elements for water quality protection include, but are not limited to, IPM, nutrient management, erosion control, and managing waste water. There are many resources and best management practices available regarding water quality protection for the golf course, impervious services, hospitality services, buildings, etc.

Golf facilities are faced with increasing regulatory and economic pressures directly related to water quality protection and this trend will continue. Recognizing the sustainability business case values in light of water quality protection is important for the golf facility and the industry. Water quality protection is a primary focus of the “license to do business” and provide services for the communities in which golf operates.

### **Examples of water quality protection:**

#### ***Community, Collaboration, Watershed and Habitat Improvement, and Erosion Control***

Crosswater Club in Sunriver, Ore., was an old homestead where cattle had grazed upon the grounds for many years. The cattle caused considerable damage, including soil erosion and destruction of native vegetation, to the meadow and especially to the banks of the Little Deschutes River. Crosswater Club participated in a habitat improvement program that consisted of three different bio-remediation techniques: river bank improvement and stabilization, dead tree placements, and riffle restoration. The project provided a good enhancement to the watershed and Crosswater is a valuable greenspace within the watershed.

EIFG case Study – “Little Deschutes River Restoration and Fish Habitat Enhancement at Crosswater” by GCSAA member Jim Ramey, CGCS, can be found at [www.eifg.org](http://www.eifg.org).

#### ***Watershed Participation, Recognition, and Certification – Best Management Practices***

Quail Brook Golf Course, Somerset, N.J., was certified as the first “river-friendly” course in the main stem Raritan River area. The certification process involved four major categories:

- Water quality management
- Water conservation techniques
- Wildlife and habitat enhancement
- Education and outreach

Part of its efforts included incorporating buffer areas and converting turfgrass areas into natural areas. As a result, there was a 25-percent savings in fertilizer and only 45 percent of its annual water allocation was used.

EIFG case study – “Quail Brook Golf Course: First River-Friendly Golf Course in the Main Stem of the Raritan River Basin” by GCSAA member Darrell Marcinek, CGCS, can be found at [www.eifg.org](http://www.eifg.org).

# Environmental Programs

## *The Path to Success*

Environmental management programs, such as Audubon International, Golf Environment Organization, Michigan Turfgrass Environmental Stewardship Program, and environmental management systems (EMS) like ePar, are available to help plan and meet objectives. These are golf-centric tools that incorporate most, if not all, of the key focus areas and BMPs. In addition, these programs can provide a plan, an organized system for establishing objectives, a method of measuring progress, and a system of accountability, as well as step-by-step information to help facilities advance in sustainability. Many are based upon the successful total quality management's "plan-do-check-act" model.

Incorporating both short- and long-term objectives are important, as well as determining the return on investment for the facility. Utilizing a golf-centric environmental management program and/or EMS in conjunction with recognized BMPs will help establish, manage and achieve these objectives. Getting started usually begins with an environmental assessment which is an important first step in determining risks and opportunities, as well as developing the objectives.

Once the assessment has been completed, then the facility can progress toward establishing specific objectives and initiatives. Short-term initiatives can include behavioral changes, training, or a change in cultural practices. Long-term initiatives may have an initial cost or extended return on investment (ROI), but the facility should consider those perceived intangible values such as image, brand, member retention, competitiveness, and employee relations as part of the ROI. Reviewing existing resources can help a facility plan and select objectives that are compatible with its unique circumstances.

The Golf Course Superintendents Association of America through funding from the Environmental Institute for Golf provides access to golf-centric environmental management tools and additional materials, like case studies, BMPs and other sustainability resources for businesses. Additional resources and information can supplement the environmental management program for other aspects of the golf facility. These resources may have a specific focus. Resources like the EPA's Portfolio Manager or the U.S. Green Building Council's LEED program can help with energy management, efficiency, and conservation. Once a golf facility has progressed with a golf-centric program, it may utilize other resources or a combination of resources and programs to ensure continuous improvement. In addition, non-golf-centric certification and/or recognition are valuable.

Participating in a golf centric program often establishes the foundation for other environmental programs that a facility may find valuable. For example, a golf facility that has received certification in Audubon International's Certified Cooperative Sanctuary Program will probably have accomplished most of a local watershed program's requirements. Recognition and certification by the local watershed helps to promote the facility's value outside of the golf

community. Watershed organizations can be easily identified through the EPA's watershed tool, Surf Your Watershed.

### *Environmental Program Quick Reference*

<b>Resource</b>	<b>Golf Course</b>	<b>Maintenance Building</b>	<b>other amenities*</b>	<b>WC</b>	<b>EC</b>	<b>P2</b>	<b>WQP</b>	<b>Certification Available</b>
Audubon International	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Golf Environment Organization	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Michigan Turfgrass Environmental Stewardship Program	<b>X</b>	<b>X</b>		<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>
Groundwater Guardian Green Site	<b>X</b>	<b>X</b>		<b>X</b>			<b>X</b>	<b>X</b>
ePar – ISO 14001 EMS	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Rhode Island Golf Course Green Certification	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Vermont Program	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
USGBC LEED <sup>#</sup>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
EPA Energy Portfolio Manager <sup>#</sup>		<b>X</b>	<b>X</b>		<b>X</b>			

WC = Water Conservation, EC = Energy Conservation, P2 = Pollution Prevention and WQP = Water Quality Protection

\* Other amenities include clubhouse, pro-shop, etc.

<sup>#</sup> Not golf-centric, but applicable

## *Golf Course Environmental Profile*

In 2006, the Golf Course Superintendents Association of America (GCSAA) conducted the first in a series of five surveys to determine the physical features of golf courses, maintenance practices used by superintendents, and inputs and outputs associated with golf course management. The goal of the research is to develop an environmental profile of golf courses.

GCSAA and the golf industry need information specific to the environmental attributes of golf courses, including natural resource inventories, management inputs and environmental stewardship practices. This information will provide baseline data for documenting changes in environmental practices over time and help set priorities for education, research, member services and other environmental programs. The data will also help the golf industry respond to governmental inquiries and answer the public's questions about environmental issues. Existing environmental data are very limited, and not complete, uniform or centralized.

Using the results of the profile surveys, GCSAA identified the following conclusions for continuous improvement within the golf course industry:

### **Environmental Improvements – Environmental Programs**

- On average, over the last 10 years, an 18-hole golf course has made five environmental improvements.
- Approximately 29 percent of 18-hole golf courses are involved in a formal, voluntary environmental stewardship program.
- Facilities involved in formal, voluntary environmental programs have made an average of seven improvements to enhance the golf course environment in that 10-year period.
- The data suggests that such programs are having a positive impact on the golf course environment.

### **Non-Turfgrass Acreage**

- The non-turfgrass landscape on golf courses is substantial and can make an important contribution to green space and wildlife habitats for local communities.
- Non-turfgrass landscape of an average 18-hole golf course is 50 acres, including 35 acres of elements such as forests, wetlands, ponds, streams or other specialized habitats.
- Facilities have the opportunity and the responsibility to maintain these areas in a sustainable manner to further enhance the environmental qualities of a golf facility.

### **Irrigation Water Management and Conservation**

- Superintendents at nearly all 18-hole golf facilities utilize information from multiple sources as part of their decision-making process for scheduling irrigation. Most facilities utilize direct observations of turfgrass and soil conditions.

- Approximately 35 percent routinely utilize evapotranspiration data, and approximately 3 percent use soil moisture sensors to aid in irrigation scheduling.
- Golf course superintendents should take advantage of technology as part of the irrigation decision-making process to conserve water.

### **Irrigation Water Sources**

- Golf facilities utilize multiple water sources for irrigation, and the most commonly used water sources for 18-hole golf facilities are listed below.
- Golf courses should maximize the use of non-potable water to irrigate golf courses when economically and practically feasible.
- Most golf course facilities utilize open water or on-site irrigation wells as a source for water.
- Approximately 12 percent of golf facilities utilize recycled water as a source for irrigation water and 14 percent use potable water from a municipal source for irrigation.
  - 52% – open water (lakes, ponds, etc.)
  - 46% – on-site wells
  - 17% – rivers, streams and creeks
  - 14% – municipal water systems
  - 12% – recycled water

### **Irrigation Systems and Audits**

- Golf facilities should utilize irrigation system audits as a means to increase the effectiveness of the irrigation system and conserve water.
- Approximately 8 percent of 18-hole golf facilities nationally have had their irrigation systems audited by a certified irrigation auditor since 2001.
- More golf course facilities should take advantage of an irrigation system audit to become more responsible users of water.

### **Written Drought Management Plans**

- A written drought management plan provides a documented procedure to reduce the use of irrigation water during drought. These written plans are a helpful tool for individual golf facilities and are valuable for the golf industry in developing practical public policy at the local and state level.
- Approximately 28 percent of 18-hole golf facilities in the Northeast agronomic region have written drought management plans, more than any other agronomic region.
- Written drought management plans should be adopted by golf facilities that are subject to drought cycles.



## **Environmental Stewardship – Nutrient Management**

- The results of the nutrient use survey indicate that golf course superintendents use a variety of nutrient sources. Quick-release and slow-release nitrogen sources and synthetic and organic nutrient sources are applied to most golf courses in the U.S.
- No matter the nitrogen source (quick- or slow-release, synthetic or organic), superintendents decide the rate applied, the frequency of application, the time of year applications are made and the product used and are therefore responsible for producing the desired affect on the turfgrass without negatively affecting the environment.
- GCSAA recommends that superintendents evaluate all sources of nutrients based on their agronomic performance, cost, potential impact on water quality and other environmental concerns and choose products that foster sustainability of the golf facility.
- By itself, the source of nutrients (quick-release, slow-release, synthetic, organic) is not an indicator of the environmental stewardship of the golf facility.
- The potential for nutrients to move from the application site is influenced by application rate, frequency of application, time of year, product applied, soil type, soil moisture content, temperature, turfgrass density and the intensity and amount of rainfall/irrigation following application.
- Understanding and adjusting to the influence of these factors is the responsibility of a golf course superintendent.

## **Soil Testing**

- Since 2002, only 26 percent of 18-hole golf facilities have conducted soil tests on the rough.
- On an average 18-hole golf facility, the rough comprises 50 acres (4), more than any other component of a golf course.
- Since the greatest total amount of phosphate and potash are applied to rough, GCSAA recommends that superintendents routinely conduct soil tests on the rough to determine phosphorus and potassium fertilizer needs.
- This practice has the potential to curtail costs and promote fertilizer programs that meet, not exceed, the nutritional needs of the turfgrass.

## **Fertilizer Storage**

- In 2006, 50 percent of the 18-hole golf facilities that stored fertilizer for more than three consecutive days used a dedicated storage area.
- GCSAA recommends that all golf facilities that store fertilizer do so in an area that is specifically designed for that purpose.

## **Nutrient Management Plans**

- Approximately 50 percent of golf facilities nationally use a written nutrient management plan or a written fertilizer program.

- A written nutrient management plan or a written fertilizer program provides the means to achieve goals and should be used by all golf facilities.
- GCSAA recommends that all golf facilities use guidelines developed by university scientists to develop written nutrient management plans based on the characteristics and expectations unique to each facility.

## Quick Start Points

### *General Facility Practices*

1. *Identify a champion:* Build an effective team across departments. Task an employee who desires to make a difference and is motivated by sustainability initiatives as the team leader, project manager, or simply, the “go to” person to ensure success. This is an important aspect in the beginning, as well as throughout the process. The champions need to be supported by management and be able to build “green teams” within all facility operations.
2. *Establish an environmental/sustainability policy:* Develop and implement a written policy to support the initiative and to help communicate the sincerity, importance and commitment of management toward sustainability. It drives change.
3. *Implement the means to measure key metrics:* Collect and monitor data or other quantifiable information in order to establish a baseline of resource use or waste generation. This is vital to setting goals, measure change, calculate savings/costs and to report results.
  - a. Track inputs such as water, energy, and quantifiable resources, expenses and labor.
  - b. Incorporate the purchasing/supply system and waste stream materials for all operations within reviews and tracking processes.
4. *Establish written sustainability goals:* Identify and quantify desired change through goals and action plans in order to provide the road map to success, as well as the means to document and communicate the facility’s sustainability efforts.

### *Basic Risk Management*

1. *Ensure regulatory compliance:* Identify all operational requirements and ensure compliance throughout the facility. Key items include chemical storage, spill response, waste management, employee protection, and permitting requirements.
2. *Train employees to meet and exceed requirements:* Ensure employees are properly trained to meet any regulatory requirements, proper equipment operations, and safety related practices. Implement awareness training for environmental and personal protection for all operations.
3. *Utilize risk management assessment and practices:* Review operations for all human and environmental risks or impacts. Implement BMPs to resolve significant issues in a timely manner.

## *Water Use*

1. *Audit and maintain plumbing and irrigation system:* Ensure efficient irrigation operations by incorporating an irrigation audit and daily irrigation system maintenance program. Adopt similar maintenance schedules and programs for the entire facility's plumbing and water utilities.
2. *Optimize irrigated turfgrass areas:* Review all areas that are currently irrigated, including out-of-play areas, and implement steps to optimize irrigated and/or turfgrass acreage for performance and play at the golf facility. Consider that turfgrass areas may be reduced and provide a quality and enjoyable experience.
3. *Incorporate technology into irrigation decision making:* Implement short-term goals and utilize long-term planning to incorporate the use of technology; weather stations, rain sensors, soil sensors, irrigation fixtures, nozzles, quick couplers, control systems etc. to improve efficiency, enhance playing conditions, and conserve water.
4. *Utilize water efficient technology and equipment:* Implement short-term goals and utilize long-term planning to incorporate the use of water efficient equipment, controls, pumps, etc. throughout the facility and not just the irrigation system.
5. *Manage the existing golf course conditions and golfer expectations to drive and implement change toward "firm and fast" conditions:* Review current agronomic and irrigation practices and begin to implement change through both short-term and long-term planning to ensure more sustainable performance and healthy turfgrass.

## *Water Quality Protection*

1. *Develop and use a written IPM plan:* Implement a written Integrated Pest Management (IPM) Plan that establishes the pest thresholds, as well as the scouting, cultural, and pest management practices to help ensure healthy turfgrass as well as efficient operations and environmental protection.
2. *Develop and use a written nutrient management plan:* Implement a written nutrient management plan that incorporates university recommendations, soil/tissue testing, and BMPs to help ensure healthy turfgrass, as well as efficient operations and environmental protection.
3. *Implement BMPs for cleaning equipment and impervious surfaces:* Change wet cleaning processes to dry cleaning processes wherever possible and implement the use of technology and BMPs as standard operating practices for washing / cleaning all equipment and surfaces as well as processing the resulting wastes and wastewater throughout the facility to minimize environmental impacts and reduce expenses.

4. *Protect surface and groundwater with vegetative buffers and agronomic BMPs:* Plan and implement vegetative buffers adjacent to surface waters and wells in addition to no-spray zones to prevent contamination.

### ***Energy Use***

1. *Conduct an energy audit:* Use an energy audit to identify areas in need of improvement and establish goals to effectively use or reduce energy and the facility's carbon footprint.
2. *Improve irrigation pump efficiency:* Irrigation pumps can account for the most energy used at a golf facility and can be one of the largest opportunities to save money and protect the environment. Review pumps, controllers, run times and irrigation needs for more efficient operations and implement necessary changes.
3. *Conserve energy or improve efficiency by reviewing equipment, operations, and human behavior to implement change:* Review all operations at the golf facility to identify where equipment can be better maintained, upgraded, replaced or eliminated as well as where behavioral or operational aspects can save energy.

### ***Pollution Prevention***

1. *Evaluate supplies and suppliers for opportunities to reduce pollution:* Investigate the supply chain; products, materials, suppliers, manufacturing processes, wastes, packaging, transportation etc. and implement practical changes to minimize greenhouse gas impacts, reduce pollution and conserve resources.
2. *Professionally manage wastes at the golf facility:* Track the generation and disposal of all wastes; organic, inorganic, wastewater, equipment washing, etc. Implement recycling, reduction and reuse BMPs as standard operating practices. Set goals to minimize waste volumes and pollution to save money and protect the environment.
3. *Implement spill prevention and response practices across the entire facility:* Identify all activities with "spill potential" and implement awareness, response training, and BMPs as standard operating procedures for spill prevention and response for all employees. Utilize a written spill prevention and response plan.
4. *Ensure proper storage and inventory control:* Store chemicals and hazardous materials in an area that is specifically designed for that purpose.

## Moving Forward

Adopting a sustainability business philosophy shouldn't be awkward or troubling. It may help to first identify a champion and identify how this philosophy could be embraced throughout all aspects of the golf facility. Next, investigate how a sustainable philosophy could be aligned with the existing core business values and customer expectations for performance and quality.

Once you have committed to making progress, a key step is to establish an environmental policy statement. It helps to demonstrate management's commitment to sustainability and continuous improvement. Environmental policies should be simple and easy to understand. There are three primary elements that should be part of an environmental policy. They include compliance, continuous improvement, and pollution prevention. Many golf facilities probably have unwritten policies or are already supporting what a formal policy would describe. Some example environmental policies are included below.

This document provides a basic introduction, understanding, business case foundation and starting points for adopting a sustainability philosophy. It also provides some examples and additional resources to evaluate your existing stewardship practices.

This information is intended to help facility staff get started and begin with small steps – working from where you are and with what you have. It is always a good idea to begin with the “low-hanging fruit” in any operation. Use the quick start points in this document as a means to evaluate your operation. You can easily identify areas where you are already active and where you could expand your efforts. Be sure to measure what you are currently doing so you can track progress. The old adage that you can't manage what you can't measure applies directly to sustainability efforts.

After the initial evaluation, staff should set goals and develop an action plan. Sustainability goals should be realistic and easy to understand. Be sure to incorporate plenty of flexibility in your plan, monitor progress and continuously evaluate the plan and processes. Finally, consider a voluntary environmental stewardship program to help you with your efforts. There are several available within the golf sector. Information within this document can help to identify which one might be best suited to your operation.

The following are pages examples of environmental policies and goals. These are intended to help you get started or to supplement your existing efforts.

**Example #1:** Vermont Business Environmental Partnership – Green Links

The Vermont Department of Environmental Conservation and Small Business Development Center offer a Vermont Business Environmental Partnership (VBEP) program for golf facilities and it is called the Green Links program. The program incorporates an environmental policy statement. Here is a draft statement for the VBEP program:

Sample Vermont Business Environmental Partner Policy Statement

“(Business name here), is committed to protecting the environment, the health and safety of our employees, and the community in which we conduct our business. It is our policy to seek improvements throughout our business operations to lessen our impact on the local and global environment by conserving energy, water, and other natural resources; reducing waste generation; recycling and purchasing recycled products; and, reducing our use of toxic products. We are committed to pollution prevention, continual improvement and meeting or exceeding environmental all regulatory requirements.

Note: You may adopt this policy statement verbatim or modify it to reflect your unique business situation and philosophy. Any modification should, however, include at minimum the 3 core commitments of ISO-14001 EMS to: pollution prevention, continual improvement, and compliance with all state and federal regulations.”

Vermont Business Environmental Partnership, Standards, *Sample Vermont Business Environmental Partner Policy Statement*, viewed on September 19, 2011, <http://www.vbep.org/standards.html> Note: VBEP provides this service to golf facilities, hotels, and restaurants within Vermont.

**Example #2:** Stone Creek Golf Club - Policy Statement



**STONE CREEK GOLF CLUB**  
**ENVIRONMENTAL POLICY**



Stone Creek Golf Club operates, manages and maintains a 18 hole championship golf course and club house facilities for the enjoyment of its guests. Located in Oregon City, the course covers over 140 acres of open grassland and wooded coniferous forest. Stone Creek Golf club provides a challenge for players of all levels and ability and has established itself as a central and vital part of the local community offering a peaceful, social and recreational experience. Stone Creek Golf Club is committed to further improve the environment through education and stewardship action. Staff, guests, and the public as well as the environment will benefit from such actions.

To achieve this we will:-

- Identify and manage environmental aspects within our operations and apply best practice principles to ensure pollution prevention and the conservation of natural resources;
- Constantly strive to achieve continual improvement in our environmental performance by making business decisions that work towards sustainable outcomes;
- Meet and, where appropriate, exceed the requirements of all relevant legislation, regulations and other requirements to which we subscribe;
- Utilize an environmental management system framework to plan, document, measure and monitor environmental performance including setting and assessing environmental objectives and targets and conducting periodic reviews to report on progress;
- Continue to recognize the environmental, recreational, educational and social significance of golf;
- Openly communicate this policy to all employees, contractors, regulators and other stakeholders and make this policy available to the general public and local community;
- Foster an environmentally responsible attitude within our organization by providing appropriate training and competent assessments
- Ensure all those who work for or on behalf of Stone Creek Golf Club aspire to our expected standards of environmental performance and behavior.





## STONE CREEK GOLF CLUB

### ENVIRONMENTAL OBJECTIVES AND TARGETS REGISTER

ENVIRONMENTAL OBJECTIVES AND TARGETS REGISTER		
ASPECT	OBJECTIVE	TARGET
Environmental Induction of Staff	To ensure staff are aware of club's commitment to the environment and their individual environmental responsibilities.	Review staff Position Descriptions to include environmental responsibility.  Develop and issue an Environmental Induction Handbook to all staff by _____.
Reporting of Environmental Incidents	To ensure all environmental incidents are reported and appropriate corrective actions documented.	Develop SOP for incident reporting and incident report form by _____.
Management of Hazardous Material Spills	To prevent environmental harm as a result of a spill event.	Develop and implement SOP for spill response by _____.
Operational Controls SOPs	Operational control procedures (SOPs) for activities that cause or have the potential to cause significant environmental impact will be developed. Ensure that standard operating procedures for significant activities are conducted under controlled conditions are implemented.	Train staff to ensure they understand all the clubs relevant SOPs. Training session to be conducted by _____.
Reporting of Weekly and Monthly Environmental Performance	To monitor and document environmental performance on a weekly and monthly basis.	To commence a Weekly Environmental Reporting Checklist by _____.  To commence a Monthly Environmental Summary Reporting System by _____.
Environmental Training	To train staff on potential environmental events.	Conduct 4 TEE simulated training for an environmental event and 1 simulated spill response drill by _____.

### Example #3: Mirimichi Golf Course – GEO Certified – Environmental Policy Statement



## Environmental Policy

The owners and staff at Mirimichi are committed to practicing and promoting all aspects of good environmental stewardship and sustainable resource management.

Implementation of Best Management Practices across the facility include

- Resource management practices that have the greatest positive impact on plant and wildlife species, water, and ecosystems
- Activities, practices, and land uses that protect and enhance biodiversity
- Prevention of environmental problems through proactive day-to-day practices
- Environmentally sensitive control of potential problems
- Restoration, protection and enhancement of natural habitats
- Practices that conserve water and protect or enhance water quality
- Thorough environmental stewardship training for all employees and community outreach that focuses on environmental responsibility
- Commitment to account for our operational footprint for the goals of increasing efficiency and reducing energy and resource use
- Compliance with all local and national rules and regulations

Improvements in our environmental performance are made through continual monitoring of soil, water, plants, wildlife and pests to evaluate the management program and adapt to more efficient and effective strategies. Additional improvements are made through identification of new methods, resources and technologies that enhance our current resource base in ways that will maximize positive impacts on the overall quality of life and the environment.

Everyone at Mirimichi embraces ecologically responsible methods and a philosophy to honor the land and the living ecosystem that we all share.

Rich Peterson, General Manager

**Example #4: Rockland Country Club – Policy Statement**

## **Rockland Country Club's**

### **ENVIRONMENTAL POLICY**

Rockland Country Club operates, manages and maintains an 18 hole championship golf course with a club house, Swimming pool, and tennis Courts for the enjoyment of its members and guests. We are Located in Sparkill, New York only seven miles Northeast of Manhattan. The course encompasses 150 acres of rolling hills, wood lands, natural areas and ponds. Our 18 hole championship golf course provides a challenge for players of all levels and ability. Rockland has established itself as a central and vital part of the local community offering both passive and active recreation. Rockland Country Club is committed to further improve the environment through educational and stewardship programs. Our Staff, members, guests, the public and the environment will benefit from such programs.

To achieve this we will:

- Identify and manage environmental aspects within our operations and apply best practice principles to ensure pollution prevention and the conservation of natural resources;
- Constantly strive to achieve continual improvement in our environmental performance by making business decisions that work towards sustainable outcomes;
- Meet and, where appropriate, exceed the requirements of all relevant legislation, regulations and other requirements to which we subscribe;
- Utilize the Audubon Cooperative Sanctuary program and the e-par environmental management system framework to plan, document, measure and monitor environmental performance including setting and assessing environmental objectives and targets and conducting periodic reviews to report on progress;
- Continue to recognize the environmental, recreational, educational and social significance of golf.
- Openly communicate this policy to all employees, contractors, regulators and other stakeholders and make this policy available to the general public and local community;
- Foster an environmentally responsible attitude within our organization by providing appropriate training and competent assessments
- Ensure all those who work for or on behalf of Rockland Country Club aspire to our expected standards of environmental performance and behavior.

## Example #5: Alpine Country Club – Policy Statement

### **Environmental Policy: Mission Statement**

A commitment to strengthening the compatibility of the game of golf with the natural environment.

#### *EIFG Mission Statement*

- To provide a good environment for recreation.
- To coexist and provide a habitat for nature.
- To responsibly manage water, energy, and wastes to prevent waste and pollution.

### **Environmental Policy:**

- Efficient water usage on golf course
  - a. VFD installed in pump house
  - b. Computerized irrigation control
  - c. Use of soil moisture meter to determine physical irrigation needs
  - d. Wetting agent technology
  - e. Buffer zones around bodies of water
  - f. Raised mowing heights in fairways and rough
  - g. Use of low flow heads in landscape
- Integrated Plant Management
  - a. Scouting for pests
  - b. Use of composts and natural fertilizer sources
  - c. Reduction of salt based fertilizers
  - d. Reduction in pesticide usage
  - e. Cultural practices
    1. Mowing height adjustments
    2. Water management
  - f. Use of native perennial plantings requiring less inputs
  - g. Use of composted mulch to feed landscape
- 3. Wildlife and Habitat Management
  - a. Last of green belt areas
  - b. Perennials draw in pollinators
  - c. Perimeters allowed to naturalize, use of native vegetation
  - d. Buffer areas around ponds
- 4. Energy and Waste Management
  - a. Energy audit on property, changes in lighting clubhouse and shop
  - b. Installation of VFD controls for irrigation pumps
  - c. Composting of grass clippings and leaves, brush shredded for mulch
  - d. Pesticide tank rinsate used on course
  - e. Motor oil recycled to waste furnace



## HERITAGE HILLS GOLF COURSE

### ENVIRONMENTAL POLICY

Heritage Hills Golf Course operates, manages and maintains an 18 hole championship golf course and club house facility for the enjoyment of its members and guests. Located in southwest Nebraska, Heritage Hills offers a golfing experience that replicates layouts from golf's European origins. Untamed, wild prairie grasses occupy much of the 192 acre property. Yucca, wildflowers and other diverse flora complement a visual splendor that partners with a challenging layout to provide a "true" test of golf. Heritage Hills has established itself as a central and vital part of the McCook community offering a peaceful, social and recreational experience. **Heritage Hills is committed to further improve the environment through education and stewardship action. Staff, members, guests, the public and the environment will benefit from such actions.**

To achieve this we will:

- Identify and manage environmental aspects within our operations and apply best practice principles to ensure pollution prevention and the conservation of natural resources;
- Constantly strive to achieve continual improvement in our environmental performance by making business decisions that work towards sustainable outcomes;
- Meet and, where appropriate, exceed the requirements of all relevant legislation, regulations and other requirements to which we subscribe;
- Utilize the e-par environmental management system framework to plan, document, measure and monitor environmental performance including setting and assessing environmental objectives and targets and conducting periodic reviews to report on progress;
- Continue to recognize the environmental, recreational, educational and social significance of golf;
- Openly communicate this policy to all employees, contractors, regulators and other stakeholders and make this policy available to the general public and local community;
- Foster an environmentally responsible attitude within our organization by providing appropriate training and competent assessments;
- Ensure all those who work for or on behalf of Heritage Hills Golf Course aspire to our expected standards of environmental performance and behavior.



## HERITAGE HILLS GOLF COURSE

### ENVIRONMENTAL OBJECTIVES AND TARGETS REGISTER

ENVIRONMENTAL OBJECTIVES AND TARGETS REGISTER		
ASPECT	OBJECTIVE	TARGET
Environmental Induction of Staff	To ensure staff are aware of club's commitment to the environment and their individual environmental responsibilities.	Review staff Position Descriptions to include environmental responsibility.  Develop and issue an Environmental Induction Handbook to all staff by <u>10/1/11</u> .
Reporting of Environmental Incidents	To ensure all environmental incidents are reported and appropriate corrective actions documented.	Develop SOP for incident reporting and incident report form by <u>7/1/11</u> .
Management of Hazardous Material Spills	To prevent environmental harm as a result of a spill event.	Develop and implement SOP for spill response by <u>7/1/11</u> .
Operational Controls SOPs	Operational control procedures (SOPs) for activities that cause or have the potential to cause significant environmental impact will be developed. Ensure that standard operating procedures for significant activities are conducted under controlled conditions are implemented.	Train staff to ensure they understand all the clubs relevant SOPs. Training session to be conducted by <u>7/1/11</u> .
Reporting of Monthly and Annual Environmental Performance	To monitor and document environmental performance on a monthly and annual basis.	To commence a Monthly Environmental Reporting Checklist by <u>7/1/11</u> .  To commence an Annual Environmental Summary Reporting System by <u>1/1/12</u> .
Environmental Training	To train staff on potential environmental events.	Conduct 4 TEE or similar environmental training event and 1 simulated spill response drill by 1/1/12.
Water Conservation	Set a goal of 10% water usage reduction – dependent on weather patterns.	Become more efficient is water usage dependent on weather patterns by <u>1/1/12</u>

ENVIRONMENTAL OBJECTIVES AND TARGETS REGISTER		
ASPECT	OBJECTIVE	TARGET
Energy Conservation	Set a goal of 10% energy use reduction – dependent on weather patterns.	Become more efficient in energy use dependent on weather patterns by <u>1/1/12</u>
Bring Fuel Storage Area up to Acceptable Standards	To secure and provide containment measures in storage area.	To provide an adequate fuel storage area by 1/1/12
Delivery and Storage of Fertilizers and Pesticides	To review the current storage area and make the necessary changes and SOP to ensure proper and safe storage.	To develop a SOP for delivery and safe storage of fertilizers and pesticides by <u>7/1/11</u>
Waste Management	To reduce waste going to the landfill and provide a secure and specifically designated storage area for recyclable waste products.	To develop and specifically labeled area for waste and other recyclables by <u>1/1/12</u>

ISSUE DATE	DEVELOPED BY (Name)	APPROVED BY (Name)	PROPOSED REVISION DATE
10/16/10	William K. Bieck, CGCS	William K. Bieck, CGCS	7/1/11

# ***Environmental Charter*** **for** **Spruce Peak at Stowe**

"Great things are done when men and mountains meet."  
**William Blake**

## **INTRODUCTION**

To the many people who love Stowe, the natural environment of Mt. Mansfield, Spruce Peak and the surrounding area is precious. This is a refreshing, clean, beautiful place and we want to keep it that way. Please join me in celebrating – and protecting – the tremendous natural bounty of this landscape.

## **FOREWARD**

When *Spruce Peak at Stowe* was just a glimmer in this community's collective eye, preservation of the environment was a primary consideration. An award-winning collaborative planning effort then established a strong and clear future vision for the resort. This plan, based on the concepts of sustainability and environmental stewardship, has been endorsed by Vermont's environmental organizations, local and state government and the business community. The heart of this plan is focused on *Spruce Peak at Stowe*, a residential and commercial alpine recreation community located at the base of Spruce Peak. This charter establishes the principles and guidelines that are the foundation for environmental stewardship at *Spruce Peak at Stowe*.

## **MISSION STATEMENT**

*Spruce Peak at Stowe* will be a leader in environmental responsibility through the creation of a sustainable community that is respectful of existing natural resources and protects the future of the Stowe environment. "Green development" construction and design techniques will be used to enhance the quality of life, to maximize energy efficiency and to connect people to the natural environment and their community.



# PRINCIPLES

## 1. Collaborative Planning

The vision of Spruce Peak at Stowe belongs to no one person. It is the collective dream of many thoughtful people, each deserving to be heard. The concerns, ideas and inspirations of all stakeholders will continue to be actively considered. Positive working partnerships with environmental groups, state and local government and the business community will continue to be cultivated. As Spruce Peak at Stowe moves through construction and beyond completion, healthy partnerships between customers, investors, managers and employees will be a model for future collaborations.

## 2. Water Conservation

Water is a precious resource that will not be wasted. For example:

- Water use will be conserved through the installation of water efficient fixtures in all buildings.
- Native plant species requiring limited irrigation will be used for all landscaping.
- The Spruce Peak Golf Course irrigation system will make maximum use of recycled storm water for irrigation.

## 3. Energy Conservation and Green Building Design

With every building, a “tread lightly upon the earth” approach will be taken. For example:

- All lighting, heating, ventilation and air conditioning systems are designed to achieve maximum energy efficiency.
- Energy systems have been engineered in coordination with Efficiency Vermont, an innovative Vermont program created to insure energy efficient development.
- EPA Energy Star Guidelines will be used for all construction and, in certain cases, certification under the national green building program; LEED (Leadership in Energy and Environmental Design) will be obtained.

## 4. Chemical Use Management

No doubt about it: golf courses are beautiful places. The Spruce Peak at Stowe vision is to achieve that beauty with natural materials. The altitude of this site, combined with sophisticated drainage systems and disease resistant grass types,

will help achieve that goal. The Spruce Peak Golf Course Management Plan has been prepared with the assistance of environmental organizations and will significantly limit the use of pesticides or herbicides. It is our objective to create the most environmentally sensitive golf course within Vermont.

## 5. Waste Management

The principles of “Reduce / Reuse / Recycle” must be embraced in order to manage society’s growing landfill needs. *Spruce Peak at Stowe* will minimize waste production through the use of convenient recycling opportunities, in turn minimizing its contribution to growing landfills. All new construction will be managed under a Solid Waste Management Plan, prepared in coordination with both the State and the County Solid Waste Authority, that requires recycling of both construction and demolition material.

## 6. Transportation

Public transportation is an important tool for improving air quality and decreasing dependence on petroleum fuels. It helps maintain a level of traffic consistent with the expectations that people have for rural Vermont. *Spruce Peak at Stowe* is served by the Stowe Trolley system, allowing residents and visitors to leave their cars parked while staying at the resort and still visit Stowe Village and the Mountain Road for shopping or dinner.

*Spruce Peak at Stowe* is designed to encourage pedestrian access; a parking garage and underground parking will house cars. Pedestrian paths will connect all activities and a heated plaza and walkways will serve the core area. A transfer lift will connect the Spruce and Mansfield base areas. Convenience and environmental protection go together nicely.

## 7. Stormwater Management

The protection of streams and wetlands has been incorporated into all facets of the *Spruce Peak at Stowe* design. For instance:

- Sidewalks will be heated to eliminate snow and ice without the use of salt and gravel.
- Two new snowmaking ponds will allow the resort to take less water from the river at critical times, increasing stream flows during the winter snowmaking season.
- Innovative stormwater collection systems have been engineered throughout *Spruce Peak at Stowe* and a comprehensive Water Quality Management Plan will guide all future activities at both Stowe Mountain Resort and *Spruce Peak at Stowe*.

- A strict erosion and sediment control plan has been implemented for all phases of construction, and significant wetland areas have been preserved and protected.
- Native grasses and grassy swales will be utilized to filter stormwater before it is discharged through a large settling pond that will also store snowmaking water.

## 8. Environmental Education

Can we go beyond responsible stewardship of the environment? Absolutely! Visitors to *Spruce Peak at Stowe* will have abundant opportunities to learn and be inspired by nature.

- In cooperation with the University of Vermont and other environmental organizations, we will pursue the establishment of an environmental education center to promote research and educational opportunities.
- We will continue to coordinate with the Smugglers Notch Scenic Highway Partners to protect and preserve the Smugglers Notch Scenic Corridor, one of only two federally designated scenic highways in Vermont.
- Continued participation in Mt. Mansfield Summit Management Partnership will ensure the future quality and management of the mountain's backcountry and summit hiking system.

## 9. Natural Habitat

Spruce Peak at Stowe embraces the principles of compact, clustered development; land management that deters non-native plant species, and protection of habitat for rare animals.

- Over 2,000 acres surrounding *Spruce Peak at Stowe* has been permanently protected through either state ownership or the use of conservation easements.
- Only naturalized native vegetation will be used for all landscaping and, whenever possible, existing mature vegetation will be maintained throughout the project site.
- The summit of Spruce Peak will be allowed to naturally re-vegetate after the Big Spruce lift's top terminal has been relocated. This will increase habitat of the Bicknell's Thrush, an important high altitude bird species.

## 10. Landscape Aesthetics

Thoughtful development should consider whether man-made structures are in conflict or harmony with their surroundings. *Spruce Peak at Stowe's* clustered design employs state-of-the-art community planning principles combined with rustic mountain architecture that compliments the historic and natural elements of the site. Local business participation in future retail development will be encouraged. *Spruce Peak at Stowe* has been derived from the context of its surrounding setting. The dramatic terrain and spectacular natural setting will be reflected in the architecture. The natural use of materials and forms will allow the blending of man-made structures into nature. This style will convey the luxury of the resort within both the history and natural environment of Mt. Mansfield and Spruce Peak.

"Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you... while cares will drop off like autumn leaves."

**John Muir**