

Phipps' major cost is the equipment needed to perform the task effectively and efficiently.

"Cost hasn't been a challenge to this point because we're making enough money to cover an additional expenditure needed to care for the greens," he says. "The one thing we do battle is labor and time. As a public course, Stone Creek generates about 60,000 rounds annually, so finding the time to cultivate the greens can be a challenge. We have to be creative when working our cultural practices without affecting tee times."

Labor and time are verticutting issues, but when it comes down to it, superintendents must view the process as an investment in the quality of the course, Williams says.

"We spend about \$5,500 a year in parts and labor associated with our verticutting programs," he says. "That doesn't include the initial cost of the mower and verticut reels. If it costs \$10,000 a year to do your verticut program, you must decide whether this is a plus or minus."

Superintendents also should consider factors such as the total grounds budget, golfer expectations, turf type and local stresses when they weigh the value of their program.

"Our program is worth the investment we make," Williams says.

To verticut greens, a superintendent will need a set of verticut heads for a triplex mower (between \$3,000 and \$4,000) and a fairway unit that can range in cost between \$5,000 and \$25,000, depending on the size and type of machine.

PROGRAMS

There are a few ways superintendents can implement a verticutting program, Haines says.

"One option is not owning fairway equipment and having contractors come in with their own machines," he says. "It's quick, and you don't pay for a machine that you use minimally. It costs about \$250 to \$300 an acre to have a contractor come in, and they'll vacuum the debris as well. You have to balance owning your own equipment versus having someone do it for you."

At Stone Mountain Golf Club, Anthony Williams, CGCS, verticuts some parts of the course every 10 days and other parts two or three times a year. Photo: Stone Mountain Golf Club

Verticutting benefits

- It improves turfgrass quality through thatch removal.
- When combined with topdressing, it improves water penetration and air flow into the soil.
- It has little impact on daily playing conditions because turfgrass recovers quickly from the process.
- It produces more upright grass growth for better mowing conditions.
- Turf that's verticut might withstand the threat of disease and harsh weather conditions to a greater degree because of growth stimulation.

And being creative with the staff can help lower the cost of verticutting.

"I don't see the extra man-hours as prohibitive," Barrington says. "Instead of doing fairways one day, grab those guys and have them verticut, especially on days when you don't have a ton of play."

There seems to be little research to suggest a direct correlation between verticutting and disease prevention. But maintaining healthier turf can never hurt.

"Any time a cultural practice can be performed to encourage plant health, your benefit will automatically be disease prevention," Phipps says. "A successful verticutting program

will coincide with a proven fertility program. One can't work independently of the other."

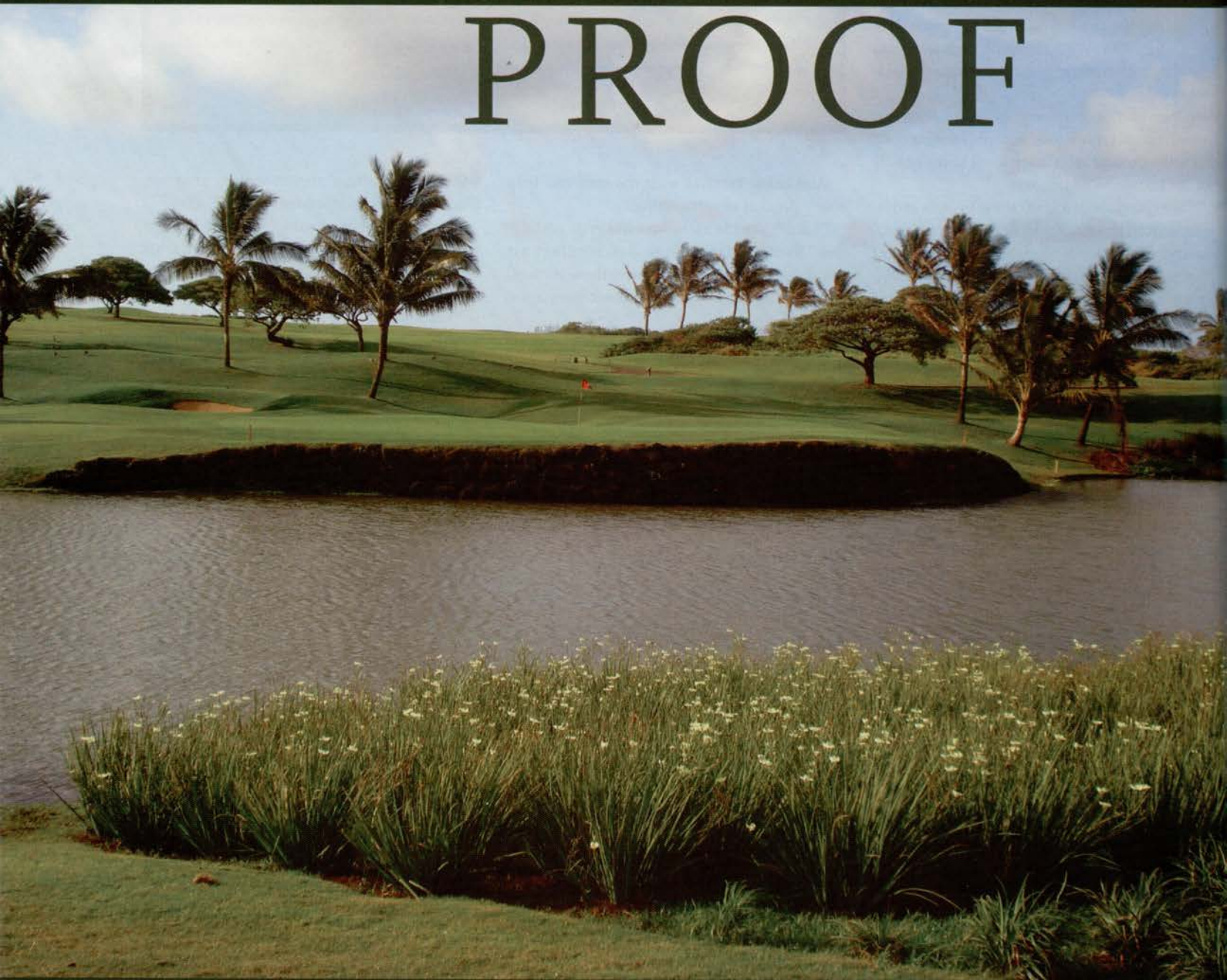
Superintendents should avoid turf damage when verticutting, especially on crowned areas of greens that can be damaged easily by blades or dry out quickly after the process.

"Verticutting can cause mechanical injury to the turfgrass plant, and that can stimulate disease if done at the wrong time of the year," O'Brien says. **GCI**

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WRITTEN PROOF



Quality maintenance is a function of a superintendent's experience, knowledge and available funds. Photo: Bill Bushman

by WILLIAM BUSHMAN

Here are five steps to manage your environmental stewardship

Mention the phrase “golf and the environment” to so-called environmentalists, and their expression immediately changes as they prepare to deliver a well-rehearsed and passionate diatribe about how golf uses phenomenal quantities of “methyl-ethyl-death” pesticides, groundwater-polluting fertilizers, and valuable drinking water to maintain exotic turfgrasses for the entertainment of the rich and famous. Mentioning the same phrase to a golf course superintendent elicits a variety of responses ranging from “we don’t have any environmental issues” to “we’re pursuing certification,” as they smile and slowly ease away.

More often, I run into an educated and sincerely interested member of the golf course industry who realizes golf and the environment are one and the same – and they want to make a difference.

In reality, I believe a large majority of superintendents are compliant environmentally day in and day out. Also, I believe many of them are conscientious environmental stewards who, unfortunately, spend little to no time documenting their management practices. In short, they’re good stewards who fail to provide written proof of their stewardship. It’s understandable, to a degree. I mean, who relishes the idea of volun-

tarily adding another major task to their regular daily responsibilities and duties?

So far, in most places, an environmental management plan isn’t required of most golf courses. But there appears to be an increasing consensus among members of the golf course industry who believe the topic of golf and the environment – and dealing with environmental management planning regularly – is here to stay. Accordingly, managers of the game of golf must respond aggressively to critics who don’t believe golf and the environment are compatible or golf courses aren’t a positive contribution to their communities.

Well-informed golf course superintendents and managers are the key to this aggressive approach. Documented environmental stewardship is the only way to convince the opponents of the game to understand good golf course management is inherently compliant and environmentally sound. The key is in the proof, or in this case, the written, implemented and regularly updated golf course environmental management plan.

Because the average day of a golf course superintendent already involves time and effort spent dealing with labor, management, weather, tournaments, membership, vendors, budget, equipment, licensing, irrigation, training, language barriers and community concerns, how do the environmentally-conscious document their compliance while managing the significant issues at their course? One way to accomplish this is following the GEM planning process.

GEM PLANNING PROCESS

The five-step comprehensive golf course

environmental management or GEM planning process is based on ISO (International Organization for Standardization) 14001, an international standard for environmental management systems based on sound planning, demonstrated stewardship, and continual improvement. Properly employed, the GEM process will yield measurable, continual improvement that focuses on the significant issues faced by the superintendent or manager at their golf course.

STEP 1: ANALYSIS

Experienced golf course architects know data collection, site analysis and keen observation are the keys to a good design. The same is true for environmental managers. Collecting and analyzing pertinent data; determining inherent opportunities and constraints of the land, its setting, its environmental challenges, and its management; as well as examining the course firsthand are all key tasks that need to be performed. All aspects of the golf course facility should be part of the analysis step. Those areas include the:

- Maintenance complex;
- Golf car storage building;
- Pesticide mixing and storage area;
- Equipment fueling and wash area;
- Clubhouse;
- Restaurant or snack bar; and
- Pro shop.

Another important component of the analysis step of the GEM process is the five-category, 100-question environmental compatibility index checklist. The ECI checklist categories include planning and compliance, operations and maintenance, water resource

management, conservation, and pesticides and pollution prevention. The ECI checklists are used to determine the current compatibility of a course's management practices with general environmental stewardship goals and objectives and will provide the manager with two measures. The first is the actual ECI – the tally of the “yes” answers provided in the checklist. This score represents where the course's stewardship level is today. The second measure, or the potential ECI, tallies the “yes” and the “partial” answers and shows where the course's stewardship level could be with a little more effort.

Additionally, any available environmental studies, maps, future development plans, and state/local regulations and requirements are collected to determine the potential environmental challenges, if any.

STEP 2: DOCUMENTATION

Having completed the detailed analysis, collected all the important data and established the baseline, the next step is to complete the assessment by identifying a course's environmental challenges and to finish the GEM plan document. Environmental challenges can be defined as concerns or issues of local, state, regional or national significance that might be impacted by

a golf course's management practices. A simpler definition for a challenge is any environmental issue that is bigger than the golf course. This is where the rubber meets the road. Determining a course's potential environmental challenges might or might not be a complex task. It depends on how well you know your community, state and federal regulations. A consultant might be valuable at this stage to ensure your list of challenges.

The list of potential environmental challenges parallels the gamut of environmental laws and regulations and includes:

- Wetlands;
- Landfills;
- Water conservation requirements;
- Threatened or endangered species habitat;
- Groundwater, wellhead, and injection well protection;
- Pesticide usage restrictions;
- Permitting;
- Storm water quality;
- Environmental restoration sites;
- Water supply;
- Archaeological and cultural resources;
- Floodplains;
- Air quality; and
- Coastal zone management.

Armed with the final list of environmental challenges, the golf course superintendent can begin the important task of determining the management practices for each to ensure short- and long-term compliance with appropriate regulations or concerns. Accordingly, when this information is overlaid with the course's maintenance activities, sensitive environmental challenges can be protected by the management staff more readily. This is accomplished by examining all of the course's management practices that possibly could impact an identified environmental challenge negatively. By identifying practices that can have a profound or significant effect on management's perceived ability to be stewards of the environment, more emphasis can be placed on employees to take special care during these tasks.

Additionally, for each environmental challenge, a superintendent must determine an appropriate management practice that complies with all regulatory requirements while ensuring the golf course is still attractive and playable for customers.

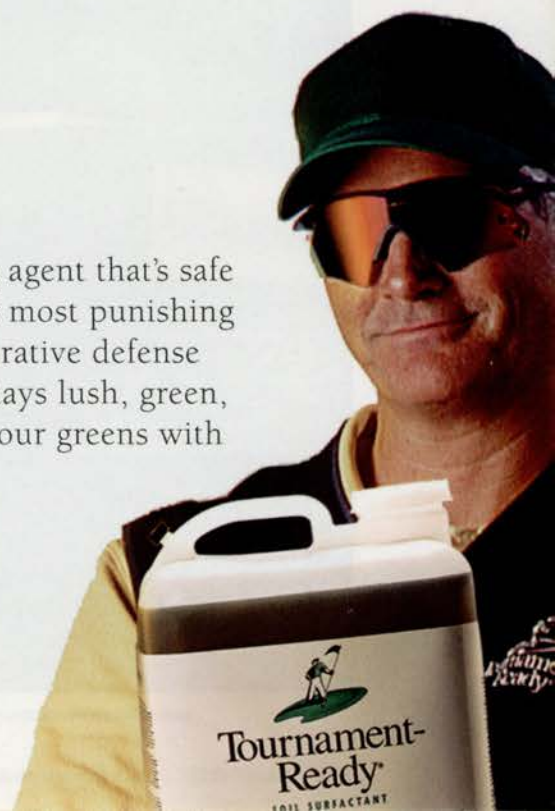
Courses implementing a GEM plan must have a written environmental policy that includes statements such as minimizing the potential for negative impacts, always staying compliant

Pond maintenance can be a complex task when you're unsure of applicable environmental regulations. Photo: Bill Bushman






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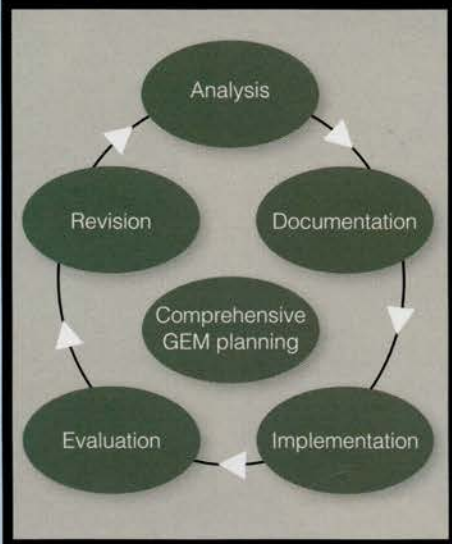
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GEM process



and committing to regular reevaluation to satisfy the policy requirements. Because all employees should be aware of the policy, a mention in a newcomer's brief and a regular mention of the policy and its implications during weekly staff meetings or safety briefings are good ways to get the word out to employees. And because you've come this far, why not post it for employees and customers? Take credit when you can. A professional-looking policy statement can be created and posted easily in highly visible locations throughout the facility.

STEP 3: IMPLEMENTATION

Positive, decisive action is the only true measure of a GEM plan's success. By implementing new practices, whether to knowingly improve the course's environmental compatibility or to just try new ideas to determine their value, you and your customers should benefit. Consider providing summaries of the GEM plan and posting

a map of the property depicting its particular environmental challenges for customers and employees and immediately begin finding ways to minimize or eliminate any and all potentially negative environmental impacts.

STEP 4: EVALUATION

Continual improvement requires regular evaluation. Ongoing measurement of the reduction or elimination of environmental impacts the newly implemented practices have on the course is one way to evaluate a course's management practices. For example, documenting the reduced use of inputs such as fertilizers, pesticides and irrigation can be used to demonstrate the increased environmental stewardship of the golf course management practices, as well as the overall value of the GEM plan. It's important all golf courses show improvement in their environmental compatibility throughout time. One way this can be accomplished easily is to evaluate golf course

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management practices regularly and change, refine or adjust them where appropriate.

STEP 5: REVISION

A high-quality GEM plan must reflect the most current situation to be valid. Acting on lessons learned is right behind initial implementation as the most important aspect of a successful golf course operation. Accordingly, a GEM plan should be kept as current as possible at all times, with major revisions regularly scheduled at appropriate intervals. And once completed, a GEM plan is easy to update because most of the work has been done already.

A GEM planning process can guide the comprehensive management of all aspects of the golf course facility while establishing a measurable baseline to track improvement. The GEM planning process also ensures management efforts are focused on the significant concerns by environmental challenges. Additionally, a GEM

plan assists with attaining and maintaining daily compliance with all appropriate rules and regulations while ensuring constant examination of all aspects of golf course management to achieve the highest standards of environmental excellence. Done correctly, it will be worth the effort and will provide you with proof of your stewardship to all those environmental activists who know so much about your business.

So, the next time an environmental activist – or a customer – asks you about golf and the environment, you can be ready with a well-researched, field-tested, regularly updated written answer that stops them in their well-worn tracks ... with the truth. **GCI**

William Bushman is the director of Ecodesigns, a San Antonio-based golf course environmental consultant company. He can be reached at ecodesigns@sbcglobal.net.



Sedimentation of ponds connected to a running stream is a common golf course environmental challenge. Photo: Bill Bushman

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Building a facility to contain chemical and fertilizer products completely makes sense to Paul Miller, CGCS. He says he needs to be able to handle, load and mix products and wash equipment in a controlled environment. Photo: David Wolff



Stepping UP

NASHAWTUC COUNTRY CLUB TAKES PROTECTING

THE ENVIRONMENT TO THE NEXT LEVEL *By David Wolff*

There's been a lot of talk lately about reducing the nation's impact on the environment. And while some people make decisions to reduce their "carbon footprint" and use less energy, among other environmental practices, golf courses are improving their own environmental stewardship. Nashawtuc Country Club in Concord, Mass., is an example.

First, the club was honored by Audubon International as a Certified Audubon Cooperative Sanctuary, and secondly, it opened an environmental management center.

The course is the 10th in Massachusetts and 638th worldwide to earn recognition through the Audubon Cooperative Sanctuary Program for golf courses, a program recognized and supported by the USGA, the PGA of America and other golf organizations that help protect the environment and preserve the natural heritage of the game of golf.

The 220-acre Nashawtuc Country Club, which is adjacent to the country's oldest Audubon Society chapter, and Paul Miller, CGCS, have taken a systematic approach to address environmental issues, says Kevin A. Fletcher, Ph.D., executive director of Audubon International.

"They've gone above and beyond what's required by law to protect the environment," Fletcher says. "The new facility is part of a culture at the club to work toward a positive impact on the environment."

The impetus for the environment management center, which is adjacent to the maintenance facility, came when Miller took a close look at the 100-year-old maintenance building, which was an open-air, wooden structure located directly above a wetland. He proposed

an improvement project to the club's board of directors in February 2006. Additionally, club management decided it wanted to complete its Audubon International certification.

"Many clubs wash equipment in a place where water will drain into a low area," Miller says. "There are clippings treated with chemicals and fertilizer that are draining into areas that should be regulated. Massachusetts has no regulations on wash water, or rinsate, so, in essence, we were polluting. To coin a phrase I'm fond of, 'the past belongs to the future.' What we're doing now will influence future generations. Building a facility with full containment of chemical and fertilizer products makes sense. We have to be able to handle, load and mix products and wash equipment in a controlled environment."

EMC FEATURES

Miller chose an ESD closed-loop wash system for the environment management center. Because the system is self contained, there are no leaching or rinsate issues. The system controls everything that comes off equipment – grease, oil, grass, pesticides and fertilizer. The liquid is broken down by enzymes, while the clippings are filtered out and hauled to a mulch pile. Bioremediation is used to reclaim, treat and recycle the water.

The center includes a chemical storage room with a pitched floor and sump to recover anything that's spilled. Adjacent to the chemical storage room is a mix-and-load bay – also with a pitched floor and sump – for sprayers. There are a series of valves in the mix-and-load bay, so if there's a major rupture in a tank or line, all the chemicals can be recovered and stored in a

300-gallon tank. When checking nozzles and pressures, the valves ensure any rinsate flows into the ESD system in the next room.

The environmental management center, which is located in a high-and-dry area, is contoured away from the building so nothing can drain inside. A series of catch basins ties into a vortex chamber that ties into a headwall that disperses into the wetlands. The basins filter sediment to prevent material from draining into the wetlands. The basins and vortex are cleaned several times a year.

"We were on the front end of any environmental issues, and the town of Concord embraced the project," Miller says. "For Audubon certification, the assistant natural resources commissioner was part of the club's support group."

The building permit for the project needed 12 stamps of approval from various government agencies before construction could begin. The club selected Golf Structure Alternatives from Rye, N.H., to coordinate government agency approval and design the 115-foot-by-33-foot facility.

"The goal was to address environmental issues involved with the handling of chemicals and washing equipment," says Roger Mulloy president of Golf Structure Alternatives. "Golf needs to be at the forefront of environmental sensitivity. In the past, the industry hasn't been as proactive as it needed to be. Our company works with clubs to help them accomplish these goals."

While a project like this isn't inexpensive, there are cost savings for the club.

"For us to get a good price on quality products, we have to take advantage of preseason buying to

maximize discounts; and to accomplish that, we need appropriate storage,” Miller says.

Choosing an accomplished architect such as Mulloy reaped other benefits.

“The tighter the specifications on the building, the more competitive the bidding,” Miller says. “The building is fireproof and has cinder-block construction, contoured floors and a metal

roof. The cost was \$150 a square foot, or about \$600,000. That might seem expensive, but in relationship to the cost of an environmental cleanup, it’s not a lot of money.”

ENVIRONMENTALLY SENSITIVE PROGRAMS

The new facility hasn’t changed Miller’s cultural practices because he’s always tried to do what’s

best for the environment.

“Some of the products we use are expensive, but they pay off in other ways,” Miller says. “For example, we’re going to use a new product, Trinity, from BASF to control anthracnose. By research standards, it will give us 28-day control. As a result, we will be using two-thirds less product to control this disease.

“Almost all golf courses use plant protectants, and we want to be in line with organizations like Audubon and use the latest technology and a minimum amount of product to get acceptable results,” he adds. “If I’m chasing a fungus rather than being proactive, I’m using 66 percent more product. I’m exposing more people and turf to more chemicals. As long as Audubon keeps that big-picture perspective and knows we’re responsible users, we can work together. That’s incredibly exciting.”

Miller says many clubs don’t pursue Audubon certification because of the requirements for storage, mixing and loading of products, as well as taking care of rinsate. However, Audubon doesn’t require a facility like the one at Nashawtuc.

“We’re all responsible enough to try to keep up with technology, but if my chemical budget is X,



Nashawtuc’s environment management center features an ESD closed-loop wash system. Because the system is self contained, there are no leaching or rinsate issues. Photos: David Wolff

