

Briefs



**EPA FUNDING RESEARCH**

The Environmental Protection Agency will give \$1 million a year for 10 years to each of four universities chosen as EPA Exploratory Environmental Research Centers.

Of those chosen, the University of Maryland System at Horn Point was chosen to do multi-scale coastal marine ecosystem research, while the University of California at Davis was picked to study ecotoxicology.

The centers are being established to provide research directly related to the EPA's long-range research strategy.

An independent scientific peer review panel and site review teams recommended the grant recipients from among 87 that applied.

Along with Maryland and California universities, the Massachusetts Institute of Technology and consortium members Caltech and New Jersey Institute of Technology will study transformation, transport and control of airborne organics; and Michigan Technical University, with consortium members Wisconsin and Minnesota, will study clean manufacturing technologies.

**WEST VIRGINIA ELECTS LEADERS**

The West Virginia Golf Course Superintendents Association has elected officers for 1992.

President Charles A. Murray of Edgewood Country Club succeeds Past President John C. Cummings of Berry Hills Country Club.

Vice president is Arthur R. Casto of Kanawha Country Parks, while Patrick E. Lewis of Scarlet Oaks Country Club is secretary-treasurer.

Serving on the board of directors are Howard H. Lott of Bridgeport Country Club; Carl Buttrey of St. Marys Golf Club; Gary Roush of Riverside Golf Club; David A. Tennant of Lakeview Resort (North Course); Dr. John F. Banieki of WVU Extension Service; and Richard A. Piatnek of Tri-Star Soils, Inc.

The officers and directors will guide the association in 1992 through its regular monthly educational meetings, annual scholarship and research fund-raiser golf tournament in June, and annual turf conference and show in November.

**40 YEARS IN FLORIDA**

The Florida Turfgrass Association will celebrate its 40th year at its annual conference and trade show, Sept. 20-23 at the Prime F. Osborn Convention Center in Jacksonville.

This year's conference will feature an educational program led by national experts in turf and related fields.

The event draws more than 2,000 visitors. More information is available from the Florida Turfgrass Association and Research Foundation at 800-882-6712.

**RESEARCH SUPPORTED**

The New Hampshire GCSA said it will continue its support for one more year of two research studies — Stan Swier's study of using nematodes to control cut worms, and Dr. John Roberts' research on winter kill.

The chapter donated more than \$11,000 for research in 1991.

# Saluting solutions

## Gainey Ranch's effluent plant gets an 'A'...

By Lyn Tilton

When Gainey Ranch of Scottsdale, one of 93 golf courses in the Phoenix, Ariz. area, sought permission to build its 27-hole complex in the mid-1980s, the city fathers responded, "Sure, but if you want water you'll have to build an efficient treatment plant." So they did, then donated it to the city.

"The plant cost \$4 million," said George Corthouts, superintendent of the semi-private course. "Scottsdale owns and operates the plant, and delivers the water we need at 46 percent of the cost of potable water rates in this area." That currently translates to 62 cents per thousand gallons, compared with \$1.38 for other users.

The treated water flows at 15,000 gallons per minute over a massive waterfall on the 9th hole of the Lakes nine, then meanders through the rest of the lakes. At the lowest point on the complex, the water is drawn out for irrigation, or recycled through the waterfall. In this desert state, a waterfall is an added attraction for visitors, and helps Gainey Ranch



George Corthouts, rear, discusses water treatment with Jim Tombaugh, treatment plant manager, inside the plant.

achieve 320 rounds of golf daily in the winter months and an average of 100 golfers in the summer.

"Frankly," said Corthouts, a Connecticut native used to rain, "in this area if you don't have water you don't have a golf course."

When you use 2 million gallons per day, water costs naturally add to the cost of play, which at this semi-private course comes in three rates: \$55, \$86 and \$100, plus taxes. "We are a true semi-private course, with one-third of our tee times reserved for guests at the Hyatt," Corthouts said.

"There are a lot of golf courses in the area, but in the winter we're all booked." Even with 93 courses to choose from, a seven-day reservation is not unusual during the winter months. Summer play is less intense, but it still makes watering schedules a challenge.

Gainey Ranch uses 100 percent of the water treated by the plant, which is situated next door to the maintenance complex. "In the winter it could support four or five courses, but during the four months of summer we need all of the water," Corthouts said.

He noted that the local water

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## ...while Ocean Reef Club taps into the ocean for its H<sub>2</sub>O

By Kit Bradshaw

Superintendents throughout the country are using effluent from wastewater treatment plants to irrigate their courses.

But Ocean Reef Club in Key Largo, Fla., which is surrounded

by the sea, uses another method to capture this needed irrigation water. The club provides its irrigation water through its own desalination plant.

The reverse osmosis plant, which takes brackish water and

converts it to irrigation-quality water, has been operating for more than two decades. This desalination system provides the 36-hole golf course with 700,000 gallons of non-potable irrigation water a day. Potable water is

provided by the Florida Keys aqueduct which brings treated water from the Biscayne Aquifer.

The reason for the desalination is simple economics. Potable water from the aqueduct costs

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## Kozelnicky garners coveted Georgia honors

By Vern Putney

AUGUSTA, Ga. — Never, in his wildest dreams, did George M. Kozelnicky think he would be sharing golf's center stage with the "King of Golf," nor that he would be congratulated on his achievements by the legendary Arnold Palmer.

Twenty-four hours after being inducted in the Georgia Golf Hall of Fame for service to the game, it hit home. The impact was staggering.

"It's the biggest thing that ever happened to me," said the retired instructor of agronomy and plant pathology at the University of Georgia.

"That this honor occurred in front of 800 of the most renowned names in golf and among my friends," said Kozelnicky, "is overwhelming."

A self-described "avid hacker"



Arnold Palmer joins George Kozelnicky in his celebration.

Photo by Frank Christian

who took up golf at age 43, Kozelnicky is enshrined alongside distinguished competitive company. The Hall, launched in 1989, now has 29 members. All but "Old Koz" have sparkling playing credentials.

Yet Kozelnicky has earned equal stature for game contributions.

Kozelnicky took a circuitous route to the Golf Hall of Fame.

The 73-year-old Akron, Ohio, native as a teenager mowed bluegrass tees. After serving in World War II as an aerial gunner and later as instructor, he attended the University of Georgia, where he obtained both bachelor's and master's degrees in less than four years. He became a faculty member in 1951.

While pursuing a doctorate at Purdue University from 1958 to 1961, he discovered the specialized

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# Gainey Ranch's treatment plant solved water question

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table is about 330 feet down — when you can get a drilling permit. "We run two wells for potable water, and it's hard water," he added.

But tertiary-treated water seems to be gaining favor in the Valley of the Sun. In fact, Corthouts predicts that eventually all new golf courses in Arizona will keep green via treated effluent water. "Older courses in this area are grandfathered with well water or city water," he said.

When asked the biggest challenge in irrigating with treated effluent water, Corthouts replied: "Sodium. Not all nitrates or phosphates are removed, either, so when water gets to the lakes on the course, it tends to promote weed and algae growth. It's hard to leach sodium out of clay."

His solution is to apply sulfur semi-annually and gypsum annually. "We lay down 100 pounds of sulfur and 200 pounds of gypsum per acre in June, then add another 100 pounds of sulfur in August," he explained.

"We do a lot of aerifying. We have one large machine, which we run every day."

A positive result is the effluent water makes an attractive, even lush, course all the more possible. For Arizonans, golf courses have the largest open water display within two hours of town. Gainey Ranch has 18.3 acres under water in six lakes, with 11 acres holding only treated water. The rest get well water.

When spring temperatures of the ponds reach 90 degrees, algae bloom is a real challenge.

"We use ozone in our lakes, making it through an electrical arc. It gives us O<sub>3</sub>, but with a negative charge instead of a positive charge," Corthouts said.

He noted that Gainey Ranch was one of the first in the Southwest to



Tertiary-treated effluent water makes this waterfall possible, says course superintendent George Corthouts.

try the negative charge, but the concept is becoming popular.

"It's a water-treatment technique that leaves no residue," he said. "It has a half-life of just 20 minutes, then turns back into oxygen. The treatment saves us money in the long run."

He said ozone has cut annual chemical bills by \$50,000. "O<sub>3</sub> pays for itself in three years. It was easy to sell upper management on it," he added.

Because the lakes also are used for storage, Corthouts said, "We could go a week or two in the summer should the treatment plant have to shut down for repairs."

Watering is a daily summer chore, but in winter they have to keep the sprinklers going just two or three times a week.

With the treatment, there's little sludge to clog sprinklers. The water is crystal clear. Turbidity is very low.

"Water, itself, seldom is a problem in the sprinkler. The challenge is the algae," Corthouts said. He also noted the ponds tend to darken, and his crew has to take standard precautions when they draw from the ponds, just as do courses using ponds filled by other water sources.

Another cost-saving step is that the pond treatment system was designed to be 90-percent efficient at the worst time of year, rather than the more costly 100 percent. "That other 10 percent would cost us a fortune" Corthouts explained.

Jim Tombaugh, treatment plant operator, said turbidity is less than 1.0, versus drinking water standards of 0.4.

"There are still minerals and nutrients in the water that don't meet potable water requirements," he said.

Tombaugh said the treatment

system is limited to biological methods. "The only chemical we use is chlorine."

One advantage is that the plant, which maintains a low profile behind a wall on the edge of the complex, blends in with the course's overall design. It doesn't seem to be a sewage treatment plant.

Tombaugh said a 30-inch main comes into the plant. But, by the time the main joins its brothers and arrives at the regional treatment plant across the metro area and 40 miles away, the volume is 120 inches.

Tombaugh noted that the golf course helps keep the entire system less costly. Not only does Scottsdale profit by selling water to Gainey Ranch, but there's less volume to send to that regional plant.

Even with treated water, it's a

fight to have enough water and leave time for golfers. They can't sprinkle between foursomes, and with 320 per day, it's hard to shut down nine holes for watering. For that reason, the main waterings are from 9 p.m. to 6 a.m. Sprinkler checks and repairs are made between foursomes.

Making sure maintenance doesn't interfere with the game keeps Corthouts and his crew busy. But the real challenge is getting enough water on the course, even with daily waterings. "June and July are particularly challenging, but during August the rains catch us up. We get seven inches annually, with half that in our August 'monsoon' season," Corthouts said.

That also reduces need for the plant's water. Tombaugh added: "The plant's designed for extended aeration and year-round nutrient removal. We run three aeration basins in the winter and five in the summer. We also have sand filters, using 11-inch-thick sand beds, and we clean those beds several times a day."

This permits the operator to filter out colloidal mass. That mass goes back into the sewer system, and again is removed at the regional plant. They don't store or truck solids at Gainey Ranch. The goal is to keep the plant's profile low.

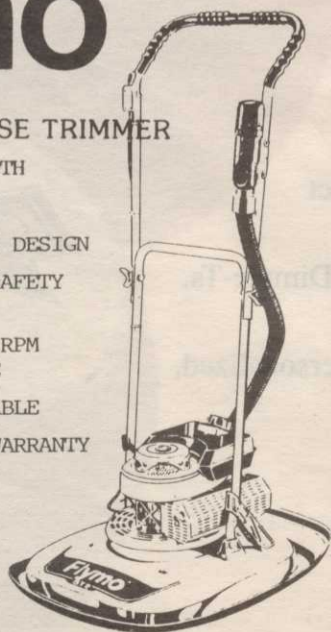
Essential to a successful on-site treatment plant is communication. "We're right next to each other," Corthouts said. "If either has a problem, the other knows about it immediately. If the plant has to shut down for repairs, for example, we can start drawing from our ponds. This plant can refill a pond in just eight hours."

Best of all, golfers are seldom aware that they're playing near a waterfall and on a green surface made possible by wastewater.

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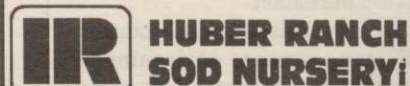
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# Desalination plant was the answer for Key West facility

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\$5.18 per thousand gallons for the first 12,000 gallons and then jumps to \$6.18 per thousand. The desalination plant can provide water for approximately \$3.00 per thousand gallons.

It's not cheap, compared to the rates in Boca Raton—\$0.85 per thousand gallons—but it certainly is more economical than irrigating with the potable water coming from the aqueduct.

For several years, Ray Hansen was the golf course superintendent at Ocean Reef Club. Today, Hansen is the superintendent at Delaire Country Club in Delray Beach.

"Straight salt water contains 35,000 parts per million of salt," Hansen says, "while the

brackish water that is desalinated is 3,500 parts per million. If you take this brackish water, and put it through a new, well-maintained reverse osmosis plant, it comes out at 350 parts per million. If you treat it according to health department requirements, it can be potable water.

However, this is the best-case scenario.

"As the plant gets older, the membranes within the reverse osmosis system have a tendency to clog up, and they need continual maintenance. Eventually, they become less and less effective and they have to be replaced."

Hansen says that five years ago, new equipment was installed in the desalination

plant at Ocean Reef Club. This \$700,000 project upgraded the equipment and the membranes within the plant. The membranes have a five-year lifespan, he says, and they should be replaced shortly. The remaining equipment will be functional for another five years.

Although the desalination plant provides the club with the much-needed irrigation water, some precautions are needed when using this type of water.

"As the membranes get older," Hansen says, "the salt content in the water slowly rises. The soil index must be constantly monitored. A salt ratio of 1,000 parts per million or less is acceptable for the

turfgrass. Anything above that can cause problems.

When this salt content reaches 1,000 parts per million, then the membranes in the reverse osmosis plant must be cleaned, or if they are older, replaced."

Hansen says that in the future, Ocean Reef Club may begin using effluent in combination with the desalinated water from the reverse osmosis plant.

This combination would reduce the cost of the irrigation water.

However, he adds, availability and cost will be the final determining factor in using a combination of desalinated water and effluent on the Ocean Reef Club courses.

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