

Don't Wait Until the Well Runs Dry

Changing water sources: from good to good.

BY TOM WERNER, CGCS

Even though the old adage goes, "If it ain't broke, don't fix it," sometimes we do not have a choice or must look for other options. This was the case at Shadow Hawk Golf Club and The Houstonian Golf and Country Club in Richmond, Texas, as it pertains to changing water sources.

HISTORY OF THE FACILITY

Both golf facilities are located on the same 470 acres of suburban Houston. They also share one pump station currently fed by well water. Close to 20% of the property consists of lakes, ponds, and wetland areas. The largest lake covers 60 acres and was part of the original property, which was dredged and enlarged during construction. Only the 15-acre lake is fed by well water; all the others rely on surface runoff and can be filled with the irrigation system when levels drop below an acceptable point.

The two wells can supply about half of the maximum flow of 3,800 gallons per minute to the irrigation lake. This lake has a great holding capacity and could supply about one week's worth of water during peak season before needing to be resupplied. Another advantage is the fact that this lake is higher than the others and is situated next to the largest lake. The height advantage also afforded the architect



Water will be diverted into the pond in the foreground. Multiple ponds can be interconnected for increased storage. Water transfer can be creative and add aesthetic features to the course.

with the opportunity to incorporate a waterfall, which is not naturally occurring in the Houston area, but it looks attractive on a golf course.

Up until a few years ago, the thought of changing water supplies was far from anyone's mind. The facilities were relatively new (opened in 1999) and well water was the logical irrigation source at the time. It was as simple as acquiring a permit and starting the irrigation system. Except for an annual permit fee for both wells, there was no charge for the amount used, unless the clubs exceeded their original allotment.

At the time the courses were under construction, the surrounding area was largely rural, but civilization was creeping in at a rapid pace. Growth in Fort Bend County is largely residential, with the usual amount of retail growth. Residents enjoy the good life in the country and choose to commute to work in the more industrialized nearby Houston area. Within five years, the two courses will be surrounded by subdivisions (there are no houses on the property). These residents will need potable water supplied by underground wells.

A GRADUAL REDUCTION OF GROUNDWATER USAGE

The Fort Bend County Subsidence District oversees the permitting and

monitoring of all underground water in the county. The newly imposed rules state that every entity using more than 10 million gallons of groundwater per year shall use a different water source or face administrative penalties. It is not uncommon for the two courses to use 10 million gallons of water in a week during the growing season. Conversion requirements in our district state that:

- By January 2008, a Groundwater Reduction Plan (GRP) must be filed with the subsidence district.
- By the year 2013, groundwater usage must be reduced to a maximum of 70%.
- By the year 2025, groundwater usage must be reduced to a maximum of 40%.

Developing a GRP is made easy when you have help from the outside. A newly formed organization known as the North Fort Bend County Water Authority (NFBCWA) has since been created, and its mission is to reduce groundwater use in our area. We no longer get our well water for free, even with a permit (\$5,000 annual charge). What got our attention rather quickly was the proposed 20% price increase every year starting in 2008. Annual water costs for our facilities would go from \$40,000 to close to \$300,000 by 2025. That number was a shock to everyone.

As mentioned earlier, not too long ago the surrounding area was largely rural, and the planned subdivisions were only the dream of future land developers. Effluent water just eight years ago was not an option due to lack of supply. This is not the case any longer, and fortunately the nearest treatment plant is within one mile of the property. In our area, water usage and disposal is managed by a Municipal Utility District, or MUD. MUD district officials approached us and other end users with the proposal to supply non-potable water of the highest

property line and will be metered from there. The distance to the irrigation lake from this point is approximately 700 yards, and the distance will help disperse any solids in the effluent water. It is simply a matter of diverting this water from one lake to the other. Diversion is even easier, as the two lakes are 20 yards from each other. The distance from the diversion spigot to the irrigation intakes is another 150 yards, further aiding in solid dispersal.

The cost of the diversion device (we chose a submersible system) came in at \$25,000 and has since been installed.

of water over time, even with the capital expenditures necessary. Thirdly, we can lock down pricing and availability for 50 years. Lastly, the life of the underground wells will be increased through lower usage.

There are some negatives associated with the use of effluent water. The greatest concern is the quality as compared to well water. Our current management practices will have to be altered in the future and may put a slight burden on the memberships at both golf courses. This burden may come in the form of increased aeration



This photo shows the installation of a submersible diversion pump so another structure is not seen on the golf course. The maintenance of submersible pumps is not difficult.

quality type (TYPE 1). The MUD also needs our water credits as part of the process and must assess a reasonable fee structure to recoup the expense of the pipeline to the property. Once the water gets to the property, the expense of getting it to the irrigation lake becomes the responsibility of the owner.

HOW DOES THE WATER GET TO US?

The process of signing off on this proposal looked good on paper, but other costs needed to be factored in. Fortunately, one of the fingers of the largest lake is situated 30 feet from the property line, so there would be no damage to the property from the pipeline construction. The proposed effluent supply line will come to this

Irrigation heads and valve covers will need to be converted to the non-potable, light purple color at an estimated cost of \$40,000. Some of the fairway heads have already been converted. Permeability testing of the clay lining in all lakes also was performed at a cost of \$10,500.

WHAT HAPPENS NOW?

Actually, nothing has changed yet, and construction of the effluent pipeline has not yet begun, but we are ready when it does proceed. After careful consideration, we decided it best to use at least 70% effluent water (or as much as the supplier can send us) and make up the balance with well water. First and foremost, it is the right thing to do. Secondly, we can reduce the cost

and use of products such as lime and gypsum to maintain soil pH. My impression is that only the most discerning golfers will notice. It will be our task to keep them educated. We have already informed our membership advisory committees of the conversion process. After all, they are the ones who will benefit in the long run.

AUTHOR'S NOTE: I would like to thank James Edgmon, golf course superintendent at The Houstonian Golf and Country Club, and Bill English, formerly with Redstone Golf Management for their help in writing this article.

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