



Dunes Community Development District • Flagler Beach, Florida

“Filtering Reclaimed Water”

The state of Florida’s population is growing by more than 1,000 people per day. This phenomenal growth is certainly beneficial to the state’s economy; although, it comes with a demanding toll on precious natural resources. Every person and business that migrates to Florida is competing with the finite supply of fresh water. Traditionally, the primary source of water has been groundwater; however, the state of Florida has shown a great deal of foresight in encouraging the development of alternative water supplies to meet the ever-increasing water demands. Reclaimed water is one of these alternative supplies and the state of Florida can be proud to be a national leader in the use of it. Over 60 percent of all reclaimed water in the state of Florida is being used for agricultural and landscape irrigation, with the balance used for ground water recharge and industrial use.



Ocean Hammock–The Dunes

Located in Palm Coast, Florida is the Dunes Community Development District made up Hammock Dunes, Island Estates and Ocean Hammock. This rapidly growing residential and golf course community is bounded by the Atlantic Ocean on one side and the Intercoastal Waterway on the other. The 2,120 acre development is an excellent example of the efficient use of reclaimed water. The Dunes Community Development District supplies reclaimed water for irrigation to residential and common areas, as well as two golf courses. Total usage is approximately 690 million gallons per year (1.9 million gallons per day). The reclaimed water is provided by the Dunes Community Development wastewater treatment facility (Dunes Utilities). The reclaimed water coming from Dunes Utilities flows into three lined reclaimed storage ponds, which is then pumped throughout the purple reclaimed water piping system by three irrigation pump stations.

One major obstacle that had to be overcome was related to the filtration of the reclaimed water. As the reclaimed water flows into the open ponds, the water quality significantly deteriorates when exposed to sunlight and the open atmosphere. One can commonly find sediment, algae, snails, mussels, bloodworms and other creatures present in reclaimed water ponds.



Miller-Leaman’s automatic Turbo-Disc Filter system installed at Dunes Utilities; current filtration capacity is approximately 4,500 GPM

Other than a coarse strainer, there was no filtration equipment previously installed on the system, resulting in constant sprinkler plugging. The first step towards resolving the problem was the installation of manual filters in (15) zone locations. This solved the problem of sprinkler orifice plugging; however, the manual filters proved to be labor-intensive, sometimes needing to be cleaned on a daily basis. Dunes Utilities sought out various filtration technologies, which would handle the water quality present in the reclaimed water holding ponds while minimizing manual maintenance.

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Miller-Leaman's fully operational trailer; used for demonstration and water testing purposes

The filtration system was designed and manufactured by Miller-Leaman, Inc. of Daytona Beach, Florida. Miller-Leaman, in business since 1991, manufactures a range of unique and innovative filtration products including a fully automatic, self-cleaning disc filter technology called the *Turbo-Disc Filter*.

The *Turbo-Disc Filter* is particularly well suited for organic contaminants typical of open reclaimed water ponds (and surface water applications in general) because the filter media is three-dimensional, unlike a screen filter which is two-dimensional. As water passes through the disc media, the depth of the discs captures the soft fibrous contaminants which can extrude through a two-dimensional screen filter. As the differential pressure across the filter system reaches an adjustable set point, the *Turbo-Disc Filter* goes through a backwash cycle,

sequentially flushing each filter housing until the entire filter system is clean. Other desirable attributes of the *Turbo-Disc Filter* include a small footprint and a minimal amount of backwash water volume compared to other automatic filters (i.e. sand filters).

Initially the thought was to install (15) automatic *Turbo-Disc Filters* to replace the various manual filters at each zone location. After further discussion between Dunes Utilities and Miller-Leaman, it was concluded that a large central filtration system was the most cost-effective approach. In an effort to familiarize the Dunes with their *Turbo-Disc Filter* technology, Miller-Leaman transported their fully operational demonstration trailer to the site. The demo trailer has the ability to pump water from the actual water source to determine the solids' loading (PPM), the particle distribution size and other important variables. The filter housings in the demo trailer are transparent, allowing the customer to visualize the effectiveness of the filter, both in filtration and backwash modes.

After the demonstration, Miller-Leaman worked with Dunes' personnel to properly size the *Turbo-Disc Filter* system, as well as customize it for their needs. For example, because of the proximity to the ocean and the corrosive environment it presents, all the manifolds on the filtration system were fabricated out of Type 316 stainless steel versus standard Type 304 stainless construction. The system was also designed modularly, so it could be expanded over time as the Dunes development grows and the reclaimed water demand increases. Miller-Leaman was also contracted by the Dunes to fabricate custom stainless steel manifolds, allowing additional *Turbo-Disc Filter* modules to be added over time. The first system was designed to accommodate 3,000 GPM; since then an additional filter module has been added to accommodate the current demand of 4,500 GPM.



Custom Type 316 stainless steel manifolding fabricated by Miller-Leaman to accommodate future expansion of the *Turbo-Disc Filter* system