The Elimination of Fecal Coliforms and *E. coli* in Lagoons

by

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Many horse racetracks throughout the world are designed to drain water from the track into a lagoon that is located in the infield of the track. Due to the track being predominantly used for horse racing, there is a high amount of fecal coliform, especially of the *Escherichia coli* species, bacteria in the water that drains from the track. During the racing season, fecal coliform and *E. coli* counts increase dramatically and the subsequent drainage of these lagoons can become a problem for the receiving waters.

In early 2011 an engineering firm contacted Reliant Water Technologies concerning this problem at a major track in the northeastern U.S. The track was under pressure by the state's Department of Environmental Quality to perform some type of cleanup of the water before it was allowed to enter a small stream that was adjacent the track. Reliant Water specializes in rehabilitating waste lagoons, and assisting waste lagoon owners in making their lagoon outfalls compliant without the need for expensive dredging services.

The subject lagoon is just over 3 acres in size, holding over 3 million gallons of water, Figure 1. Upon investigation it became apparent that the lagoon exhibited an excess in coliform contamination primarily during the warmer months of the year, while daily racing was taking place. During the winter, when there was no equestrian activity on the track, analyzed water samples exhibited little or no bacterial populations.

Figure 1 – Three acre racetrack infield lagoon.

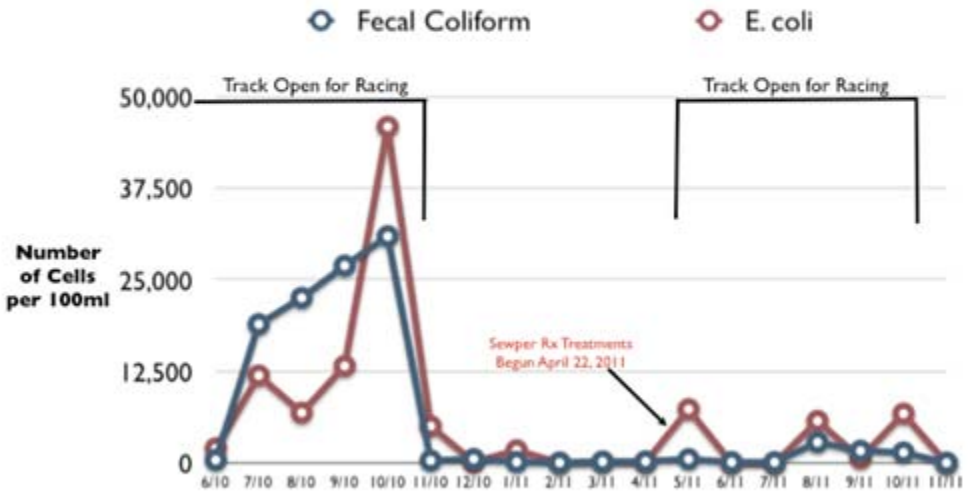
Reliant Water's proposal was to utilize a Reliant Model WQA Water Moving Aerator in the lagoon in order to move the bottom sediments while aerating the water. This sediment movement would free any excess coliform bacteria that might inhabit the lagoon's bottom sediments while aerating those sediments so natural bacteria would be able to populate the sediments. The aerator would require an Ice Option so that it could operate throughout the winter when ice formed on the surface of the lagoon. Additionally, Reliant proposed periodically adding a patented poly-microbial sludge reducing product to the water, called Sewper Rx. This product had previously been proven to successfully attack and eliminate fecal coliform species, including *E. coli.*

In March 2011 Reliant Water received the go-ahead to move forward on the project and on April 22 a Model WQA aerator was installed, see Figure 2. The aerator was located in such a way as to move the water throughout the entire lagoon, even around a small island that was located in the lagoon for picturesque purposes. It was estimated that well over twice the volume of the lagoon's water content would move through the aerator daily. At the same time that the aerator was installed, the first treatment of Sewper Rx sludge digestant was made. The track's maintenance staff was left with future periodic, treatment instructions to enhance the product's poly-microbial population throughout the summer and fall months.

Figure 2 – Reliant Water Model WQA Water Moving aerator in racetrack lagoon.

The track opened in May for practice, and later in the month the racing season opened. As the summer months progressed, it became apparent that the Reliant Water process was working. By the end of June there was almost zero fecal coliform or *E. coli* in the lagoon's effluent water. Normally, on an annual basis, the June readings of both the target organisms exceeded 10,000 cells per milliliter of sample water. Throughout the racing season, and into the fall, the numbers remained at near zero cell counts. There were some spikes in *E. coli* counts, but it was determined that Sewper Rx treatment schedule adjustments would eliminate the spikes in the future. A 1.5 year graph was produced to show the results of the Reliant process, see Figure 3.

Figure 3 – Model WQA Aerator & Sewper Rx Effects on Racetrack Lagoon



In 2011, it was proven that the high levels of fecal coliform and *E. coli* found in horse racetrack drainage lagoons could be reduced, and eliminated, by the use of two unique products that had been developed specifically for waste lagoons. For tracks that utilize these types of lagoons, the ability to meet their state's environmental effluent permit requirements and eliminate the concern of non-compliance fines, has finally become a possibility.

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