

AbTech's Smart Sponge® technology reduces damage from harmful microorganisms spilling into Scarborough Beach's bathing waters

Case Study

Rhode Island's Scarborough State Park Beach Stormwater Management Project

This stormwater management project was implemented to improve water quality at Scarborough State Park Beach, a popular recreation area that attracts over a half million people in the summer months. The beach is located in the coastal community of Narragansett, Washington County, Rhode Island, at the southern end of Narragansett Bay at Rhode Island Sound.

In 2003, Scarborough Beach closed six times because of high levels of bacteria. Following those closures,

Rhode Island's Departments of Transportation, Environmental Management, and Health formed a team committed to remedy the high bacteria concentrations. In June 2004, Rhode Island Governor Don Carcieri officially launched the team project. The core of the solution involved diverting the runoff from Scarborough's stormwater outfalls through pipes containing Smart Sponge® Plus, an antimicrobial filtration material developed by AbTech Industries.

Project Challenge

In spite of the federal Clean Water Act passed in 1972, pollution of our nation's waterways has steadily increased. In 1998, the U.S. Environmental Protection Agency (EPA) identified urban and storm water runoff as the leading cause of impaired water quality and reported that over 40 percent of our nation's waterways are unsafe for human health. In 2003, the Natural Resources Defense Council sited 18,000 days of closings and advisories at ocean and lake beaches, an increase of more than 51 percent from 2002. Nearly 90 percent of these closings were caused by the presence of bacteria associated with fecal contamination. Today the situation is still critical.

This national environmental threat has not escaped Scarborough State Park Beach. Bacteria, grease, trash, sediment and oil pose a threat to Scarborough's water quality, with bacteria posing the greatest health danger.

Project Description

Cindy Baumann, Director of Engineering for Crossman Engineering, was chief consultant on the project and designed a system of pipes running parallel to existing pipes that exit into the bay at the north and south ends of the beach. The new drainage piping was filled with the Smart Sponge Plus, a patented antimicrobial material that removes contaminants, destroys bacteria, and improves the water quality. Runoff from the stormwater outfalls surrounding the beach was diverted to the new drainage piping and filtered before being discharged into the bathing waters.

The Smart Sponge Plus has been highly successful in treating Enterococcus, E. Coli, and Fecal Coliform in stormwater applications. According to Baumann, the decision to use AbTech's Smart Sponge Plus technology was arrived at after the project team evaluated various Best Management Practices (BMPs) for treating bacteria within stormwater runoff.

Smart Sponge Plus had not previously been used in this type of application, but it had proven effectiveness for removal and reduction of bacteria concentrations in stormwater runoff with the Ultra Urban Filter® Catch Basin Insert. These filtration systems encapsulate and remove harmful substances, including hydrocarbons, oil, grease, and other toxins, before they enter waterways.

"We evaluated other BMPs such as storage and pumping to a waste water treatment facility, ultraviolet disinfection, chlorination and de-chlorination systems, infiltration systems, constructed wetlands, and rock filters. After eliminating these BMPs because of site constraints, costs, or resulting hazardous material requirements, we selected the antimicrobial filter material, Smart Sponge Plus," Baumann said.



AbTech Industries' Solution

Rodolfo Manzone, Ph.D., AbTech's Executive Vice President and Chief Technology Officer, said, "The Smart Sponge Plus employs an antimicrobial agent that acts by rupturing cell membranes—preventing potentially harmful microorganisms from functioning, developing, or reproducing."

Based on the results of sampling tests conducted in dry and wet weather at Scarborough Beach, the system was effective at reducing and removing bacteria from stormwater runoff. The maximum removal rates for fecal coliform ranged from 89.4 to 99.8 percent. In the sampling process for Enterococcus, the maximum removal rates ranged from 96.2 to 99.9 percent.

AbTech Industries, headquartered in Scottsdale, Arizona, is dedicated to developing innovative clean water solutions to meet community and industrial needs. It produces Best Management Practice (BMP) equipment for nonpoint source pollution and storm water control, filters for storm drains and catch basins, and devices that skim and capture oil from still or flowing water. AbTech's products are based on Smart Sponge®, its proprietary polymer-based filtration material, that is fully recyclable and provides a complete, closed-loop solution for removing pollutants from water. AbTech filtration systems are currently filtering contaminants from urban and stormwater runoff in 28 states.

What Others are Saying about the Project

"Although the Smart Sponge Plus can be used in multiple applications, we were the first in the nation to use it in a pipe application. After extensive testing, we have complete confidence in the Smart Sponge Plus's antimicrobial capabilities."

Edward Szymanski, Environmental Associate Chief Engineer
Rhode Island Department of Transportation

"The system includes a new drainage piping filled with an antimicrobial material called the Smart Sponge Plus developed by AbTech Industries. The Smart Sponge Plus destroys bacteria and has been successful in treating Enterococcus, E. Coli, and Fecal Coliform in stormwater applications. In addition, the material is non-toxic and fully recyclable."

Cindy Baumann, Director of Engineering, Crossman Engineering

For more information about the Smart Sponge® technology,
visit www.abtechindustries.com or call 1-800-545-8999.

