GAC Brings Home the Bacon
GAC Vertical Contactors

Case Study

Location
Tar Heel, North Carolina

Owner
Lower Cape Fear Water & Sewer

Engineer
Camp, Dresser & McKee

Contractor
Ruby-Collins, Inc.

Problem

The Lower Cape Fear Water & Sewer Authority (LCFWSA) manages and distributes water for multiple counties in North Carolina. Municipal drinking water was previously drawn from deep raw water wells in the Upper Cape Fear aquifer.

Aquifer Depletion

Studies were completed to learn how to maintain a reliable and sustainable water source for the Upper Cape Fear aquifer. These studies showed that, with the amount of water drawn from the aquifer, resources were quickly depleting and another water source was needed. The Smithfield Packing Plant uses up to 3 MGD from the aquifer to raise, feed, slaughter, cool, and package pigs for pork distribution. Packaging more than 32,000 hogs per day, the Smithfield Plant is the world's largest pork processing facility.

As one of the major water users from the aquifer, the Smithfield Packing Plant teamed up with the LCFWSA to find a more reliable water source and to protect the aquifer.

New Water Source Challenge

The Lower Cape Fear River was selected as an additional water source and plans were laid for a new 4 MGD treatment plant to be located along the river in Wilmington, NC. The new plant would be easily expandable to 6 MGD and would have the potential to reach 30 MGD as demand increased.

To treat this raw water, conventional water treatment technologies and pressurized granular activated carbon (GAC) contactors were selected. In September, 2009, WesTech was chosen to provide three vertical pressurized contactors with bituminous, coal-based, activated carbon.

Granular Activiated Carbon is commonly used for adsorption applications, e.g., taste, odor, TOC, SOC removal.

Equipment Selection

GAC media was selected because of its ability to remove disinfection by-products, synthetic inorganic compounds, taste and odor that are found seasonally in the Cape Fear River. With a sound hydraulic design, WesTech's GAC contactors are built to maximize the loading of organics onto the carbon. Proper design of the GAC contactor vessel is critical to ensure effective and efficient

GAC Vertical Contactors	
Quantity	3
Size	12 ft diameter
Media Type GAC	GAC
Capacity	40,000 lbs GAC
Design Hydraulic Loading Rate	4.6 gpm/ft2
Empty Bed Contact Time	8.75 min
Backwash Flow Rate	15 gpm/ft2

use of the GAC media. Vessel design affects the frequency of GAC replacement, the ease in which the GAC is replaced, and the overall life of the vessel. WesTech's experience and track record helped ensure that the LCFWSA was supplied with a robust system that was designed to remove high levels of total organic carbon (TOC).

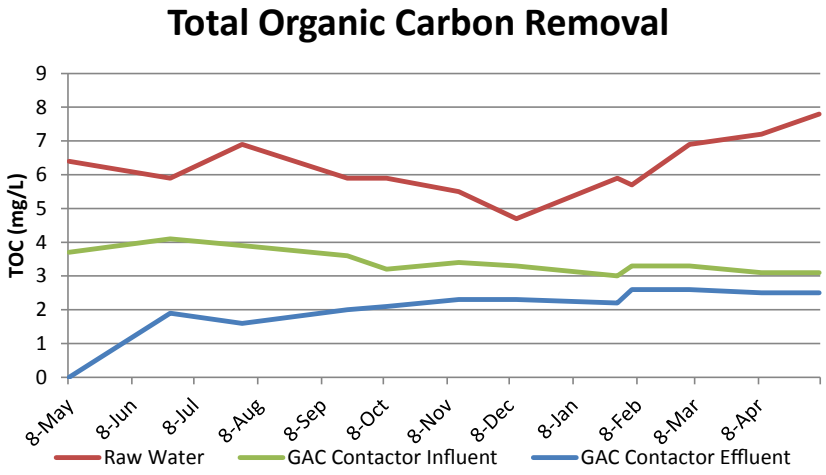
Granular Activiated Carbon Pressure Filters

Superior Solution

The new water treatment plant provides an effective solution to protect the existing groundwater supply, reduce drought risk, and continue providing quality water for the Smithfield Packaging Plant as well as the users in North Carolina.

The new plant also provides the infrastructure needed to support future economic development in the region, as it is able to expand its capacity to meet future demands.

With the help of WesTech's GAC contactors, LCFWSA is able to provide clean water to its users, as well as a safe solution for protecting the environment.



WesTech®

Swire Water

westechwater.com | 801.265.1000