



ETS-UV™ DISINFECTION

NORFOLK SOUTHERN

Norfolk Southern wanted to ensure that potential bacteria would be removed

ETS-UV™ SYSTEMS TREAT REUSE WATER FROM A STORMWATER POND TO WASHDOWN COAL CARS FOR DUST CONTROL

Customer Profile

Norfolk Southern has a history of nearly two centuries of service that has linked communities and customers to the marketplace of the world. The railway company operates approximately 20,000 miles of rails and serves every major container port in the eastern United States while providing connections to other rail carriers.

Norfolk Southern's Lamberts Point Coal terminal is a coal transload facility located on the Elizabeth River in Norfolk, Virginia. The heart of the terminal is Pier 6, where oceangoing colliers are loaded with metallurgical and steam coal used to produce steel and electricity worldwide. Twin tandem rotary dumpers feed the shiploaders for a combined dumping capacity of up to 8,000 tons per hour. The versatility offered at Pier 6 allows the loading of vessels that range in size from small coastwise barges to large capsized vessels.

Challenge

In an effort to continue the model of sustainability and to continue the commitment of environmental stewardship, Norfolk Southern wanted to reuse the water from a stormwater pond to wash down coal cars as they are being loaded for the purpose to control dust. Before reusing the stormwater, Norfolk Southern wanted to ensure that potential bacteria in the pond water, such as Enterococci, E. Coli, and Fecal Coliform, would be removed.

The Solution

After consideration of a variety of processes, ETS-UV systems were selected because of the proven ability to disinfect wastewater.

Two SW-425-6 systems were selected for this project. The two units, arranged in parallel are preceded by a GAC system that removes the coal fines and other larger contaminants prior to UV disinfection. The UV disinfected water is then pumped and used for the wash-down of the cars.

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Industry

Reuse, Dust Control

Challenge

Norfolk Southern wanted to ensure potential contamination of bacteria was removed from the reuse water used for coal car washdown

Keys to Success

Finding a system with proof and record of performance was necessary

Solution

Two ETS-UV systems were chosen because of their proven ability to disinfect wastewater, unique design features and energy efficiency



Shown above is Lambert's point Coal Terminal

The Solution Cont...

The project has enhanced health of the river's ecosystem by reducing stormwater runoff and by conserving water. The recycling of this system has reduced its use of municipal water by approximately 1.5 million gallons per month.

"This is the kind of sustainability project that we love to do. It was voluntary, goes beyond government compliance, and has ecological and economical efficiencies."

Blair Wimbush

VP Real Estate & Sustainability Officer

Norfolk Southern

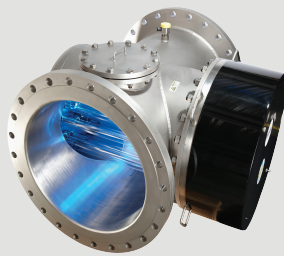
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Operating Parameters

Peak Flow	500gpm
TSS	<20 mg/l
Iron Concentration	<0.1 mg/l
Influent Fecal Coliform	<2,000/100 ml
Influent E. Coli	<2,000/100 ml
Influent Enterococci	<2,000/100ml
Effluent Fecal Coliform	<14/100 ml monthly geometric mean; <35 daily maximum
Effluent E. Coli	<11/100 ml monthly geometric mean
Effluent Enterococci	<11/100 ml monthly geometric mean; <24 daily maximum
UV Transmittance @254 nm	>55%
Min/Max Water Temperature	40°F/85°F

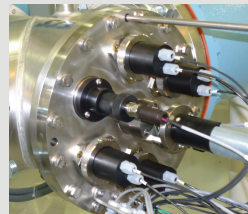


Special ETS-UV™ Design Features:



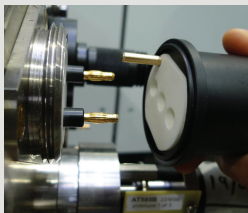
Access Hatch

The hatch was designed to eliminate flow disruptions and air pockets. This feature makes it easier for routine maintenance.



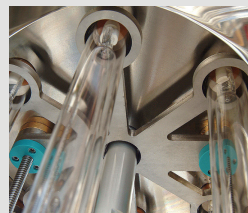
Energy Efficient Motor

Low voltage, 24V motor leads to safer, smaller and less expensive wiper option without impacting performance or cleaning capabilities.



Plug & Play Connection

Single-ended lamps utilize a twist lock plug connection that automatically centers the lamp. This is safer for operators and maintenance crew and eliminates the need for tools.



One Piece Wiper Ring

Viton wiper rings fit directly onto the stainless steel yoke. This design reduces the number of components.



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