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Congress Debates Wastewater Blending Rules

By Patrick Crow, Washington Correspondent—

Wastewater blending was defended at a House Water Resources and Environment Subcommittee hearing in April.

To handle excess flows during heavy rains or snowmelts, sewage plant operators sometimes treat all the wastewater with the primary clarifier, then route a portion of the peak wastewater flow that exceeds the capacity of the plant's biological treatment unit around that unit. The flow then is recombined with the rest of the wastewater flow that went through the biological treatment unit to receive chemical disinfection treatment.

Rep. John Duncan Jr. (R-Tenn.), subcommittee chairman, said there has been a great deal of confusion and misinformation about the issue while the Environmental Protection Agency (EPA) works on a formal blending guidance.

"In some parts of the country, states issue permits that allow wastewater treatment plants to discharge blended wastewater during periods of heavy rain or snowmelt. Some of these permits also impose conditions requiring additional treatment of this wastewater. All of these permits require the wastewater treatment plant to meet all applicable Clean Water Act standards before it discharges blended wastewater into a river or lake," Duncan said.

"In other parts of the country, states cannot issue permits that allow blending because the EPA Region will veto the permit. That is the situation in Tennessee.

"That means, in Tennessee and many other states, wastewater treatment plants may have to build additional treatment capacity and additional storage capacity — which could cost over $100 million at a single plant — to handle heavy wastewater flows that only occur once or twice a year."

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Moving Bed Filtration Helps Plants Meet Tougher Regulations

It is safe to say that every wastewater treatment facility in America has as its minimum goal the achievement of all applicable EPA and State criteria for BOD, nitrogen, phosphate and suspended solids (TSS). No one wants to be out of compliance. However, aging equipment, increased loading, and increasing volumes, combined with a reduced availability of funds and funding is creating a conundrum for the industry's operators unlike any in modern history.

Water Privatization: Debating Merits for Public Water Systems

By Joan B. Berkowitz——

The Environmental Protection Agency estimates a shortfall (gap) of approximately $224 billion in the funding required to repair and replace aging water and wastewater infrastructure in the U.S. over the next 20 years. The prospects for increased federal funding are dim.

EPA's Assistant Administrator for Water wrote in 2003, "While Federal subsidies for investment in drinking water and wastewater infrastructure would help finance needed investment Federal support will not address the entire need."

To avoid dramatic increases in water and sewer rates, communities would do well to conduct a serious debate on the question, "Can we take advantage of the technical expertise, operational efficiency, and financial resources of the private sector, without compromising the quality of service, and if so, how?" No single answer will apply to every community.

Water is essential to life. The responsibility for ensuring clean water rests with the public sector and cannot be delegated. How that responsibility can best be met is a matter for debate. The choices that have been and that continue to be re-examined by U.S. communities are

- Public ownership and operation
- Private ownership and operation (privatization), and
- Public ownership and private operation (public-private partnership).

Communities that have opted for private involvement have done so for two principal reasons —to reduce operating costs and to improve compliance with environmental regulations. For the most part, both objectives have been met.

Many of the privatized facilities (privately ere never under public ownership. They have been providing clean aff munities they serve for many years. The change in the tax law in 1997 ma ctive than public-private partnerships. Nonetheless, Aqua America (former Corporation) has had continued success in acquiring publicly owne Serving very small communities.

Public-private partnership er privatization: The public retains ownership and control over the olvement can be cancelled more easily if desired.

The public entity ret suring that the private partner operates the facility in the public's in es charged to consumers for water or sewer services. The private part ated to provide specified services at an agreed upon price. Revenu partner do not depend in any way on the rates set by the public par

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Bioscrubbing Solves Lift Station's Odor Problem

EDITORIAL FEATURE

Bioscrubbing Solves Lift Station's Odor Problem

The odiferous air is drawn into the system and passed through the biobed. As the air travels through the bed microorganisms feed on the odor-causing substances as they are dissolved and dispersed in the circulating water. The clean exhaust gas is then vented to the atmosphere through a mixed flow exhaust fan.

Like many municipal wastewater-treatment authorities, JEA in Jacksonville, FL, is serious about controlling odors from its facilities. When the flow to one of its lift stations increased as a result of growth in the community, hydrogen sulfide emissions increased as well, to around 100-150 ppm at the wetwell vent without ventilation. That prompted JEA to start looking for a solution to the accompanying odor problem.

"We have as a goal zero odors outside our facility," said Colin Groff, P.E., JEA's Manager of Technical Services. "So when we get them, we immediately react.

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"JEA is a very progressive company. We're a big believer in technology. We're trying to lower our costs to our customers using new technology. We have a lot of freedom to try new things, so I'm always looking for new technology to evaluate.

"One of the things we're trying to do is find as much equipment as possible that is 'green' technology—in other words, biological rather than chemical technology," he said.

With that in mind, JEA partnered with the Duall Division of Met-Pro Corp. (Owosso, MI) to pilot-test Duall's new AroBIOS™ bioscrubber at the lift station.

"We had seen Duall at a show and talked to them about it. Because we were considering biological technology as an alternative approach we decided to do some short-term tests," Groff said.

AroBIOS is a biological process that uses the concept of bio-scrubbing to treat gaseous odiferous compounds emitted from sewage treatment plants, said Greg Kimmer, Vice President and General Manager at Duall. It combines biological trickling filter technology with microorganisms that live within a unique biobed media called AroPAC™. Unlike conventional scrubbers, it does not require the use and storage of chemicals.

The odiferous air is drawn into the system and passed through the biobed. As the air travels through the bed, during a contact time of typically 8–12 seconds, the microorganisms feed on the odor-causing substances as they are dissolved and dispersed in circulating water. The clean exhaust gas is then vented to the atmosphere through a mixed flow exhaust fan.

Test Results

Duall installed a 400 cfm AroBIOS bioscrubber designed to treat up to 120 ppmv of hydrogen sulfide at JEA's lift station. The system has been in operation for more than a year, and test results were quite promising. According to Larry Cole, Duall Division Project Manager, "Efficiencies greater than 99% were achieved at a 10-second gas retention time (GRT) with inlet H_2S concentrations ranging from 3.9 ppmv to 27.7 ppmv, and outlet concentrations as low as 0.03 ppmv were obtained."

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An unexpected power outage provided an opportunity to study how the system responds to upsets and to analyze the recovery period. The recirculation and nutrient pumps were shut down for three days causing the biofilm layer to dry out and significantly deplete the bacteria population. Fortunately, the mixed flow exhaust fan continued to dilute and disperse odors.

When power was restored, the pumps were restarted and the system put back into operation with a GRT of 15 seconds. Two hours later, a removal efficiency of greater than 95% was observed; the efficiency dropped throughout the day until stabilizing at 90% 12 hours later, and then gradually increased to around 96% on the third day, Cole said.

Four days into the recovery period, the loading rate was raised to as high as 44 ppmv by augmenting the inlet stream with H_2S gas. Doubling the H_2S loading rate helped to increase the bacteria count, although it did not affect the rate of increase in removal efficiency, he said.

Prior testing had indicated that when a moderate upset occurs, such as loss of nutrient feed, the bioscrubber requires about three days to return to 99% efficiency. Altering the operating conditions during the recovery period appears to stress the AroBIOS system, which lengthens the recovery time. After a serious upset, such as loss of recirculation water through he biobed, a recovery time longer than 3–5 days is required, Cole said.

> " We're installing odor control equipment at seven or eight stations a year. Our goal is to be more proactive. Odor control personnel conduct baseline testing and monitor the incoming airflows, looking for increases. We try to install equipment before we get a complaint."

"So far, our tests have been very good. We're very, very pleased with the system," Groff said. "We'll start requesting bids from Duall when we need equipment at other facilities.

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Groff noted that JEA is trying to move away from chemicals and chemical scrubbers because of the high operating costs for the consumables. Vapor-phase treatment, such as the AroBIOS bioscrubber, involves a higher capital expense, but "with a biological scrubber, operating costs may be $1,000 a year, while the chemicals for the same level of liquid-phase treatment would cost around $100,000 a year," he said.

The key to good odor control, he said, is the use liquid-phase chemical treatment where it is not possible to do vapor-phase treatment. For example, when the sulfur compounds are in the water, they can be treated with chemicals to prevent them from forming H_2S in the air. But, he added, chemical treatment "is very, very expensive."

"JEA prefers vapor-phase treatment at specific locations such as pump stations because H_2S is concentrated at one location. This is a much less expensive way to treat the odor from an operating standpoint. You have to spend money on the equipment, but that's a one time capital cost, spread over a 10-year period, which is the typical life cycle of the equipment." **WW**