Basin Basics: How To Remove More Sludge And Less Water During Clarification

Once the sludge has settled, what's the most efficient way to remove it? John Stevenson, Product Line Director at Brentwood offers insight and solutions to common sludge-removal problems in this Q&A with *Water Online*.

What do wastewater operators look for in a sludge removal system? What separates the good from the bad?
Often, we receive phone calls from operators with an existing, traditional tube-shaped header vacuum system that is either clogging or unable to remove settled solids at a fast enough rate to manage the sludge blanket depth. This eventually results in having to take the basin out of commission to manually clean it. Operators want a reliable vacuum system that will resist clogs, keep up with the sludge production, and waste less water.

What maintenance, performance, and cost issues are associated with frequent clogging of dredge traditional vacuum systems?
Most of the time when systems clog, basins must be taken down for manual cleaning. This puts performance of the plant at stake because manual cleaning means wasted money. It means having to drain treated water and spend the manpower doing what a vacuum system should be designed to do — clean the floor. The associated costs include the wastage of chemicals, treated water, and opportunity costs for draining treated, billable water.

What are the alternatives to vacuum-pipe designs? What is unique about Brentwood's SedVac Sediment Removal System?
Four words: *more sludge, less water*. SedVac is unique because of its triangle-shaped header that engulfs the sludge blanket and scrapes the floor. Vacuum-pipe, traditional-header designs utilize small orifices placed in various spots on the header. This header rides on a wheel and chassis approximately 3" off the bottom surface of the tank. By design, the traditional headers do not clean the floor and are limited in their ability to remove solids without clogging. When they do work, they remove twice as much water as SedVac.

Can SedVac be easily retrofitted into existing plants? What size plants/basins does it accommodate?
SedVac can easily be retrofitted into existing plants with minimal work to the basin. Swept width typically spans a width of 24', and because of its spring-loaded chassis and traction drive, has covered a length of up to 330'. Considerations to the length covered by one unit include the speed at which it is run and the number of cleaning cycles it will have to perform in a day.

The SedVac system's low profile also allows for integration with tube settlers, which, when combined, further

maximize plant efficiency and reduce operating costs.

What challenges, in addition to clogging, does SedVac address?
SedVac optimizes plant performance because it removes more sludge and less water. Water is still cheaper than dirt, which means there isn't a lot of room to waste money on the treatment process. SedVac not only cleans the basin floor, but it does so by removing half the amount of water as other systems in the market. This saves the plant a significant amount of money over the lifecycle of the product.

What are the O&M implications of the system? How much operator input and ongoing maintenance is required?
A once-a-year inspection of wear parts is generally all that is required, and the wear parts and related replacement costs of these parts is minimal.

How does lifecycle cost compare to competing technologies? What factors make it a cost-effective choice?
In a 20-year lifecycle analysis of SedVac vs. one of the more popular traditional vacuum systems, we found that even if the capital investment in SedVac were twice that of the competing vacuum system, the lifecycle cost is nearly half that of the competition. The major factor is the amount of treated water that is wasted by traditional orifice-pipe vacuum systems combined with the need for more frequent manual cleaning of the basin.

What design elements does SedVac incorporate to handle the harsh environment of clarification basins?
To keep up with the amount of sludge produced by many of today's coagulants, SedVac incorporates several design elements that make it capable of handling these harsh environments. These include the triangular-shaped headers that engulf the sludge blanket; rear elastomeric wipers that scrape the floor; a baffled "Y" connector that allows for even flow and discharge on each header; a hand-forged, stainless steel, spring-loaded chassis that is built to withstand long distances and thick sludge blankets; and hinged headers that allow the header "wings" to undulate with uneven tank floors.

What customer feedback have you received? Can you share a specific success story?
We recently went head-to-head against the traditional orifice-pipe header design at a plant in South Carolina. For nearly a year, we measured discharge sludge concentrations, flow rates, and run cycles between SedVac and the competition. The results are staggering. SedVac removed twice as much sludge in half the time, wasting 50 percent less water than the traditional header system. As a result, the plant is tearing out the old system in the adjacent bay and putting in SedVac. ■