

# From the Board

## Remembering a Failed Clarifier With No Remedy in Sight



Shirish Kardile

A large district town in Maharashtra has a 60-mld plant that gets its source water from the Tapti River, a high silt-carrier during monsoon (July–September), with total suspended solids (TSS) as high as 10,000 mg/L. The conventional surface water treatment plant is about 25 years old and consists of one clariflocculator (concentric flocculator and peripheral clarifier) and eight rapid sand gravity filter beds.

The plant's coagulants are alum and lime, but its clariflocculator consistently suffered from high TSS carryover during monsoon, resulting in frequently clogged filter beds and reduced output. However, alum and lime doses resulted in jar tests with excellent settleability.

I investigated the plant, and everything looked normal on the outside. The clarifier was huge, with a 60-m (54.8-yd) diameter. However, a closer look at the clariflocculator revealed that the vertical hangers at the bottom of the scraper and supported from the rotating bridge were twisted. Of course, the traction bridge wasn't functioning. The operator said the original rotating bridge, which was supplied by a reputable manufacturer, had hardly worked for a year or

two. It was repaired a few times, but the result was the same.

I asked the operator to show me the drain (sludge) valve and open it. I was already taken aback when I saw the 100-mm (4-in.) drain pipe. Looking at me a bit perplexed, he assured me it was the only drain pipe. Obviously, the pipe was clogged—neither water nor sludge was coming out of it. The clarifier was resting on the ground, hence the drain pipe was buried underground, as is the normal practice.

Both of us climbed to the top of the clarifier. He found a long bamboo stick and stirred the water just below the surface. A cloud of muck floated to the surface, so it was evident the 4-m-deep clarifier was full of sludge; that explained the twisted supports, too. I asked him how the clarifier was cleaned (de-sludged), and he said that once monsoon is over, the operators bypass the clarifier and remove the sludge by inserting portable submersible pumps. (In local language, these pumps are known as “jal pari” or “water angels.”) How appropriate, I thought. The manual de-sludging operation would take two to three months!

Obviously, this was a design mistake that occurred during the plant's construction and had been overlooked for more

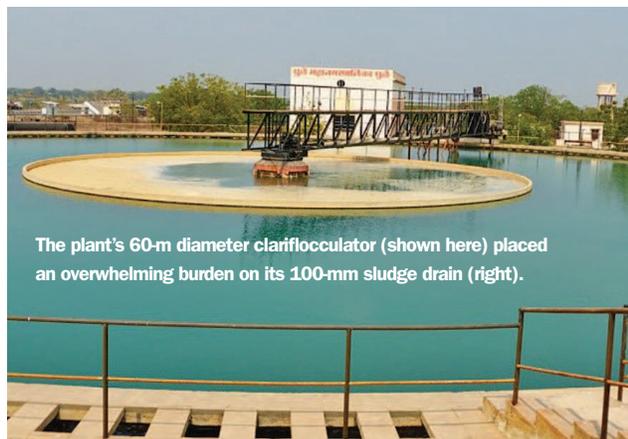
than 25 years. The disastrous result was a near plant failure! Everybody knew about this million-dollar open secret, but they obviously kept quiet about it. For such waters and such a huge clarifier, a 100-mm drain was a peanut of a pipe, like providing a 25-mm (1-in.) sewer connection to a big building complex.

Back in the municipal office, I tried to discuss a difficult but technically possible remedy. I suggested breaking the clarifier's bottom concrete slab, making a 600- × 600-mm (2- × 2-ft) wide trench, and laying a 400-mm diameter pipe from the outer periphery to the central sludge pocket—and, of course, laying the bottom concrete slab over the trench to make it water tight. It was considered a risky solution, but it was the only way out. The administrators listened to me politely, nodded their heads, and with a kind cup of regulation tea shooed me away. Their million-dollar secret would have been revealed to the world, plus they would have been required to eliminate the lucrative de-sludging maintenance contract. I remembered the famous saying, “All quiet on the Western Front.”

“Cheers to jal pari,” I said to myself, and hit the road back home.

—Shirish Kardile,

AWWAIndia Strategic Board Chair



The plant's 60-m diameter clariflocculator (shown here) placed an overwhelming burden on its 100-mm sludge drain (right).



PHOTOGRAPHS: SHIRISH KARDILE