

McLanahan Helps Stevens Creek Quarry Get Its Settling Pond Problems Settled Once And For All



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Rich Voss
Stevens Creek Quarry

For decades, workers at Stevens Creek Quarry dreaded the monthly need to drain and clean out the quarry’s settling pond for its excess slurry tailings. Every 30 to 45 days, the entire operation had to shut down for up to eight days while the pond was cleaned, costing up to \$80,000 each cleaning.

Problem

Owner Rich Voss and his son, Operations Manager Jason Voss, were frustrated by the lost time, high costs and mounting inconveniences associated with the settling pond. Natural raw materials never consolidated in the pond, so flocculent had to be mixed into the tailings to allow settling, making disposal possible at the reclamation site. Once the tailings accumulated in the pond, the plant had to be shut down for the pond to be cleaned out and made operational again. Additionally, the 170-acre operation had limited space for creating a second settling pond that would allow work to continue uninterrupted.

“It was such a problem being down for seven or eight days while the pond was being maintained,” said Jason Voss. “That and the costs of it made it a real issue for us – one that wasn’t going to go away if we didn’t find a solution.”

Solution

To find a solution, Rich Voss called on Director of Process Engineering Scott O’Brien from McLanahan Corporation and Ron DeDiemar, an industry consultant. O’Brien and DeDiemar took samples to be analyzed for potential solutions that would de-water the fines from the effluent and help Stevens Creek eliminate the need for a settling pond altogether.

After analyzing size gradations in the materials to determine the amount of easily recoverable sand, an Ultra Fines Recovery System was recommended to reduce the fines currently going to the effluent treatment solution.

O’Brien said settling tests were run to determine the settling and compaction rates, as well as underflow densities, for Deep Cone and/or High-Rate Thickeners that would remove the remaining solids in the effluent.



The McLanahan team ran filtration tests on the resulting thickener densities to find the optimal equipment combination to minimize capital costs and produce cakes that could be easily handled and used for reclamation. Rich and Jason Voss selected a Deep Cone Thickener over a traditional High-Rate Thickener as the higher-density underflow from the Deep Cone Thickener resulted in shorter press cycles, as well as lower total capital cost.

Results

Today, where the 100' x 200' (30.5m x 60.9m) settling pond once existed, Stevens Creek now has a highly convenient area for stockpiling aggregate. DeDiemar said that the quarry has been able to increase its stockpile/inventory area due to the system, which will allow the operation to expand its volume if needed.

"We've eliminated the down-time from having to shut down the operation to deal with the settling pond," said Jason Voss. "Even though the filtering is done as batches, it's going while the aggregate plant is running. That makes it so much easier, and it saves us time and money."

The Ultra Fines Recovery System has made it cost-effective to recover nominal -50 mesh x +400 mesh (38 micron) fines as a conveyable, stackable fine sand product. It recovers more than 20 TPH of the fine sand. There are 2,200 gallons per minute of nominal -400 mesh effluent pumped into a surge prep tank for transfer to the Deep Cone Thickener, which settles the solids into an underflow density of 45-55 percent solids before feeding it to the press.

The solids underflow feeds into the surge prep tank via gravity without the use of a pump, taking advantage of the head pressure generated in the Deep Cone Thickener. The solids underflow from the Thickener is then fed to the Filter Press and dewatered into cake that is 75-80 percent solids. The Press recovers roughly 30 dry TPH of filter cake, which is used for reclamation of the quarry.

The fine sand is mixed with soil and has been sold for use in soil remediation. The recycled water is available immediately for reuse in the wash plant, and thanks to Rich Voss's creativity, the filter cake is also sold as Washed Levy Fill.

Before Stevens Creek got the Filter Press, only one employee was needed to operate the entire plant. One of Voss's big criteria was to be able to keep the wash plant operation a one-person job, which was accomplished because of the ease of use of the McLanahan press.

"Working with McLanahan has been great," said Rich Voss. "They don't just come in and sell you a piece of equipment. They're here to help us figure out what we need, how to maximize our budgets and then support us as we get the system up and running. They're part of our team."

O'Brien credits the McLanahan philosophy of understanding the clients' needs and developing a custom engineered solution for the success at Stevens Creek, as well as the quality of the system.

"This equipment is field proven and offers the finest size fraction recovery available without the use of chemicals," said O'Brien. "The modular construction helped keep installation costs low, and the design made start-up faster. No chemicals or polymers are needed, and the cyclones stay clog-free. They're also large and less prone to plugging while recovering."

As a result of the new system, the quarry has realized savings of nearly \$1 million a year in costs associated with not having a settling pond to drain. In addition, they no longer have 50-75 days each year where the entire operation is shut down.

This gives Rich and Jason Voss more free time to focus on their other passion outside the quarry.

During their time off, the Voss's are the main partners in Voss Motorsports, an off-road racing team that has been gaining traction in the Best in the Desert Racing Association. Jason is behind the wheel as the driver and has multiple victories in his career. Both Jason and Rich said there are similarities between working as a motorsports team and working with a crew like McLanahan to tackle an issue like the quarry's settling pond.

"Whatever we set out to do, whether it's here at the quarry or out racing in the desert with our team, there's a team aspect to it," said Jason. "If you have a good support team and good machinery, then you're going to be successful."

With the success of the Ultra Fines Recovery and closed-loop Water Management Systems, Stevens Creek is poised for the future – both in quarrying new aggregate and expanding its recycling efforts, which Rich Voss sees as the future. "Now that we have a reliable and efficient way to recover the mesh without the settling pond, we're well-positioned for the future," he said.

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