Salmon WWTP Upgrade

SuperSand™ Continuous Backwash Filter

CASE STUDY

Location: **Salmon, Idaho**
Owner: **City of Salmon, Idaho**
Engineer: **Keller Associates**
Contractor: **Dick Anderson Construction**

Raising Requirements

Known for its many all-season outdoor recreational activities, the City of Salmon and its surrounding area is a popular tourist attraction in central Idaho. Many of the popular activities depend on the Salmon River where the city's wastewater treatment plant discharges.

Prior to an upgrade, two lagoons were used to reduce the TSS and BOD_5 levels in the city's wastewater. In 2007, the National Pollution Discharge Elimination System (NPDES) permit was renewed and treatment requirements became more stringent. The requirements of the new permit included increasing TSS and BOD_5 reduction from 65% to 85%.

During lagoon turnovers, TSS and BOD_5 levels increased. Because of this, the lagoons were not able to consistently meet the new discharge permit requirements and were negatively impacting the river.

Soon after the new permit was issued, plans were made to upgrade the wastewater treatment system to meet the new requirements and better protect the Salmon River for the next 20 years.

Solution

In order to upgrade the wastewater treament system, the City of Salmon received a waste water system planning grant from the Idaho Department of Environmental Quality. With this grant, the treatment plant chose WesTech's SuperSand™ continuous backwash filters to work with the existing lagoons for their lower cost and superior ability to further reduce BOD_5 TSS and algae.

SuperSand™

The SuperSand is an up-flow, moving bed filter that does not require additional backwash pumps or blowers. The water enters near the bottom and solids are filtered as water flows up through the media bed. As the filtered water reaches the top of the filter, it passes over the effluent weir and is discharged.

Water Quality from the SuperSand™ Filters	
	April 2015
Influent Daily Flow (MGD)	0.84
TSS Influent (mg/L)	7.63
TSS Effluent (mg/L)	2.64
Phosphorus (mg/L)	0.27

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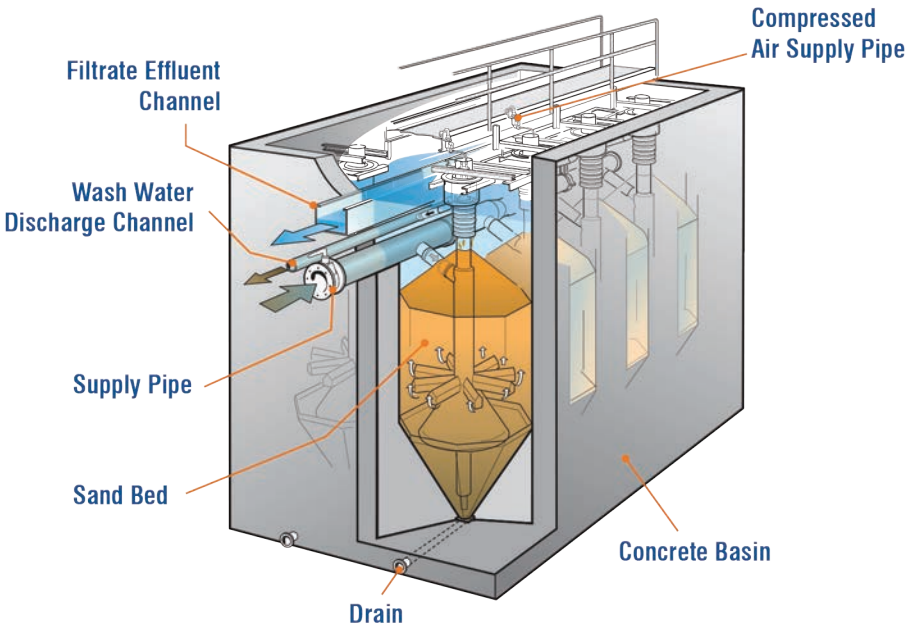
A portion of the filtered water is diverted through the sand washer, located at the top, and used for cleaning and removing the waste solids. Unlike other media filters, the SuperSand incorporates a continuous backwash rinse, eliminating the need for conventional backwash tanks and other equipment. WesTech's continuous backwash filters can be installed in a multi-module, typical sand bed configuration or as freestanding units. Due to the flow process in the Salmon Wastewater Treatment Plant, two multi-module configurations were the most efficient design.

SuperSand™ Filters	
Quantity	8 modules
Configuration	2 concrete basins 4 modules per basin
Maximum Daily Flow	2 MGD
Total Filtration Area	512 ft^2 (64 ft^2 per module)

Implementation

The City of Salmon's operators are currently monitoring the filters mostly for TSS removal. With a flow capacity of 2 million gallons per day, a dosage of alum is added as a coagulant for tertiary treatment by the SuperSand filters. The alum causes the TSS to flocculate, thus increasing the performance of the filters. The dosage of alum varies from month to month due to uncertain water quality during lagoon turnovers. The operators have been pleased with the simplicity of the process and the ease in making adjustments to the filters. NPDES permit requirements for TSS and BOD_5 removal have been met every month the filters have been in service.

Continuous Backwash Filter Module



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