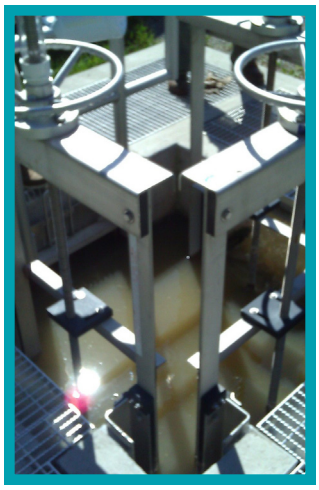
Case Study: Columbia Falls

PHOSPHORUS REMOVAL
COLUMBIA FALLS, MONTANA
(POPULATION 5,000)

Compliance with a 1.0 mg/L Phosphorus Permit; Limit without Chemicals.
Equipment Cost: ZERO
Annual Savings: fewer chemicals



Phosphorus leaching out of Columbia Falls' aerobic digestion tanks was on the verge of overwhelming the 0.55 MGD MLE treatment facility's ability to chemically remove phosphorus. After the waste sludge tanks were cleaned, changes in plant operations were made to support biological phosphorus removal. Treatment was improved without chemicals.

Adjustments to the equalization tank flow and internal recycle rates made the pre-anoxic tanks into fermenters. At an ORP of -200 mV, volatile fatty acids are formed. The VFAs fuel biological phosphorus removal and enhance biological nitrogen removal. To optimize nutrient removal, the dissolved oxygen levels in the aeration tanks were changed to provide a burst of high DO immediately following the pre-anaerobic tanks for phosphorus removal.

The facility is producing an effluent total-phosphorus of 0.5 mg/L biologically, without chemicals while discharging 5-6 mg/L total nitrogen.

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"CleanWaterOps provided process suggestions that never really occurred to us, even though we see the plant every day, and have so for years."

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