

Case Study: Tennessee Department of Environmental Conservation

Nitrogen & Phosphorus Removal with Cost Savings

One year of training and technical support demonstrated the nitrogen removal capabilities of existing wastewater treatment plants.

Contract Fee: \$85,800

Capital Savings: \$400,000 reduction in scope of Crossville's 3.5 MGD activated sludge modification.

Projected Annual Savings: \$233,000/yr. reduction in electrical consumption based on similar four month average in 2014, at Cookeville's 14 MGD oxidation ditch plant.



A combination of training, technical support, and professional collaboration involving regulators and wastewater treatment plant personnel was provided over a period of ten months. Tasks included: two days of classroom training, one professional seminar, two days of regulatory staff meetings, 16 plant visits, field testing equipment, on-going remote technical support (emails and telephone), and a series of reports.

By changing day-to-day operations at a plant not designed for biological nutrient removal, Cookeville reduced total-Nitrogen to 5 mg/L (from 20+ mg/L) and reduced total-Phosphorus to an average of 1.36 mg/L (from an average of 3.38 mg/L) while providing more sustainable treatment (no chemicals, less electricity consumed and realizing projected annual savings of \$233,000).

A 50% reduction in scope in Crossville's plant modification project will sustainably provide biological nitrogen and phosphorous removal at a \$400,000 savings. Strategies for Athens' two treatment plants – Oostanaula and North Mouse Creek – are being implemented to provide effective year-round biological phosphorus removal. Practical changes in Livingston's day-to-day operations were developed in order to maintain nitrogen removal while providing biological phosphorus removal.

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"CleanWaterOps freely shared their know-how with our operators, engineers, inspectors, and regulators with a keen understanding of the greater benefit to the water industry and the environment."