



# TONKA EQUIPMENT COMPANY

## Project Profile

### PARKER, CO WATER & SANITATION DISTRICT

#### **NORTH WATER RECLAMATION FACILITY**

Contact: Gary Walter  
Chief Plant Operator  
(303) 841-4627

#### **DESIGN ENGINEER**

*Integra Engineering*  
Contact: Mark Nance  
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#### **GENERAL CONTRACTOR**

*Weaver General Construction Co.*  
Contact: Tom Baughman  
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#### **LOCAL TONKA REPRESENTATIVE**

*Water Control Corporation*  
Contact: Clark Tuck  
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#### **APPLICATION:**

Tertiary Filter for Wastewater Treatment  
Phosphorous Removal  
Flow: 2325 gpm

#### **TONKA PROCESS EQUIPMENT:**

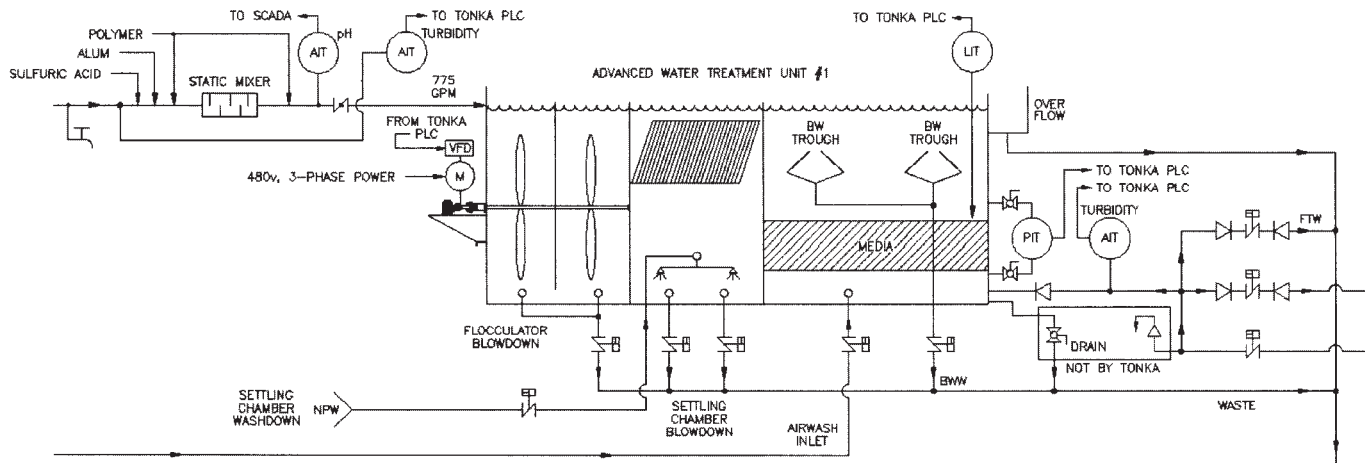
Three 14' W x 10' H x 55' L marine-grade aluminum Unitized Treatment Systems (UTS-P) with inclined plate settlers, controls, and Tonka's Simul-Wash™ backwash technology

#### **PROJECT**

Tonka focuses on treatment solutions for potable water projects. However, opportunities to apply potable technologies to wastewater applications can arise. In 2003, the Parker North Water Reclamation plant underwent a major upgrade and expansion. Included in the improvements was an advanced water treatment process for the reduction of phosphorous from the wastewater outfall. Phosphorous contributes to excessive algae growth and other plant life in receiving streams, which leads to depressed oxygen levels in the receiving body of water, threatening fish life and the ecosystem. For Parker North, the maximum allowable phosphorous concentration was set well below the limit attainable through a conventional activated sludge process. The city hired Integra Engineering to design a phosphorous removal treatment process to meet the limit.

#### **PROCESS**

The treatment processes consist of pH adjustment, followed by alum and polymer addition for physical/chemical removal of phosphorous. The removal mechanism involves two-stage, tapered flocculation, inclined plate settling, and filtration using a dual-media filter bed of silica sand and anthracite. The anthracite removes the larger floc particles, while the silica sand polishes the smaller floc particles that slip through the anthracite.



Each filter includes the value-added “Simul-Wash™” backwash system. This unique backwash system uses air and water simultaneously, at sub-fluidized rates, to provide the most effective means of backwashing granular filter media.<sup>1</sup> Tonka’s media-rejecting Simul-Wash™ troughs enable the air and water backwash cycle to continue indefinitely without media loss. This results in optimal filter cleaning efficiency and prolonged filter runs, while saving approximately 50% of backwash wastewater compared to conventional backwash methods.

Instrumentation and controls consist of a Tonka PLC-based NEMA 4 automatic control panel, which automatically backwashes the filters based on high turbidity, loss of head, timer or operator initiation. The duration of the backwash is adjustable by the operator through an Allen-Bradley PanelView 1000 color touchscreen OIT.

**PERFORMANCE**

The inlet water to the UTS-P, summarized below, is the effluent of a conventional activated sludge process final clarifier. The Tonka UTS-P treatment process has been highly efficient in meeting the effluent water quality required by NPDES permit.

	<u>Inlet</u>	<u>Effluent</u>
Phosphorous mg/L	0.25 mg/l	0.016 mg/l

**FOR ADDITIONAL DETAILS, CONTACT:**

Tonka Equipment Company

<sup>1</sup>Amirtharajah, Appiah, et al. *Optimum Backwash of Dual Media Filters and GAC Filter-Adsorbers With Air Scour*, AWWA Research Foundation and American Water Works Association, 1991.



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