



TONKA EQUIPMENT COMPANY

Project Profile

ADVANCED TECHNOLOGY PARK Barnwell, SC

Bamberg Utility Board

Contact: Bruce Ellis/Cal Hartzog
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DESIGN ENGINEER

Hussey, Gay, Bell & Deyoung, Inc.
(843) 849-7500

TONKA REPRESENTATIVE

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APPLICATION:

Iron removal and water stabilization
Flow: 1000 gpm

TONKA PROCESS EQUIPMENT:

The plant incorporates:

- Tonka Dualator® VI treatment plant
- Silica sand/anthracite dual media
- Tonka's Simul-Wash™ backwash system

PROJECT

The Tri County Alliance, an economic development board, was promoting a new Advanced Technology Business Park at a former DOE facility. Infrastructure improvements were required to attract new businesses. The existing wells had elevated levels of iron and were very aggressive in nature with extremely low pH and alkalinity. The consulting firm of Hussey, Gay, Bell & Deyoung was hired to design and administer the construction of a new treatment plant to eliminate the iron as well as stabilize the water supply. The Engineer worked with Tonka Equipment Company to pilot and design South Carolina's first Dualator® VI treatment plant.

PROCESS

The 1,000 gpm treatment process consists of three steps in one compact system— aeration, detention and filtration. The aeration step is for gas stripping and iron oxidation. Due to the low pH and alkalinity, the raw water is very aggressive, so lime and sodium bicarbonate are added after aeration for water stabilization. The detention tank allows full oxidation of the iron and ensures complete chemical reactions take place prior to filtration. The final step is filtration through a four-cell filter system using a dual-media filter bed of silica sand and anthracite. The anthracite cap serves to capture the larger iron particles and precipitates, while the silica sand removes the smaller solids that pass through the anthracite.

The Dualator® VI treatment plant 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.¹ Tonka's media-rejecting Simul-Wash™ trough enables 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 methods. The system is controlled by Tonka's PLC-based automatic control panel with an interface touch pad.

Another benefit of the Dualator® VI treatment plant is that it requires no additional water source for backwash supply. When a backwash is called for, the Tonka PLC “locks on” the well pump and automatically cycles the valves to isolate one of the four filter cells. This allows three of the four cells to remain “online” providing the required backwash flow rate for the fourth cell. Once this cell completes its backwash, the PLC sequentially cleans the other remaining cells in the same manner.

PERFORMANCE

The raw water analysis below reflects a very aggressive water with iron that is above the MCL. Since start-up, the treatment process has been highly effective in delivering quality water as indicated below.

	Raw Water	Finished Water
Iron (Fe)	0.35 mg/l	0.01 mg/l
pH	4.3	7.2
Alkalinity	1 mg/l	42 mg/l

FOR ADDITIONAL DETAILS, CONTACT:

Tonka Equipment Company

¹Amirtharajah, 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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