



TONKA EQUIPMENT COMPANY

Project Profile

City of South Bend, IN Pinhook Water Treatment Plant

CITY OF SOUTH BEND

Contact: John Wilttrout
Director of Public Works
(574) 235-5670

DESIGN ENGINEER

Cole Associates
Contact: Mark Nye
(574) 236-4400

TONKA REPRESENTATIVE

Gasvoda & Associates, Inc
Contact: Trey Hardesty
(708) 891-4400



APPLICATION:

Iron and Manganese Removal

TONKA PROCESS EQUIPMENT:

Components for renovation of existing filters consisting of:

Inlet distribution boxes, underdrains, filter media, Simul-Wash™ system, automatic backwash controls and internals for existing aeration equipment.

PROJECT BACKGROUND

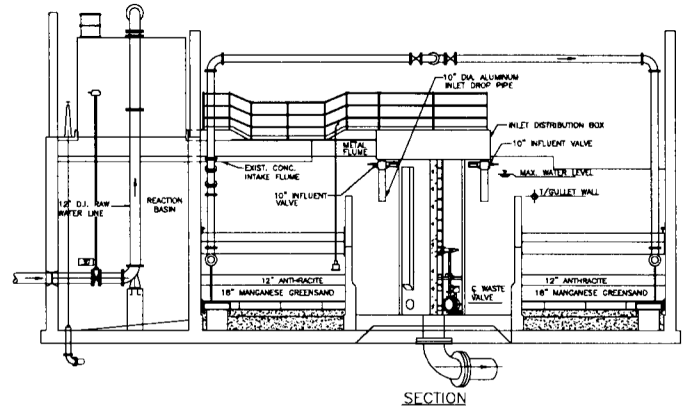
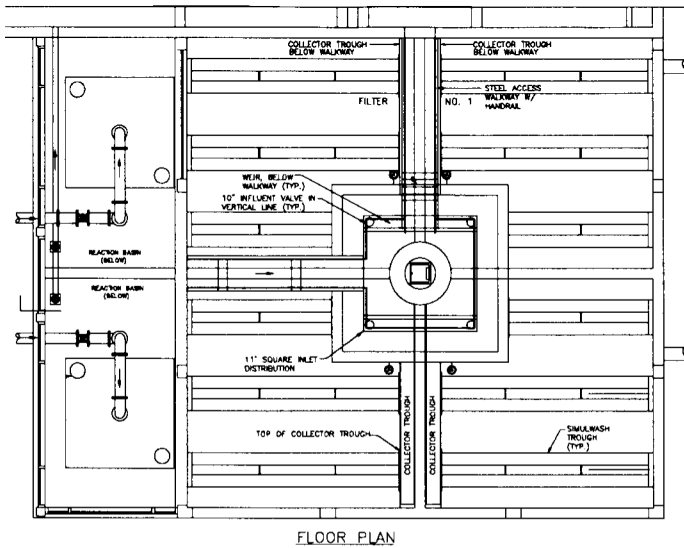
The existing Pinhook water treatment plant, built in 1967, had a capacity of approximately 12 mgd but did not include any current day technology. The existing process consisted of aeration, chemical injection and filtration. The city elected to upgrade the facility with the intent of bringing the facility up to current day design standards which would improve plant operation, overall performance and efficiency. The existing facility presented some unique design challenges in that the filter cell depth was considerably shallower than typical filters of the same design. Tonka worked very closely with Cole Associates during the design phase of the project, assisting in overcoming this and many other design challenges.

EQUIPMENT

The renovation project was very extensive. All of the existing equipment was removed from the existing filters with the exception of the filter center columns. The center columns were then modified with new externally mounted backwash waste valves. New inlet distribution boxes were provided and mounted on the existing filter walls over the center column; new low profile underdrains incorporating airwash distributors were installed in each of the filter cells; Tonka's Simul-Wash™, simultaneous air and water backwash system, was installed for backwash waste conservation; the filters were provided with a dual media filter bed consisting of manganese greensand and anthracite; and new automatic filter backwash controls were provided. In addition to the filter modifications Tonka also provided new internals for the two existing Induced Draft Aerators.

PROCESS

Raw water for the plant is provided by several wells operated in various combinations. The raw water is pumped to the treatment plant where it is first aerated. Following aeration chlorine and potassium permanganate are fed before the flow drops into a detention tank. The chemically treated flow is then routed to the inlet distribution boxes where the flow is evenly split among the respective cells of the filter clusters. The water is filtered through the dual media and is collected by the underdrain system and routed to the clearwell where high service pumps pick up the flow and pump it to the system.



The incorporation of the value-added Simul-Wash™ backwash process assures a superior cleaning of the filter media. This unique process uses air and water in combination, at sub-fluidization water rates, providing the most effective means of backwashing granular media filters.¹ The Tonka Simul-Wash™ media rejection backwash trough was integrated into the filter design, which enables the air and water backwash cycle to continue for a limitless period of time without media loss. This process features optimal filter cleaning efficiency with approximately 50% reduction in backwash wastewater volume over conventional methods. The Tonka Simul-Wash™ process also provides the longest filter runs possible meeting the highest standards of water filtration.

PERFORMANCE

The raw water iron and manganese is being reduced to levels well below the secondary standards to near non-detectable levels.

FEATURES OF THE TONKA SYSTEM

PROVEN	Capability to assist in design and provide custom designed equipment for existing treatment facilities Tonka's ability to take on complete system responsibility
SIMUL-WASH™	Maximizes bed cleaning resulting in longer runs and fewer backwashes Minimizes backwash waste
TROUGH DESIGN	Maximizes media retention without infringing on solids removal True overflow design

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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763-55-WATER • 763-559-2837 • FAX: 763-559-1979 • www.tonkawater.com
P.O. BOX 41126 • PLYMOUTH, MINNESOTA 55441-0126 • 13305 WATERTOWER CIRCLE • PLYMOUTH, MINNESOTA 55441