TONKA EQUIPMENT COMPANY

Project Profile

LANGHAM, SK WATER TREATMENT PLANT

WATER TREATMENT PLANT
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APPLICATION:

- Iron, Manganese, Hardness, and Sulfate Removal
- Design flow is 230 gpm

TONKA PROCESS EQUIPMENT:

- Forced Draft Aerator
- Vertical Pressure Filters
- Nanofiltration Membrane System

PROJECT

Langham is a community of approximately 1,400 people located 30 kilometers northwest of Saskatoon. Over the past 10 years, the town has been developing a strategy to replace their existing 40-year old wells, and upgrade the treatment plant for the local population and for newcomers relocating from Saskatoon.

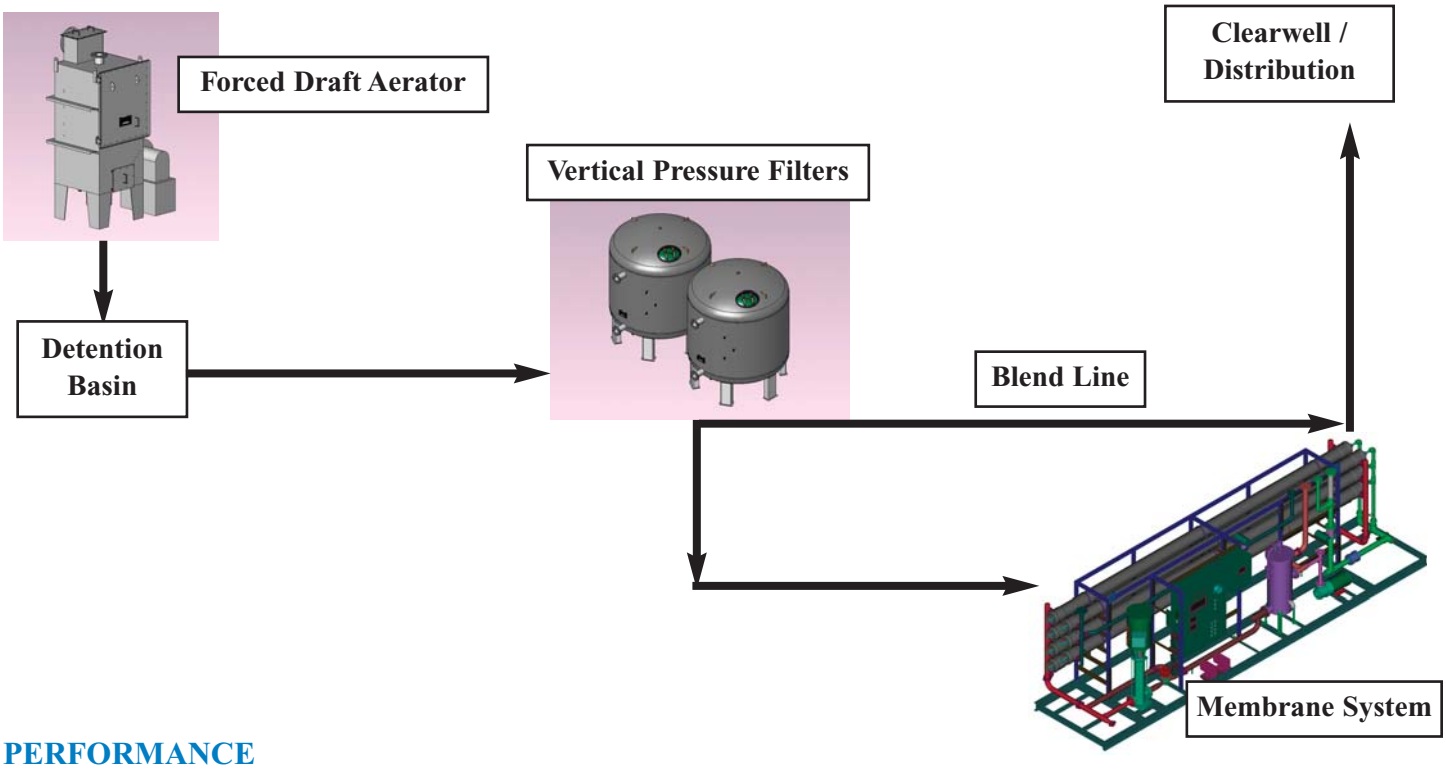
In 2002 the town secured the necessary funding and enlisted the services of Associated Engineering Ltd. to design a new water treatment plant to better serve the community's needs. Like many groundwater sources in Saskatchewan, Langham's well supply contains iron and manganese in excess of guidelines recommended by Saskatchewan Environment. In addition, the hardness and sulfate concentrations also exceed the guidelines. Langham's old plant targeted the iron and manganese removal; however, high levels of hardness and sulfate remained in the water distributed to the community. With this in mind, the new plant was designed to remove iron, manganese, hardness and sulfate. The most efficient treatment process addressing these constituents requires a multi-pronged approach.

PROCESS

The overall treatment process is an integrated system consisting of forced draft aeration, chemical addition, detention, pressure filtration, and nanofiltration. Tonka supplied the three major pieces of treatment equipment at the Langham plant including the forced draft aerator, pressure filters, and nanofiltration unit, along with a treatment process guarantee. By having a single supplier guaranteeing the treatment process, Langham operators were confident that their new water treatment plant would operate as expected.

The treatment process begins by pumping well water to the forced draft aerator where the water is atomized through spray-cone nozzles to facilitate air/water contact to oxidize the iron. Following aeration, potassium permanganate is added to oxidize the manganese present in the raw water. The water then flows to the detention basin where the oxidation reactions complete, forming the iron and manganese into filterable particles. The water is then pumped through pressure filters to remove the iron and manganese particles before flowing to the nanofiltration membrane unit. A portion of the full flow rate is bypassed around the nanofiltration membrane unit, and blended with the water treated by the unit. The proportion of water bypassed around the membrane can be adjusted to achieve the desired hardness concentration in the finished water.

TREATMENT PROCESS SCHEMATIC



PERFORMANCE

The treatment process has been highly effective in delivering quality water in compliance with Saskatchewan Environment guidelines. The results are listed below.

Constituent	Raw Water	Finished Water
Iron (as Fe)	2.1 mg/l	<0.3 mg/l
Manganese (as Mn)	0.77 mg/l	<0.05 mg/l
Total Hardness (as CaCO3)	756 mg/l	blended to 100 mg/l
Sulfate (as SO4)	394 mg/l	blended to 58 mg/l

FOR ADDITIONAL DETAILS, CONTACT:

Tonka Equipment Company

www.tonkawater.com

TONKA WATER TREATMENT SYSTEMS

TONKA EQUIPMENT COMPANY

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