

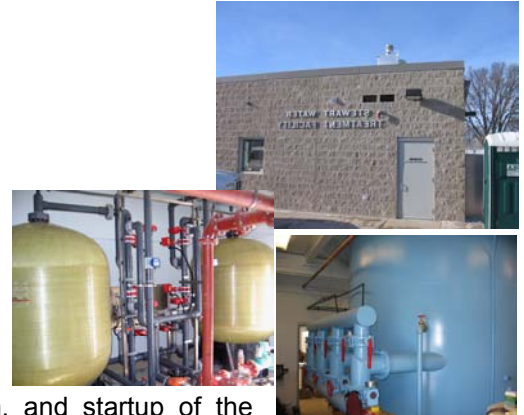
Project Profile



USEPA Arsenic Demonstration Project Stewart, Minnesota Arsenic and Iron Treatment System

Background

AdEdge Technologies Inc. (AdEdge) was selected in 2004 by the U.S. EPA as part of the Round 2 Arsenic Demonstration Program to implement full scale arsenic treatment for the city of Stewart, Minnesota. This public water system serves a community of approximately 600 people with average daily demand of 60,000 gallons per day. AdEdge was selected from the proposed alternatives by the host site and contracted by U.S.EPA to perform a turnkey project including design, fabrication, permitting, installation, and startup of the treatment facility. The site received some supplementary grant money from USDA for additional infrastructure, electrical, chemical upgrades and a new treatment building. The AdEdge team including Bolton & Menk Engineers and KHC Construction prepared the design documents and obtained all regulatory permits from the Minnesota Department of Health (MDH) to install a two-stage treatment system to reduce the high iron, manganese, and arsenic levels to below the new standards from the two wells serving the site. The system utilizes AdEdge's granular ferric oxide (GFO) adsorption system using Bayoxide E33®. Building and system upgrades were also performed prior to arrival of the equipment. The system was installed and placed into full time operation in January, 2006.



Treatment System

The AdEdge arsenic treatment train consists of a completely integrated packaged treatment system with two main modules designed for 250 gallons per minute (gpm): an Aeralator iron and manganese filtration unit and an Adsorption Package Unit (APU) for arsenic removal. The systems are integrated into the overall control scheme through a supervisory control panel, PLC, and chemical feed systems. The first module in the treatment train is the iron/manganese removal system, which consists of a three-compartment aeration, detention tank and filtration unit that utilizes a continuous sodium permanganate feed. The second component is an arsenic adsorption skid-mounted unit rated for 250 gpm configured in parallel operation. Raw water is pumped from the two groundwater-supply wells through the iron filter and then subsequently through the APU adsorption system before entering the distribution. The 5-foot diameter APU vessels each contain Bayoxide E33® adsorption media. Bayoxide E33® also known as GFO has been in commercial use since 1999. AdEdge has used GFO media in over 50 small community and non-community public water system applications and in over 2,000 residential applications throughout the U.S. and Canada.

Total As **	0.040	mg/L As
As(III)	0.039	mg/L
Alkalinity	420	mg/L @ CaCO3
Hardness **	240	mg/L @ CaCO3
Silica **	28.0	mg/L SiO2
Phosphate **	<0.05	mg/L P04
TOC	6.0	mg/L TOC
Iron **	1.2-1.5	mg/L Fe
Manganese **	0.03	mg/L Mn

Performance

The integrated systems are equipped with various controls, backwashing features, switches, gauges, flow meters, and sample ports for complete functioning packaged units. A PLC and color touch screen interface allow for simple user access and operation. The system was commissioned in January, 2006 treating approximately 60,000 gpd. Early results indicate excellent removal of iron from 1.4 mg/L to <0.05 mg/L, manganese to < 0.02 mg/L, and arsenic removal from 40 parts per billion (ppb) to below detection, less than 2 ppb.

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