

Project Profile

Arsenic Treatment-Michigan



Background

In May, 2003, upon approval by the County Health Department, Adedge Technologies in conjunction with its Michigan representative Artesian, Inc. installed the first arsenic treatment system for a Type II non-transient, non-community (NTNC) water system in Oakland County, Michigan. The 40 gallon per minute (gpm) system was installed at an elementary school serving 600 students to reduce naturally occurring arsenic to meet the new EPA maximum contaminant level (MCL) of 10 parts per billion (ppb). Historically, arsenic levels reported in the well serving the school ranged from 30-55 ppb, 3 to 5 times higher than the new standard. Prior to initiating treatment, a complete water profile was obtained on the source water to properly prescribe the solution and size the treatment system. Analytical parameters included arsenic, pH, iron, manganese, hardness, alkalinity and others. The pH of the water averaged 7.6. Iron was present in the feed water at 0.5 mg/L and average hardness as 228 mg/L as CaCO₃.

pH **	7.60	
Total As **	0.031	mg/L As
As(III)		mg/L
Alkalinity	240	mg/L @ CaCO ₃
Hardness **	228	mg/L @ CaCO ₃
Silica **	15.6	mg/L SiO ₂
Phosphate **	NA	mg/L P ₀₄
Sulfate **	7.0	mg/L SO ₄
Iron **	0.50	mg/L Fe
Manganese **	< 0.05	mg/L Mn



Clarkston, Michigan Arsenic Treatment System installed May, 2003

System Description

Adedge implemented an integrated treatment approach utilizing granular ferric oxide adsorption technology within a packaged treatment system. Given the limited space available, a modified Adedge Adsorption Package Unit (APU-40) treatment system was installed. The small footprint system features a twin vessel configuration with automatic controls, containing an innovative, high capacity media referred to as Bayoxide E/AD33. The media efficiently removes the arsenic through chemical adsorption as the water passes through the bed. Preceding the adsorption system, a single stage water conditioner was installed to pre-treat for hardness and iron for optimal performance and final water quality. The system was installed in-line after the pressure storage tank supplied by the well. The Adedge adsorption system requires no chemicals, regeneration, and does not generate liquid or hazardous waste. Media is discarded as a non-hazardous solid waste when exhausted. Minimal operation, maintenance, or operator attention is required for this simple automated system. Instrumentation is provided to measure critical operating parameters. Total gallon throughput and flow rate is measured continuously with a flow meter.

Performance

Samples were obtained of the influent and effluent from designated sample ports following startup of the system. The most recent influent concentration of arsenic was 31 ppb. An ongoing sampling program for periodic performance sampling has also been initiated. To date, all samples from the effluent of the system have been shown to be below the detection limit of 3 ppb arsenic. Based on the site specific water profile and usage patterns, the system is expected to operate for more than 2 years before media replacement.

For More Information Contact

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