Company Overview



Founded in 2002 and headquartered just north of Atlanta, Georgia, AdEdge Water Technologies specializes in the design, development, fabrication and supply of water treatment solutions, specialty medias, legacy and innovative technologies that remove a wide range of contaminants from water. Our management team has more than 300 combined years of experience in the water treatment industry.

Our mode of work and technologies allow our customers to understand how to manage the elements in a variety of industries with outstanding results. These industries include drinking water, industrial process, mining, dewatering, construction, chemical, remediation and general tertiary wastewater treatment.

We have extensive experience in the removal of arsenic, iron, manganese, hydrogen sulfide, fluoride, nitrate and uranium from water, and we've sold hundreds of water systems ranging from 5 gpm to over 20 MGD in the country and around the world including Canada, India and countries in Africa and Latin America.

We recently expanded our engineering and manufacturing capabilities to design and build all systems in our manufacturing facility. To date the U.S. Environmental Protection Agency (EPA) has awarded us 12 arsenic demonstration projects, more than any company in the industry. We work with 75% of the top 12 design firms in the United States and hundreds of engineering firms globally.



MODULAR TREATMENT SYSTEMS



ULTRA-HIGH RECOVERY FLOW REVERSAL RO

Our Solutions



ADEDGE PACKAGED UNITS (APU)



WATERPOD CONTAINERIZED SYSTEMS



LARGE MODULAR TREATMENT SYSTEMS

biottta[®] BIOLOGICAL TREATMENT

Project Installations by Contaminant

Contaminant	Number of Installations	
Arsenic	400 + systems	
Iron & Manganese	350 + systems	
Radionuclides	60 + systems	
Color, Odor, TDS	30 + systems	
Nitrate	10 + systems	

Corporate Capabilities



Manufacturing

AdEdge's manufacturing capbilities encompass mechanical assembly and testing and a panel shop for full electrical assembly and testing.

- Design and fabrication of WaterPOD treatment systems
- Design and fabrication of treatment systems, controls, control panels
- Design and fabrication of pump skids, recycle backwash systems, chemical feed
- Assembly of piping for PVC and stainless steel systems
- Assmebly of valves, vessels, piping, and instrumentation into skidded systems
- Assembly of PLC-driven and relay-driven electrical panels using UL listed components

Engineering

AdEdge's engineering capabilities make use of sound, proven principles for the hydraulic, mechanical, and electrical design of our treatment systems.

- Process Engineering: PID, PFD
- Mechanical design using 3D modeling
- Steel frame design, piping design
- Electrical control and instrumentation design
- Ladder logic design
- HMI programming

Quality Assurance and Quality Control

When AdEdge is awarded a project, a Project Manager is selected by the Director of Operations to handle the development of the project as we are committed to providing a quality product for our customers. A strict set of procedures is followed diligently to ensure our manufacturing process goes smoothly once given the release to fabrication. AdEdge's engineering QA/QC process involves several steps by key team members in ensuring the design approach is in line with the project requirements, and consequently that the finished product is in line with the design approach. The steps include:

- Project Kickoff Meeting
- Submittals Preparation
- Submittal Review Meeting
- Manufacturing Kickoff Meeting
- Manufacturing
- Consistency Review
- Manufacturing Quality Control







INTEGRATED WATER SYSTEM SOLUTIONS

AdEdge Package Units & Modular Systems For Arsenic Reduction

Compliance with the United States EPA and the World Health Organization's maximum contaminant level of 10 parts per billion for arsenic impacts thousands of water systems throughout the United States and other countries around the globe.

The dangers of arsenic are masked by its colorless, odorless appearance. It is a carcinogen that occurs naturally in groundwater and is known for leading to dangerous health conditions such as cancer, neurodevelopmental disorders, and heart failure.

AdEdge offers multiple water treatment solutions rated from 5 gpm to over 12 MGD to meet your treatment needs. Choosing the right option is variable upon flow rates, arsenic concentration, the presence of co-contaminants, and site specific conditions or limitations. Upon receiving a complete water quality analysis, AdEdge determines the best treatment option suitable to your needs based on years of experience and an accurate predictive model.

These options include:

- Adsorption using Bayoxide E33 granular ferric oxide media
- Coagulation/Filtration with iron augmentation
- Oxidation/Filtration

AdEdge's line of packaged, pre-engineered AdEdge Package Unit (APU) systems are the ideal solution for public water systems, schools, subdivisions, and more. We also have a line of modular treatment systems that arrive to site unassembled, ready for installation upon arrival. These solutions can incorporate the adsorption, oxidation/ filtration, and/or coagulation/filtration treatment processes with pre-and-post treatment for a complete integrated system.



2.7 MGD arsenic removal system in Santiago, Chile using AdEdge's Bayoxide E33 adsorption media.

WHY CHOOSE ADEDGE FOR YOUR ARSENIC REMOVAL NEEDS

- AdEdge participated in 12 successful USEPA arsenic demonstration projects.
- AdEdge has over 400 arsenic treatment systems throughout the world.
- AdEdge offers a range of treatment options to meet your treatment needs and goals.
- Independent studies have proven AdEdge's E33 adsorption media to be the highest performing technology for arsenic removal.
- All treatment technologies are NSF 61 certified.

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ARSENIC REDUCTION

DATA SHEET



FEATURES & BENEFITS OF ADEDGE ARSENIC REMOVAL SOLUTIONS

- Removal of up to 99% of total arsenic in water, including As (III) & As (V), with no wasting of water
- NSF 61 product listing (see AdEdge for listing site/ product details)
- Effective over broad water chemistry
- Spent media discarded as non-hazardous solid waste
- Simple commercial applications for arsenic removal
- Reliable performance and low maintenance
- Adaptable add-on to water softening or other existing equipment

ADSORPTION

In the adsorption process, contaminants break their bond with water molecules and chemically adhere to a filter media. This is accomplished by directing water flow through pressure vessels that contain the adsorptive media, at a specific rate that allows optimal contact time for adsorption



to occur. AdEdge Water Technologies' Bayoxide E33 adsorption media is the industry standard for arsenic removal. This granular ferric oxide media reduces up to 99 percent total arsenic, including arsenic (III) and arsenic (V).

OXIDATION/FILTRATION

Oxidation/filtration is a precipitative process that removes naturally occurring arsenic — if it coexists with appropriate levels of iron — iron, manganese and hydrogen sulfides from water. The process oxidizes the insoluble forms of these contaminants into their soluble forms and then removes them via filtration. Oxidation/filtration media has a high catalytic and oxidation capacity, superior handling properties, NSF 61-certification, does not require permanganate or coagulant addition, and has low operating and capital costs.

COAGULATION/FILTRATION

Coagulation/filtration is a process that introduces a coagulant, typically an iron or aluminum salt, to pretreat water contaminated with arsenic, iron, manganese and/or sulfides. The process allows for higher flow rates per square foot of media, creates less backwash water than other conventional treatment

approaches, and has a smaller footprint that allows for lower operating and capital costs. This process involves a chemical addition, automated processes, which decreases operator involvement and expense, and does not generate hazardous waste.



Arsenic Experience



OUR EXPERIENCE

Since our founding in 2002, AdEdge Water Technologies has successfully installed over 450 arsenic removal treatment solutions around the United States employing a variety of technologies, including adsorption using Bayoxide® E33, coagulation/filtration, oxidation/filtration, and reverse osmosis. The map below depicts the number of arsenic treatment systems installed in each state in the United States.



 LEGEND

 > 50 PROJECTS
 40 - 49 PROJECTS
 30 - 39 PROJECTS
 20 - 29 PROJECTS

 10 - 19 PROJECTS
 < 10 PROJECTS</td>
 NO DATA

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EPA Project List



AdEdge Water Technologies, LLC. was selected by USEPA through an expert peer review process in cooperation with the individual host sites to conduct full scale arsenic treatment demonstrations using its Granular Ferric Oxide adsorption and AD26 oxidation/filtration technologies. The program gathers extensive cost and performance data on commercially available, proven technologies which are candidates to become Best Available Technology (BAT) for arsenic removal. AdEdge was awarded the following 12 projects treating individual or multiple wells ranging from 20 to 300 gpm.

Site/Location	Media	Flow Rate
Rimrock, Arizona	E33	40 gpm
Rollinsford, New Hampshire	E33	160 gpm
Nambe Pueblo, New Mexico	E33	160 gpm
Goffstown, New Hampshire	E33	20 gpm
Springfield, Ohio	AD26/E33	250 gpm
Stewart, Minnesota	E33	300 gpm
Bruni, Texas	E33	50 gpm
Wellman, Texas	E33	100 gpm
Sells, Arizona	E33	100 gpm
Geneseo Hills, Illinois	AD26/E33	200 gpm
Clinton Christian School, Indiana	AD26/E33	25 gpm
Conneaut Lake Park, Pennsylvania	AD26	250 gpm



WaterPOD units help reduce arsenic levels for Nevada utility

How an integrated treatment system solved Spring Creek's dilemma

PROJECT

After discovering its three wells contained excessive levels of arsenic, the Spring Creek Utilities Co. hired Sunrise Eng. to help develop a solution. The engineering firm contracted with AdEdge Water Technologies in June 2011 after a competitive bidding process, to design, manufacture and start up an arsenic treatment solution as quickly and economically as possible.

The Spring Creek Utilities Co. provides water service to 1,500 residents in Spring Creek, Nev., outside the city of Elko, Nev., in a sparsely populated northeast portion of the state. Its water system consists of three wells that feed into a centralized distribution system: Well #1 receives water at a maximum flow of 435 gpm, well #3 at a maximum flow of 725 gpm and well #11 at a maximum flow of 720 gpm, for a combined maximum capacity of 1,950 gpm, or 2.8 mgd.

The water in these wells were found to have average arsenic levels ranging from 19 ppb to 35 ppb, well in excess of the Nevada Division of Environmental Protection's (NDEP) maximum contaminant level of 10 ppb. The U.S. Environmental Protection Agency (EPA) and NDEP had ordered Spring Creek to address this problem within six months.

"There was no time to design and construct a conventional facility," said Greg Gilles, vice president and principal of AdEdge. "One of the things that helped them to select us was our experience with arsenic treatment, and that we could deliver the system in the timeframe they needed."



AdEdge Water Technologies, LLC provided five WaterPOD units for the three water wells at Spring Creek Utilities Co.

STATS

Customer: Spring Creek Utilities Co. Location: Spring Creek, Nevada Challenge: Reduce high arsenic levels in three water wells

Flow Rate: 1,950 gpm (2.8 mgd) Products:

- Custom-designed WaterPOD containerized units
- H2Zero backwash
 reclamation system

Results: Since startup in December 2011, arsenic levels in all wells have been reduced to fewer than 2 ppb.

For more information on these solutions, visit adedgetech.com.

CASE STUDY

SOLUTION

AdEdge provided five 40-ft.-long WaterPOD containerized units: one custom-designed unit for well #1, and two each for wells #3 and #11. Each unit includes HVAC, pedestrian doors, vents, windows and lighting—and, most importantly, an AdEdge GS+ coagulation/ filtration package that is sized for the well's maximum flow. These units sit on concrete slab bases and are pre-designed and prepiped, ready for "plug and play" use.

"Being able to have something that just rolls off a truck, you plug and play and it's ready to roll, saved a lot of time for us," said Kevin Brown, civil engineering manager on the project for Sunrise Eng.

The treatment process begins in the well house, where a chlorine module injects liquid sodium hypochlorite into the water. This oxidizes arsenic (III) to arsenic (V) to aid in its removal. The water is then injected with ferric chloride to supplement the raw water iron concentration in order to further assist in arsenic removal. From there, the water is treated with CO₂ to



Since December 2011, arsenic levels in water from all three wells have been reduced to below the maximum contaminant level.



Each WaterPOD contains an AdEdge GS+ coagulation/filtration package sized for the well's maximum combined flow of 1,950 gpm.

reduce its pH level to approximately 7, as adsorbent media and coagulation/filtration processes are typically more effective in waters with pH levels of 6.8 to 7.3.

After pH level is reduced, the water is introduced to the WaterPOD and treated using 26 cu ft of AdEdge GS+ coagulation/ filtration media, housed in carbon-steel vessels (seven at well #1's WaterPOD, and six each at the other two wells) in a parallel configuration. AdEdge GS+ is an NSF 61-certified black filter media used for arsenic, iron and manganese removal. Its surface is coated with manganese dioxide, which acts as a catalyst in the oxidation-reduction reaction of iron, arsenic and manganese. The treated water is then stored in an atmospheric tank.

Each system features automated control valves and harnesses, a central control panel with a programmable logic controller (PLC) and a color user interface screen. They also include differential pressure systems; control panel with local gauges, flow sensors and totalizers; and central hydraulic panel with sample ports.

The facility backwashes these systems every two to three days in order to remove any suspended solids that accumulate in the bed and to hydraulically fluff the bed to prevent channeling. AdEdge also provided an H2Zero backwash reclamation system that reclaims 99.8% of the settled backwash water. The settled suspended solids form a low-percentsolids sludge that can be dewatered and removed to a solid waste landfill.

RESULTS

The systems started up in December 2011, with all three wells feeding into an overall integrated treatment system that manages the maximum capacity of 1,950 gpm. "It was easy to get the site ready and get the technology up and running. From an engineer's standpoint, it couldn't have been any better," said Brown.

Since this treatment process was initiated, the arsenic levels in water from all three wells have been reduced to fewer than two ppb—far below the NDEP's maximum contaminant level.



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Adsorption Technology Helps Reduce Arsenic at Chilean Drinking Water Facility

Contract awarded to help Aguas Andinas bring arsenic levels into compliance with new national standard

PROJECT

In 2005, Chile's Superintendence of Sanitary Services implemented a new arsenic standard for drinking water, giving the country's water treatment companies 10 years to accomplish it. Many of the companies, which are privately held, sought solutions for their arsenic issues and help coming into compliance with the new standard. Aguas Andinas, the largest water company in Chile with a customer base of more than 20,000 people, was one of them, putting out a solicitation for technology innovators to provide turnkey proposals for its Lo Pinto well site in the Santiago metropolitan area.

At Lo Pinto, the water in the three wells was found to have average arsenic levels ranging from 15 ppb to 21 ppb, well in excess of Chile's new maximum contaminant level. "The arsenic standard in Chile is now the same as in the United States at 10 ppb, but they have a shorter compliance period to bring their wells into compliance. There are a number of similarities to where Chile is today from the U.S. situation in 2001, when the U.S. Environmental Protection Agency (EPA) first promulgated the lower arsenic standard," said Greg Gilles, vice president and principal at AdEdge Water Technologies, LLC.

In 2012, AdEdge began a strategic partnership with Aqualogy Mediamente, which is now part of Suez Environnment, to assist Chilean water companies with solutions to these and other water quality issues. Together with the strong local presence of Aqualogy and its own expertise in arsenic treatment, AdEdge was awarded the contract to provide treatment system design, equipment, installation and startup for Aguas Andinas at Lo Pinto.

STATS

Customer: Aguas Andinas Location: Lo Pinto, Chile Challenge: Reduce high arsenic levels in three water wells

Flow Rate: 1,900 gpm

Product: Custom-designed seven-vessel treatment system

Results: Since startup in Q1 2015, the arsenic levels in all three wells have been reduced to less than 1 ppb, far below Chile's maximum level of 10 ppb.

For more information on these solutions, visit adedgetech.com.



A seven-vessel parallel flow design by AdEdge Water Technologies, LLC was installed at this site in Lo Pinto, Chile.

CASE STUDY

SOLUTION

A seven-vessel parallel flow design, comprising six vessels in service and one redundant vessel, was designed and deployed with carbon steel construction. At the three wells, the 1,900-gpm system begins by adding chlorine for disinfection and oxidation of the arsenic before the water reaches the treatment facility. Acid also is added to lower the pH from more than 8.0 to around 7.0, and to make the water more optimal for arsenic removal.

The water then passes through an inline mixer and below-grade piping underground. Once it reaches the treatment facility, it splits evenly into the seven skid-mounted filters designed by AdEdge. Within the filters, arsenic is removed using Bayoxide E33 iron oxide adsorption media. After passing through the absorption media, the water exits into a 1-milion-gallon atmospheric storage tank, where it is then re-pressurized through additional pumps and moved to Aguas Andinas' customers throughout Santiago.



The custom-designed system at the Lo Pinto site has a flow of 1,900 gpm. Since startup, arsenic levels have been reduced to less than 1 ppb.



Arsenic is removed from the skid-mounted AdEdge filters using iron oxide adsorption media.

The treatment system also has an H2Zero automated backwash reclaim that captures the backwash water used to flush out the media and filters, and recycles back to the head of the treatment every 30 to 45 days. This ensures there is no wastewater discharge at the site.

The treatment system was pre-piped, instrumented and tested at AdEdge's Atlanta facility, Gilles said, and flown into the site at Lo Pinto. The system has full programmable logic controls, automated valves and a touch-screen control panel to help operators understand the system's flows, pressures and chemical dosing. Maintenance-wise, aside from checking the system regularly to ensure everything is functioning properly, operators will need to check and replenish chemicals once they are exhausted, and take a water sample to be analyzed on a monthly basis.

Once the adsorption media has been exhausted, AdEdge will provide a service to put in new media and dispose of the existing media. The adsorption media is projected to have a lifespan of between 12 and 18 months.

RESULTS

The system started up in March 2015,

and Aguas Andinas is increasing its use of the system on a weekly basis.

"They had an initial low demand, but now that is increasing over time because more wells are being brought online in the system. Some of these wells exhibited an arsenic problem above the standard, requiring treatment while others did not. But they all can operate as an integrated system now," Gilles said.

"The system has worked without any problems and meets Aguas Andinas' expections," said Simón Vargas of Aqualogy Mediamente. "The system works completely as designed."

Since this treatment was initiated, the arsenic levels in water from all three wells have been reduced to less than 1 ppb—far below the maximum contaminant level. It is one of the first adsorption installations in Chile of this type.



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AdEdge USEPA Arsenic Demonstration Project in Illinois

Community in Illinois sought a solution to treat high levels of arsenic in groundwater

PROJECT

AdEdge Water Technologies, LLC (AdEdge) was selected in 2007 by the U.S. EPA and the host site in Round 2a Arsenic Demonstration Program to implement a turnkey arsenic treatment for the Geneseo Hills Community in Geneseo, II. The Geneseo Hills water system is served by one well with a design flow of 200 gpm, with a backup well. The well provides potable water for a community with 190 connections and a population of approximately 480 residents. The treatment system receives water on the demand side of the storage tanks with an arsenic level of 25 ppb, above the EPA MCL of 10 ppb. From the combined 21,000 gallon twin pressurized storage tanks, water is treated by AdEdge system which is configured in parallel. AdEdge was contracted by U.S. EPA to provide and manage all permitting with IEPA, design, fabrication, installation, and startup activities. The system was Adedge's 11th full scale EPA demonstration project.

SOLUTION

AdEdge proposed and installed an APU-5460CS-S-2-AVH treatment system designed to reduce arsenic concentrations to below the new arsenic treatment standard of 10 ppb. The system utilizes adsorption technology deploying AdEdge's GFO (granular ferric oxide) media. The design also includes a 100% backwash recycle system capable of filtering particulates and reclaiming all of the periodic backwash water for treatment and use. The packaged system features twin 54-inch diameter carbon steel adsorption vessels mounted on a painted epoxy coated carbon steel skid, pre-piped and integrated. The system is placed after a pre-chlorination module for oxidation of As (III) to As (V), and is equipped with automated control valves and harness, central control panel with programmable logic controller (PLC) and a color user interface screen. The System also features a hydraulic panel with local gauges and sample ports for a complete functioning packaged unit.

RESULTS

Since full time operation began in April, 2008, the system has effectively reduced arsenic consistently below 2 ppb, well below the MCL. Approximately 30,000 gallons per day is being processed through the system on average. The site's operator performs the routine sample collection and reporting associated with the U.S. EPA's Demonstration Program requirements with quarterly reporting of the data by U.S. EPA's contractor Battelle.



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STATS

Customer: Geneseo Hills Location: Illinois Challenge: Reduce high arsenic levels Flow Rate: 100 gpm

Product: Custom-designed AdEdge Package Unit (APU)

Results: Since installation in 2004, the arsenic level has lowered from 25 ppb to below 2 ppb.

For more information on these solutions, visit adedgetech.com.



Arsenic, Iron, and Manganese Removal in Western New York

PROJECT

In late 2007, AdEdge Water Technologies was contacted by Wind-Sun Construction to design, implement, and install an arsenic, iron, and manganese treatment system for the Town of Campbell, New York. The Town of Campbell, located in Western New York, needed a treatment system for approximately 150 single family homes with a maximum design flow of 250 gpm. The existing water supply consisted of two wells feeding into a central distribution point. The arsenic level was 20 ppb, iron level was 1.5 mg/L, and the manganese level fluctuated between 0.10 - 0.15 mg/L, all above the EPA standards of 10 ppb, 0.3 mg/L, and 0.05 mg/L.

SOLUTION

The AdEdge treatment system featured a skid-mounted AD26 oxidation/filtration package unit sized for a maximum design flow rate of 250 gpm. The model AD26-4260CS-3-AVH utilizes AdEdge's NSF 61 certified AD26 manganese dioxide media for the removal of arsenic, iron, and manganese. Prior to the treatment system, sodium hypochlorite is injected into the raw water to oxidize the iron and manganese and facilitate arsenic (III) oxidation. Potassium hydroxide is also continuously fed into the raw water for pH control. The system is equipped with automated control valves and harness, a central control panel with a PLC and a color use interface screen. System features also include differential pressure switches, flow sensors and totalizers, and sample ports for a complete functioning packaged unit.

Each of the three 42-inch diameter vessels contains 28 cubic feet of AdEdge's AD26 oxidation/ filtration media. Backwashing of the treatment vessels occurs twice a week during the early morning hours and is automated by the PLC. Backwash water is flushed into a sanitary sewer for safe disposal. Once treated, the water exits the system and goes to a holding tank before being distributed to the town's end users.

RESULTS

System startup and operation began in March 2008. After the treatment system was installed, the Town of Campbell discovered a secondary problem unknown prior to the arsenic, iron, and manganese removal system was put in place. Methane gas was in the water and created complications with the treatment system. AdEdge worked diligently to resolve this issue with a local engineer to provide an aeration system to remove the methane gas from the water. Since the removal of the methane from the drinking water, the arsenic, iron, and manganese levels are non-detectable.

STATS

Customer: Town of Campbell Location: Western New York Challenge: Reduce arsenic, iron, and manganese from two wells Flow Rate: 250 gpm

Products:

- AD26 oxidation/filtration media
- AdEdge Packaged Unit (APU)

Results: Since startup in late 2008, the arsenic, iron, and manganese levels have been lowered to non-detectable levels.

For more information on these solutions, visit adedgetech.com.



AdEdge Water Technologies, LLC provided a skid-mounted arsenic, iron, and manganese removal system for Campbell.



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