



WinnerWater
SERVICES

A BATTELLE COMPANY

Safe, Economical
Water Solutions for
Mining, Oil & Gas,
Power and Industry.



Is water a drain on your bottom line? Whether you need to process large quantities of wastewater, find new sources for water-intensive industrial processes, or both, we can help.

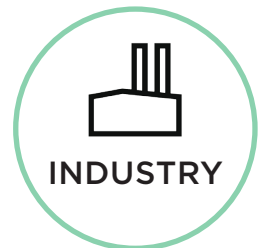
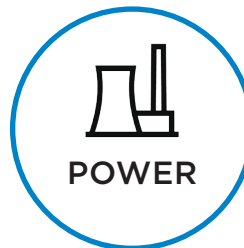
Winner Water Services provides safe and cost-effective water solutions to help our clients become more profitable and sustainable through expert technology integration and new approaches to water treatment, acquisition and reuse.

Innovative Answers for Water Treatment, Acquisition and Reuse

How? We apply advanced technology to remove contaminants such as metals, sulfates, selenium, nitrogen and phosphorus from wastewater so it can be safely reused or released. Our HydroFlex® technology helps our clients:

- Minimize fresh water consumption
- Mitigate the risks associated with storing or transporting contaminated wastewater
- Reduce the costs of acquiring and transporting water for industrial use

Our Clients





Turn Wastewater into a Usable Resource

Storing and transporting contaminated wastewater adds significant cost and risk to your operations. We can help you reduce your liabilities by cleaning contaminated water onsite for safe environmental release or reuse in other industrial applications:

- Remove both metals and sulfates in one cost-effective application
- Reduce your waste stream with an efficient, high-throughput process that can treat 100 gallons per minute
- Set up modular units right where you need them and move them when your project is complete
- Reuse water for your own applications or sell it to industries that need it
- Capture valuable extractants such as metals, nitrogen or phosphorous for reuse or resale
- Integrate secondary and tertiary treatment methodologies to meet challenging operating conditions

Find New, Sustainable Sources for Water-Intensive Applications

Hydraulic fracturing and other industrial applications use millions of gallons of water. Winner Water Services can help you find an economical and sustainable alternative to freshwater sources:

- Improve your sustainability score and reduce community conflicts over freshwater use
- Reduce water transportation costs by tapping into locally available wastewater sources
- Generate water of consistent quality for sensitive industrial applications

The HydroFlex® Advantage

Winner Water Services advanced HydroFlex technology removes metals, sulfates, selenium and other contaminants from industrial wastewater for safe reuse or environmental release. It turns potential liabilities—such as contaminated mine water or industrial wastewater—into a sustainable and economical source of water for industrial applications, including hydraulic fracturing.

Efficient Sulfate Removal

HydroFlex reduces sulfates by more than 90% without the expense and drawbacks of thermal processes or membrane technologies. It has been tested on sulfate-containing streams for several different applications and consistently meets removal targets for a range of incoming sulfate concentrations. The process conditions can easily be tuned to meet specific application demands.

Exceptional Water Recovery Rates

Membranes and thermal processes operate by concentrating the dissolved components of the feed water for removal via precipitation or as a concentrated waste stream. HydroFlex performs selective removal of sulfates, allowing for efficient recovery of the incoming feed water. More than 97% of the feed volume is able to be discharged or reused.

Low Waste Generation

HydroFlex removes sulfates and other contaminants and then recovers them in a concentrated liquid form. Fast kinetics and high recycle rates allow for production of a sodium or potassium sulfate liquid stream near solubility limits. Typically this waste stream volume is less than 5% of the feed volume.



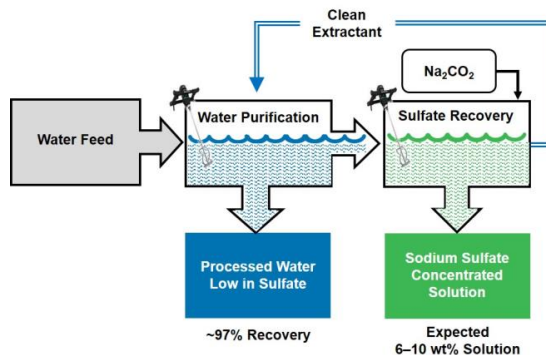
How It Works

HydroFlex is a platform technology based on well-understood solvent extraction processes. Solvent extraction has been practiced in the mining industry for decades to recover copper, uranium and other metals from leach solutions. Winner Water Services has developed proprietary solvents and a novel extraction technology that allows this safe and efficient process to be applied to wastewater processing for the first time.

The HydroFlex process encompasses two distinct stages: water purification and contaminant recovery.

- In the water purification stage, sulfates are removed from the wastewater through contact with an organic solvent that is used as an extractant. As the extractant is mixed with the contaminated water, it strips the sulfate and other anions. The anion-laden extractant is then separated from the cleaned water in a settler. The sulfate is typically reduced by about 70–90%.

- The sulfate is then stripped from the solvent in a separate extractant recovery stage. A high-pH carbonate solution exchanges sulfate with carbonate, recharging the extractant. A sodium sulfate solution with potential commercial applications is also generated within this stage.
- The process can be easily adapted to capture other kinds of contaminants by modifying the properties of the solvent.





Oil and Gas

Winner Water Services is a leader in delivering environmentally optimized, fully integrated water solutions for the oil and gas industry. Our innovative HydroFlex technology puts contaminated water from abandoned mines to good use for hydraulic fracturing operations. The mobility and flexibility of Hydroflex enables us to offer sulfate removal where you need it most.

Hydroflex provides a number of advantages for oil & gas clients:

- Provides large volumes of water of consistent quality for hydraulic fracturing and other applications
- Removes both metals and sulfates, so resulting water will not interfere with fracking chemistry
- Reduces water transportation costs by repurposing source water found near oil & gas operations
- Processes 100 gallons of water per minute
- Can be easily relocated to another location when the project is complete

Repurposing AMD for Oil & Gas Applications

Millions of gallons of water are collecting in abandoned mines throughout the Appalachian area and in western states. Left untreated, Acid Mine Drainage (AMD) from these mines can

have significant environmental and economic consequences. But with HydroFlex, abandoned mine pools can become an economical and convenient source of water for hydraulic fracturing and other operations.

Water purification and sulfate recovery has been demonstrated at two separate mine-impacted water sites in Pennsylvania. In demonstration projects at Fawn Mine in Sarver, PA, HydroFlex has been shown to reduce sulfate concentrations in AMD by up to 90%—a significant improvement over competing technologies.

The field system operation has demonstrated the ability to treat water to a variety of standards depending on the end-user requirements. The current 100 GPM HydroFlex system is made up of skid-mounted units to flexibly treat a variety of water sources while maintaining the ability to be relocated to different demonstration sites.

Mining

Contaminated water from mining operations presents tremendous environmental challenges for the industry. Winner Water Services can help. HydroFlex is a practical and economical alternative for treating sulfates and other contaminants in mine waste water.

With HydroFlex, treating contaminated mine water and Acid Mine Drainage (AMD) is a viable alternative. HydroFlex:

- Helps mining clients meet new, more stringent environmental standards regarding sulfates, selenium and nitrates
- Reduces the liability risks related to wastewater containment
- Removes sulfates and other anions so water can be safely released or even used for other industrial applications
- Processes 100 gallons of water per minute
- Can be easily moved to another location when the project is complete

Reducing the Costs and Risk of Wastewater Management

Storing or transporting contaminated water from mining operations generates significant costs and risks for mining companies. Dewatering working mines or associated impoundments may be the best approach to reducing the potential for accidental releases associated with long-term storage and containment. However, water must meet stringent environmental regulations before it can be released. The rising cost of many traditional treatment technologies has made this option economically impractical for many companies.

In order to reduce long-term liabilities and meet environmental permitting requirements, mining companies need an integrated approach to water management that is both technically feasible and cost effective. HydroFlex provides a practical, economical alternative to long-term storage and containment of contaminated mine water. Because Hydroflex can be a standalone treatment option, the system operates in the most economical way possible. It is helping mining companies meet their goals for environmental stewardship and get the most out of their water management budgets.



Power Companies

The EPA has imposed more stringent environmental regulations on coal-fired power plants. HydroFlex can be an excellent tool meet effluent limitations and help power companies ensure that they are compliant with the Clean Water Act.

The HydroFlex process is significantly less expensive than trucking wastewater away to be stored or treated. And unlike lime beds, it can also remove sulfates to discharge standards, making water safe for reuse in industrial operations or environmental release.

HydroFlex:

- Helps power companies meet new environmental regulations
- Efficiently removes metal cations as well as sulfate, selenium, phosphorous and nitrogen anions from wastewater
- Meets EPA recommendations that power plants design and operate an onsite water treatment system
- Reduces the risk of accidental releases from coal waste dumps



Industrial Manufacturing

Winner Water Services provides practical and economical water solutions for a wide variety of manufacturing industries. Whether you are looking for a viable alternative to freshwater consumption for your operations or a solution for treating wastewater created by your processes, we can help.

Winner Water Services makes manufacturing plants more sustainable and profitable by reducing reliance on freshwater sources and providing practical options for wastewater treatment. HydroFlex:

- Efficiently removes contaminants from industrial wastewater, including sulfate, selenium, phosphorous and nitrogen anions
- Meets EPA regulations for removal of sulfates and other contaminants so wastewater can be safely reused in your operations or released to the environment
- Can be installed on site permanently or moved to a different location when your project is complete



About Us

Winner Water Services provides environmentally sound and technologically advanced solutions to solve water challenges for the oil and gas, power, mining and manufacturing industries. We design effective, tailored water solutions that are backed by the power and expertise of Battelle, the largest independent research organization in the world. That means we're not just another water treatment company—we're problem solvers finding novel approaches to industry challenges.

We offer a combination of deep industry experience, scientific knowledge and proprietary technology that is unmatched in the industry. Our solutions employ Battelle HydroFlex™ technology to deliver the most cost effective, sustainable water management solutions available today. We are continuing to refine the technology and find new, innovative solutions to meet the needs of industry for today and tomorrow.

Learn more about Winner Water Services

www.winnerh2o.com



Tel: 724.981.1152 | Toll Free: 1.866.534.7377 | Fax: 724.983.5755
32 West State St. | Sharon, PA 16146