

Effective water recovery simplified through committed partnership

Endress+Hauser supplies dependable products and technical expertise for Clearas' ground-breaking ABNR system



Clearas Water Recovery is a team of engineers, innovators and problem solvers. They design, build and operate next-generation ABNR solutions to deliver high quality wastewater treatment to its partner-clients at the lowest cost of ownership. Clearas ensures partner-clients success and support in engineering, biological processes and systems management.

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Jordan Lind,
Chief Executive Officer

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Kevin McGraw,
Operations Manager & Co-Founder

Clearas Water Recovery
Missoula, MT



Clearas Water Recovery was founded in 2008 with a vision and mission to develop wastewater treatment technology, which could recover nutrients in wastewater in a biological and sustainable way. The company's patented treatment platform, Advanced Biological Nutrient Recovery (ABNR) technology, is highly modular and scalable, providing a sustainable approach to cleaning water. The Clearas system consists of three core phases: the blend phase, the nutrients recovery phase and the separation phase. For optimal results, Clearas has partnered with Endress+Hauser for dependable products and reliable technical expertise.

The challenge With increased population and rapid industrialization humanity's most vital natural resource is threatened. Streams and waterways become contaminated with excess phosphorus and nitrogen which further decreases fresh water supply. Today, there is not enough clean usable water to satisfy demand.

The implementation of cutting edge wastewater treatment technology like Clearas' ABNR system requires extreme attention to detail and exacting control of process constituents throughout. From past experience, it was clear to Clearas that they needed best-in-class instrumentation with the quality and reliability necessary to maximize the success of client operations. Endress+Hauser products were a natural fit with the outstanding longevity, dependability, and value Clearas was looking for.

"With Endress+Hauser products we knew we would only have to buy them one time. We are so excited to have Endress+Hauser engaged, now I do not need to worry about doing it all myself," says Kevin McGraw, Operations Manager & Co-Founder of Clearas.



The ABNR breakdown:

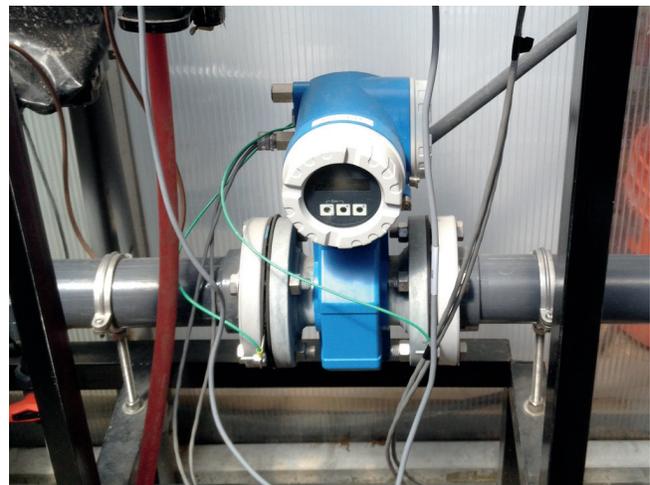
- **Blend:** Contaminated wastewater and carbon dioxide are mixed with a blend of algae and other biological organisms to create a biodiverse mixture flow.
- **Nutrient Recovery:** The mixture flow leaves the blend tank and enters the vertical pond system. This greenhouse structure and light source provide light year round for 24/7 nutrient recovery. The system optimizes biological activity and photosynthesis. Inside the algae metabolize the unwanted contaminants and rapidly divide. The dense algae culture takes over and biologically cleans the water releasing oxygen.
- **Separation:** Advanced microfiltration separates the mixture flow into two different streams: the recycle stream and the clean water stream. The recycle stream returns the healthy algae and other biological organisms back to the blend tank to start the process over again. The excess waste and algae are harvested from the treatment process. The clean water stream is now free from harmful contaminants and is released back for reuse. This is where Endress+Hauser products play their vital role.

Realization Both the Chief Executive Officer, Jordan Lind, and McGraw realized a technological change was essential for their company and Endress+Hauser was it. They needed reliable, long lasting equipment. They replaced the unreliable products with Endress+Hauser's electromagnetic flowmeters and pressure transmitters. The automated controls regulate the relationship between the biology and the mechanical processes to maximize the ABNR system's treatment impact.

"We, as a company, are only as good as our supply chain," explained Lind. "We needed people to rely on and Endress+Hauser is a world class company and has offered its technology, expertise and technical skills. Our performance as a company is dependent on the accuracy and timeliness of the data Endress+Hauser sensors give us."

Components:

- Promag® Electromagnetic Flowmeter
- Cerabar® M PMC51 Pressure Transmitter
- Liquiline® CM44x Transmitter: pH, Total Phosphorus, Dissolved Oxygen, TSS (total suspended solids), Conductivity.



Results: “Endress+Hauser does what they say and says what they do, our cultural core values align and these are critical for our relationship,” exclaimed Lind.

The benefits Clearas saw from working with Endress+Hauser technicians and products:

- Extremely accurate measurement
- Dependable quality
- Reliable and cost efficient
- Global presence
- Breadth of product offering
- Service support
- Ease of integration with system

The Clearas ABNR system benefits and results:

- Reduce phosphorus loads in post-secondary treated wastewater by an average of 93% in both municipal and industrial applications.
- Reduce nitrogen loads in post-secondary treated wastewater by an average of 33% in both municipal and industrial applications.
- Reduce phosphorus and nitrogen, increases dissolved oxygen, sequesters carbon dioxide, and positively impacts other constituents such as biological oxygen demand and total suspended solids.
- With a modular structure, the system can be scaled to fit any available footprint and has the flexibility to treat variable flow volumes. The Clearas system grows with you, scaling to comply with current permit requirements and accommodate discharge requirements of the future.
- Chemical treatment alternatives produce chemical sludge waste by-products with costly disposal fees. The system uses no chemicals, eliminates costly disposal fees, and produces only a natural biomass co-product for which markets are still being explored.
- The system is cost-competitive on a TCO basis with alternative technologies for ENR solutions, while achieving superior results and eliminating waste by-products.





Jordan Lind,
Chief Executive Officer

With more than 15 years of senior-level leadership experience in business development, sales, marketing, strategic planning and operations management, Jordan blends his corporate and entrepreneurial knowledge to lead the business development strategy for Clearas.



Kevin McGraw,
Operations Manager &
Co-Founder

Kevin blends his military background and industry expertise with over 20 years of leadership and entrepreneurial experience to lead the operations team for Clearas. His skills in solving complex problem and finding innovative solutions, at the intersection of technological and biological systems performance, are at the heart of Clearas' operations.

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