

## Downers Grove Sanitary District is now a

# NET ZERO ENERGY FACILITY

**H**istorically, water reclamation facilities have been heavy consumers of energy to operate the equipment needed to pump and treat collected sewage. The introduction of high efficiency equipment to the wastewater treatment market, coupled with rising electric costs and grant opportunities, has incentivized facilities to pursue energy reduction projects. Over the past 10 years, Baxter & Woodman has collaborated with the Downers Grove Sanitary District (DGSD) to achieve a goal of energy neutrality at its 11 MGD wastewater treatment center (WWTC).

The first task in achieving energy neutrality was to implement improvements reducing the facility's energy consumption by approximately 30%. These improvements included high-speed turbo-blowers with advanced controls for secondary treatment, grit aeration improvements, lighting upgrades, and HVAC improvements. The District received multiple grants that funded the high-technology devices to help make treatment more efficient. After reducing baseline energy use through these energy efficient projects, the District and Baxter & Woodman turned their attention toward options for generating renewable energy to offset total energy consumption at the WWTC.

Baxter & Woodman evaluated the sludge handling facilities and recommended improvements to strengthen the infrastructure that supports biogas-to-energy.

In 2011, the District opted to tackle energy generation in two phases. In Phase 1, the District pursued Combined Heat and Power (CHP) improvements to generate electricity and thermal energy from biogas. Baxter & Woodman worked with the District to implement a FOG receiving program to accept restaurant grease to boost digester gas production. The District

has seen its digester gas production more than double due to the hauled high strength waste. The 280 KW engine-driven generator installed in Phase 1 was able to offset approximately half of the electricity used at the WWTC, while providing a major portion of the digester heat load.

Phase 2 of the energy generation improvements included installation of a 375 kW CHP system that was brought online in May of 2017. The total electric generation capacity at the WWTC is now 655 kW, which is able to run all plant equipment during dry weather flow and also send electricity back to the "grid" for sale to electricity customers. May 31 marked the first day the District generated more energy than it used, with a goal of "net positive" over the next year.

The wastewater treatment center now recovers valuable energy resources and can produce as much energy as it uses. In recognition, the District has received a *Utility of the Future Today* Award from the National Association of Clean Water Agencies, the Water Environment Federation, the Water Environment Research Foundation and the United States Environmental Protection Agency.

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# IS IT TIME FOR A SCADA SYSTEM UPGRADE?

**C**ontrol systems are a critical part of water and wastewater operations. Supervisory Control and Data Acquisition (SCADA) components allow process equipment to typically operate automatically without operator intervention based on information from field instrumentation and devices. SCADA also notifies operations staff of equipment and process system abnormalities. As the pressure to be more efficient forces increased reliance on intelligent devices and automated systems, maintaining reliable and serviceable control systems becomes even more critical. Ideally, SCADA systems should be replaced using a planned approach, before becoming obsolete, or worse, forcing an unplanned/emergency approach.

**HOW DO I KNOW WHEN TO REPLACE MY SCADA SYSTEM?** There is no single answer, but a good rule of thumb is that SCADA servers should be replaced approximately every 5 years and industrial control hardware (PLCs, operator interface terminals and radios/telemetry) should be replaced about every 15 years.

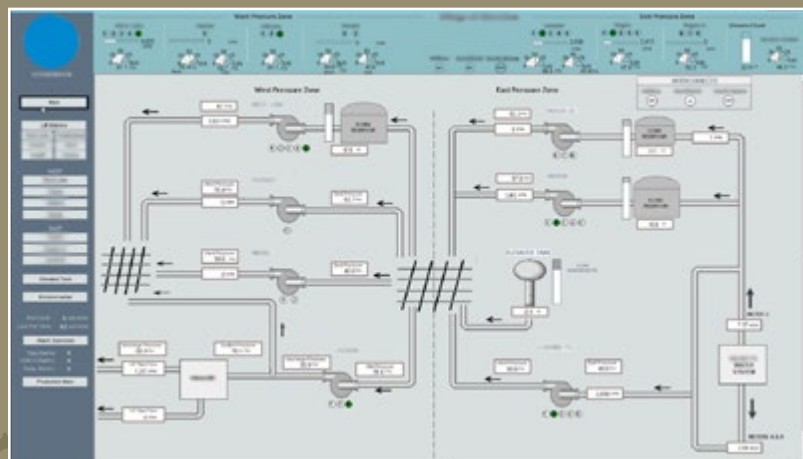
**WHY REPLACE SERVERS AND SCADA HARDWARE INSTEAD OF WAITING FOR SIGNS OF FAILURE?** Typically, servers run out of warranty and parts become harder to find after approximately 5 years, while industrial control hardware usually has a longer life span of about 15 years, at which time manufacturers may have new products available and are looking to stop supporting the old. In addition to the hardware/software simply becoming difficult to service, as with anything else technology related, new systems often provide more functionality and additional benefits to make your job easier.

Typically, the older proprietary systems from the 1980s were replaced in the early 2000s with PLC-based systems (such as Allen-Bradley SLC PLCs or PLC-5s, GE 90-30 PLCs, or similar). GE 90-30 PLCs and Allen-Bradley PLC-5 units are now obsolete, and the Allen-Bradley SLC Series PLCs have entered “active mature” which means that their replacement cost is much higher and they will be obsolete within a year or so. In addition, software and security enhancements over the last 15 years offer far more functionality. Recent system improvements include:

- Enterprise historians are replacing trends and provide more flexible and user-friendly data analytical tools for engineers and operators, without being logged into SCADA.

- Tablets and smartphones, combined with improved security provide highly portable and secure means for remote access.
- Newer theories in graphic screen development provide operators better situational awareness and detection of abnormal conditions, and allow for reduced training time for new staff.
- Aggregating data from multiple data sources like Automatic Meter Infrastructure, SCADA, and manual data entry for dashboards or browser-friendly displays is feasible.

With the growing options available in new SCADA systems, consider using an experienced SCADA engineer/consultant to help determine what hardware and software best fit your needs for your next upgrade. Moving forward with a major SCADA system upgrade can be costly, so proper planning is essential to enable you get the most “bang for your buck” out of your upgraded system. *Visit [www.goconcentric.com](http://www.goconcentric.com) for more information.*



## B&W PROJECT RECOGNIZED WITH NATIONAL ACEC AWARD

Baxter & Woodman's Wastewater Treatment Plant Combined Heat and Power Project earned a National Recognition Award at the American Council of Engineering Companies (ACEC) National Engineering Excellence Awards Gala on April 25, 2017, in Washington, D.C.

This award-winning project allows the Glenbard Wastewater Authority to produce electricity and thermal energy using digester gas generated during the plant's anaerobic treatment process. In order to meet a tight funding deadline, this project was designed, built, and operational in under 12 months.

Project Manager Christopher Buckley, PE, BCEE accepting the award. (shown second from the left)



## WE'RE GROWING!

Mathews Consulting, a Baxter & Woodman Company, has opened two new office locations in Florida. The firm will be providing general civil engineering and construction inspection services out of each location to better serve clients. For additional information please contact Dave Mathews at [dmathews@baxterwoodman.com](mailto:dmathews@baxterwoodman.com) or 561-425-7719.

The first new office is located in Broward County in the Cypress Park West Complex, 6750 N. Andrews, Fort Lauderdale, FL 33309.

The second office is located in the Florida Keys at 1111 12th Street, Suite 310E, Key West, FL 33004.



## B&W CONTROL SYSTEMS INTEGRATION IS NOW CONCENTRIC INTEGRATION

Baxter & Woodman's subsidiary B&W Control Systems Integration recently went through a rebranding process. This led to a change in name, updated logo and purpose.

*Helping leaders of progressive governments and utilities implement a roadmap to efficiency.*

The Concentric team is comprised of experts within systems integration, water/wastewater, and information technology. **Check out the new website at [www.goconcentric.com](http://www.goconcentric.com).**



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## STREAMLINED SURVEY PROCESS FOR INDUSTRIAL USER INVENTORIES

**P**ublicly Owned Treatment Works (POTW) with a federally approved Pretreatment Program are required to maintain an inventory of industrial users and annually identify new businesses in their service area. This requirement is mandated by the plant's discharge permit and 40 CFR 403. Additionally, many municipalities without a Pretreatment Program have been required to provide an inventory of industrial users to meet the requirements of their discharge permit.

B&W has developed a survey process that includes:

- Using an online database to manage business records
- Using a mobile tablet application to update business information in the field in real-time
- Obtaining business survey information online, input directly into the database by the businesses

Benefits of B&W's survey process include:

- Quick and easy to use online survey form
- Eliminates transcription errors from paper surveys
- Users are required to complete all questions
- Ability to track the status of surveys



- GIS layer can be incorporated into municipal GIS
- Highly customizable survey can be used to track business licenses, locate business with backflow preventers, and more

Recently, B&W has successfully used this survey system to identify users of Phosphorous containing products and reduce sources of Phosphorous, as part of the Influent Reduction Measures within the mandated Phosphorous Discharge Optimization Plan as required in newly issued wastewater plant permits.

For additional information, contact Nichole Schaeffer, P.E., [nschaeffer@baxterwoodman.com](mailto:nschaeffer@baxterwoodman.com) or Lisa Lucht, P.E. [llucht@baxterwoodman.com](mailto:llucht@baxterwoodman.com) at 815-444-3372.