

**Southern Region WWOA Meeting
Hosted by the Janesville WWTP at the
Pontiac Convention Center
Thursday – May 14, 2009**

There were 80 people in attendance at the meeting. We were greeted by Joe Zakovec – Southern District Chairperson who introduced City Manager Eric Levitt of the City of Janesville. Eric told the audience he has only been City Manager for a short period of time and has found the wastewater treatment plant to be a very positive experience. He appreciates that the facility is in compliance (not the case where he formerly was employed) and a very competent staff who are a pleasure to work with on a day-to-day basis. Eric recognized Dennis Egge, who recently retired as the City of Janesville Wastewater Treatment Plant Superintendent and Joe Zakovec who was recently promoted to Superintendent. He invited everyone to visit and enjoy the many features the City of Janesville has to offer – one of which is the park system and the many miles of paved trails.

Our first presentation was by Ray Grosch – IntelliSys Information Systems. Ray's PowerPoint presentation was titled IntelliSys Information Systems - Design, Build, Support your path to the Knowledge Staircase. Ray had information which shows that energy costs, a major O&M expenditure, accounts for 28% of a wastewater treatment plant budget. Wastewater and water operations account for 3% of all this country's electrical energy usage (56 billion Kw/yr). Energy costs are continually climbing and although many utilities have reduced energy use, energy costs continue to rise. Operation costs can be managed with the right tools reducing both usage and cost. EPA states that a "5% to 20% reduction in energy can be achieved at most wastewater facilities without the need of any major capital expenditures. Measurement and management is all that is required to achieve these savings. You cannot manage what you do not measure... Step 1 is to Audit utility bills; Analyze time of day usage; Analyze peak demand charges; Review seasonal variations; Track and trend daily energy use, peak demand, abnormal use periods; Automate reporting daily, monthly and yearly. Step 2 is to develop a Project List and Prioritize It. Step 3 is to Document Performance. Step 4 is to publicize Achievement and Step 5 is to Re-assess. EnergyView is proprietary Energy Management Software available to assist is energy conservation.

After our break, Jan Scott – Unison Solutions spoke to the group about Technologies for Biogas Conditioning. Equipment damage and performance issues are the driving force for conditioning biogas. The key system components of conditioning include; hydrogen sulfide removal, moisture removal, a compressor or blower, siloxane removal, controls/automation and carbon dioxide removal. Hydrogen sulfide needs to be removed to prevent equipment damage from corrosion (hydrosulfuric acid), health and safety issues (1000 ppm will cause an individual to become unconscious), odor control and prevent fouling of siloxane removal media. Moisture removal to prevent condensation downstream, improves energy content of gas, condenses in compressors, prevent the formation of weak acids from interaction with H₂S and CO₂ and prevent fouling of siloxane removal systems. Gas compression is accomplished by using either blowers:

Centrifugal – high cost, high compression and resistant to H₂S, Rotary Lobe (low cost but noisy), or Regenerative (low cost and low compression); or compressors: Flooded Screw – H₂S resistant, Sliding Vane – simple oil system but high temperatures. Siloxane is an organosilicon produced by Dow Chemical. It is used in the manufacture of many commercial products including makeup, tooth paste, shampoo, lubricants, and multiple other products. Siloxane is present in almost all digester gas from 500 ppbv to 140,000 ppbv. Siloxanes do not break down during processing at wastewater treatment plants or landfills. Pressure and temperature transform the siloxanes into various abrasive silica forms from sand to glass. Siloxanes cause damage to boilers, internal combustion engines and microturbines, with usage increasing 5-10% annually. Siloxanes are removed using; fixed bed carbon filters, fixed bed silica gel bead filters, regenerated desiccants, regenerated carbon, regenerated graphite and regeneration with microwave. Controls/automation are imperative to monitor and control inlet conditions, process conditions, outlet conditions and site conditions. End use of biogas includes direct use-boiler fuel, electrical generators, fuel cells, turbines, distribution pipeline injection and compresses gas for vehicle fuel. There are currently 75 systems in operation in the United States.

Steve Arant, Earth Tech/AECOM, gave the morning's final presentation – The Latest Blower Technologies – Are They Worth It or Are They Just a Lot of Hot Air. The general types of blowers include; Centrifugal (constant pressure, variable capacity) and Positive Displacement (constant capacity and variable pressure). A centrifugal blower converts kinetic energy into pressure energy. The centrifugal action increases the pressure at the outer wall of the volute. Increasing the volute area converts additional kinetic energy into pressure energy. A multi-stage centrifugal blower experiences headloss across multiple impellers, diffusers and return channels. High-speed single stage blowers provide required discharge pressure in single stage and eliminates headloss across multiple impellers, diffusers and return channels. There are generally 2 types of discharge diffusers; Volute dischargers which have a spiral shape with increasing cross-section area and Vane diffusers, which have a number of short expanding passages. The methods to control blower capacity include; inlet valve control, adjustable inlet guide vanes, adjustable discharge diffuser, combination inlet guide vanes and adjustable discharge diffuser and variable speed driver. The inlet control valve reduces the inlet pressure, which in turn reduces the capacity in terms of mass flow (with total head remaining constant) and the reduction in inlet pressure reduces horsepower. The adjustable discharge diffuser allows the head to remain constant and the capacity is adjusted by changing flow direction. Dual point control has the following; combination inlet guide vanes and adjustable discharge diffuser; combination variable speed and adjustable discharge diffuser; and PLC control – optimize efficiency at required flow and pressure. Variable speed blowers have the following; the blower flow rate is proportional to speed; blower head is proportional to speed squared; and blower power is proportional to speed cubed. The efficiency remains constant at variable speed. An ABS Blower is single stage, high speed VFD driven motor, magnetic bearing (oil free), air cooled VFD, controls and motor; and has a vaneless diffuser. A Turblex Blower is single stage; 3600 rpm to 20,000 rpm; oil lubricated and cooled; and has adjustable diffusers and inlet guide vanes. Other high speed single stage blowers, which are oil free and air cooled include; Atklax Copco,

KTurbo, Neuros and HAS. Steve mentioned Boyle's Law and Charles' Law before closing his presentation.

After lunch, Joe Zakovec conducted the business meeting for the Southern Region. After approval of the agenda, minutes and the Treasurers Report, Joe introduced Randy Thater, who told the group about various upcoming events of interest. June 4th is the Collection System Seminar in Watertown with another seminar being held in Marshfield on August 6th. There are 2 golf outings forthcoming (one in Lomira and another in Marshfield). There also is an operator's ride this summer. The WWOA annual conference will be held in Green Bay from October 6 to October 9, 2009 (pre-conference workshop will be 2 consecutive sessions). Randy also reminded the group about various scholarships and tuition reimbursements that the WWOA has to offer. The UW Water library is our reference library location. Please refer to the WWOA.org website for details about the library and upcoming events. Randy solicited nominations for various awards to be given out at the 43rd annual conference in Green Bay and to start thinking about nominations for next year's conference.

Joe presented Dan Lynch a plaque acknowledging the appreciation of the Southern Region for hosting the meeting in Janesville. Presently we are looking for host communities for 2010 and also seeking nominations for the Secretary to be elected at the next regional meeting, August 13th in Baraboo. After adjournment of the business meeting, door prizes were then drawn. Thank you to all of our vendors for the many prizes and support with their displays at the meeting and a special thanks to Madison Metropolitan Sewerage District for the use of their laptop computer!

DNR Update: Larry Benson, Basin Engineer for the Wisconsin DNR. Operators Certification, there have been a few changes. A few of the notable exam changes; Phosphorus Intro and Advanced exams have been rewritten with new comprehensive study guides available. May 6th was the last exam date and there were a few glitches with the newly released Intro and Advanced Phosphorus Exams. Those that took either of those exams in the A.M. are being given credit for all of those questions on the respective exams which were incomplete (3 questions on the Intro Exam and 9 questions on the Advanced Exam). Errata sheets were available for the afternoon examinees so the questions were all complete. The DNR promised to do a better job of proof reading before releasing new exams in the future.

Larry also reminded permittees to have the CMAR resolution passed by the appropriate local government body before submitting them to the Department. Permit backlog will continue to grow as the permit drafter for the Southern Region is working on a part-time basis. Your current WPDES permit is in effect until a new permit is issued.

Our next speaker was Larry Wavrunek from Rosemount Instruments and his topic was Wireless Instrumentation. The first step is to answer the fundamental question, "Where is my data?" What types of applications are targeted for monitoring and where do their data points exist? Many facilities lack the necessary hard wiring to allow the installation of typical data management transmission systems so a wireless device, or devices, may be

the most practical and cost-effective method of data acquisition. These wireless units are lithium battery powered (five to eight year battery life - battery technology is ever evolving so even longer lasting batteries are in development.) and have an integral antenna. The wireless units are capable of transmitting a signal between unobstructed devices of up to 750 feet. Moderate infrastructure between devices will allow transmission up to 250 feet and up to 100 feet with heavy obstructions. Devices serve as repeaters or a separate range extender can be utilized, although not frequently necessary. These wireless devices can serve as the backbone or extension of your current SCADA system to measure DO, TSS, pH and flow (to name a few). Easy integration into existing SCADA – nothing proprietary (5 levels of security). The devices are not intended to do continual monitoring but instead systematic monitoring. They are secure and reliable and will “talk” to the proper gateway (similar to walkie talkies). Wireless devices are frequently used in wastewater treatment plants – frequently for effluent monitoring, highest installation cost (trenching, wiring and conduit). Wireless devices are also used for tank level measurements. Another example given was to measure vibration (example: sludge pumps) to track trends on a pump or several pumps.

Jay Kemp, AECOM, then gave a brief overview of the Janesville wastewater treatment plant and directions on how to get to the site.

Finally, the members were given a tour at the plant by the entire Janesville staff (with refreshments provided by AECOM).