



Plant Profile Submitted by Ralph Phister

YORKVILLE-BRISTOL SANITARY DISTRICT

The Yorkville-Bristol Sanitary District received the Illinois Treatment Facility Operations Award at the 82nd CSWEA Annual Meeting.

The Yorkville-Bristol Sanitary District (YBSD) provides wastewater transportation and treatment services for the City of Yorkville, Illinois the county seat of Kendall County. The present service area is approximately 10 square miles with a population of 16,700. The current facility planning area is 33.8 square miles. The ultimate build-out of the service area is projected to be 50 square miles serving an approximated population of 100,000. The YBSD currently owns and maintains 13.63 miles of interceptor sewers ranging in diameter from 12" to 42".

Wastewater Treatment Plant Operations and Maintenance

The YBSD operates a single Wastewater Treatment Plant (WWTP), designed to treat 3.62 million gallons per day (MGD),

with a peak flow of 6.14 MGD. The WWTP is an activated sludge facility designed to provide secondary treatment. The wastewater flows through 6 mm screening and then is pumped through 1 mm screening. The wastewater proceeds to flow through 10 aeration basins, on to final clarification, and finally through an ultraviolet light disinfection (UV) system before entering the Fox River. The WWTP is currently operating at 70% of its designed capacity. The YBSD has six full-time employees, three certified operators, one laboratory technician, one secretary, and a director. A supervisory control and data acquisition (SCADA) system is used to monitor the equipment and processes. Information is networked using a modified Excel spreadsheet between operations, laboratory and the director's office. A monthly report is produced by each department and filed. The maintenance and house-keeping of the WWTP has been superb

for many years. The laboratory technician splits a sample every month with a certified outside laboratory to assure accurate analysis quality control.

Digestion

The YBSD uses autothermal thermophilic aerobic digestion (ATAD) that produces a class A biosolids.

This was the state of Illinois's first second-generation ATAD system supplied by Thermal Process Systems in 2003. The high rate digestion system uses thermophilic microorganisms which thrive at high temperatures (131-170F) to provide rapid aerobic digestion. Waste activated sludge (WAS) is thickened via a gravity belt thickener to approximately 6% total solids just before it is transferred into one of two digesters. The thickening step removes

excess water to allow the sludge to heat up on its own (self-heating) thereby eliminating any boiler operation and gas handling requirements and also reduces the size of the digester required for treatment. After the thickened material is fed into the digester, the hot reactor contents lyse the cells releasing the internal material for consumption by the hemophilic bacteria. During this stage of the operation the high temperature conditions also destroy pathogenic microorganisms providing for an EPA defined 503 Class A materials for liquid or solids processing. Volatile solids reduction (VSR) in the ATAD system is on the order of 70% which equates to about a 55% total solids reduction. The virtually pathogen-free material is further treated in the aerated storage nitrification/gentrification reactor (SNDR) to reduce the concentration of ammonia and precondition prior to dewatering operations. The SNDR also contributes 10%-15% additional VSR and more importantly reduces the polymer required to achieve between 25%- 30% cake solids in the centrifuge dewatering operation, reducing the total mass transported and disposed of off-site by about 75%.

Growth Challenges

Since the year 2000 the YBSD has experienced tremendous growth challenges. An article and picture of the City of Yorkville downtown area appeared in the newspaper *USA Today* March 25, 2008 declaring Kendall County the fastest growing county in the nation. The YBSD completed a wastewater treatment expansion and upgrade in 2003 at a cost of \$11,200,000. The WWTP capacity was increased from 0.993 MGD to 3.62 MGD. Within the last five years the district has accepted ownership of 12.61 miles of interceptor sewers ranging in size between 18" and 42" in diameter at a cost of \$20,503,724.44.

Industrial, Commercial Pretreatment Program

Due to the tremendous growth, customers requiring grease interceptors increased to



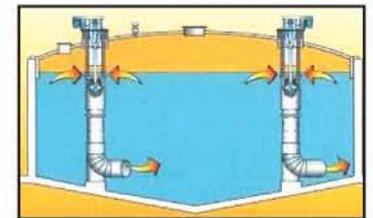
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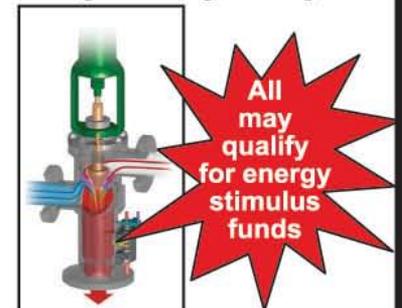


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almost 60 between 2004-2008. August of 2007 the YBSD passed a comprehensive fats oils and grease ordinance regulating these customers. The YBSD has become very aggressive in the enforcement of this ordinance and has actually decreased the loading on the WWTP during the high growth years. Also the YBSD has a company that discharges ice cream waste. The discharge strength of this waste has at times exceeded 50,000 mg/l BOD. Through the enforcement of the YBSD Excessive Strength Waste ordinance this company pays for its excessive strength waste and through pretreatment

regulation normally the BOD is less than 800 mg/l. Additionally the YBSD serves a company that discharges food grade oils that make up salad dressings. This company now removes these oils and transfers them to an oil reclamation facility.

Capital Projects

The YBSD recently completed installation of an additional centrifuge to dewater its biosolids. This was a design build project with most of the work being performed at the oversight of YBSD employees. The construction project of building a bridge across the Blackberry Creek was

completed in May 2009 at a cost of approximately \$600,000. The bridge will provide access to nearly 20 acres that will accommodate a new sequencing batch reactor (SBR) and a membrane (MBR) process. The YBSD has awarded a contract to Walter E. Deuchler & Associates to design a 2.3 MGD SBR followed by a MBR process. The facility will also include fine screening and an additional ATAD digestion system.

This design will be completed in October of 2009 and the estimated cost to build the facility is \$25,000,000.

YBSD Website

The YBSD has a website (ybsd.org) containing ordinance specifications regulating the sanitary sewer collection system and waste discharges. Connection, annexation, infrastructure, review, and user fee costs are described and explained. Pictures of the WWTP processes and capacities are also shown. [CS](#)



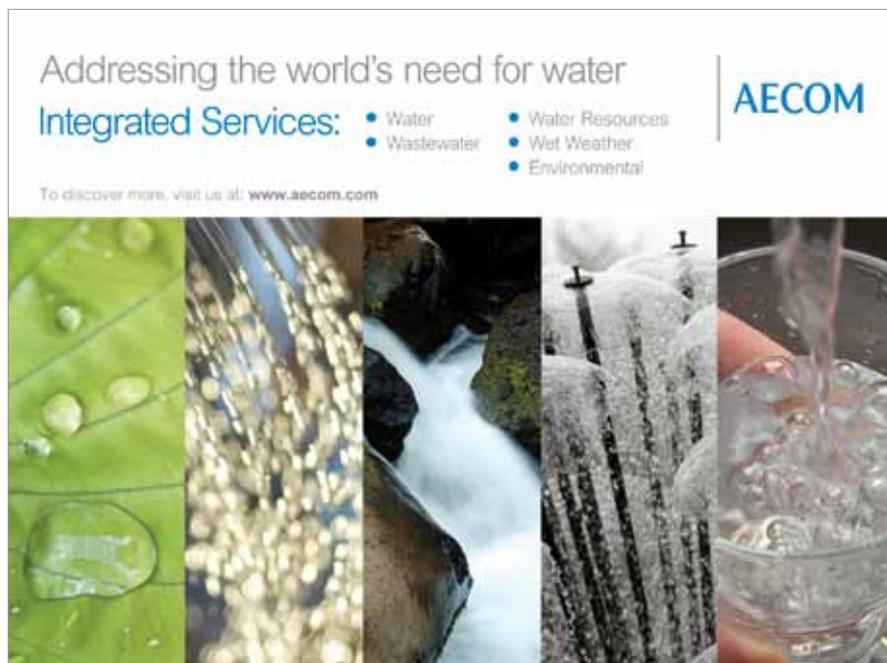
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