City of Marengo Solves Wastewater Plant Dilemma with Dynablend™ Liquid-Polymer Technology

The City of Marengo, Illinois is a growing municipality of nearly 8,000 people located 60 miles northwest of Chicago and 15 miles south of Wisconsin. The city operates an activated sludge wastewater treatment plant that processes an average volume of 1.8MGD with a maximum capacity of 5.94MGD. In the fall of 2007, the operators of the plant began to observe reduced performance of their liquid-polymer feed system that was in place at the city's facility. This system was used to treat wastewater and played a crucial role in transforming the solid waste and sludge that are collected into a usable end-product.

The Marengo plant utilizes a multi-stage activated sludge treatment process to effectively treat the 1.8MGD of influent. The process includes initial screening of the influent to remove large debris and eliminate items that can potentially damage the wastewater process equipment. After the primary treatment of the wastewater, the sludge is pumped into an oxidation ditch for secondary biological treatment. Once the final clarification process is complete, the remaining water is disinfected and released into the Kishwaukee River.

Any solids that remain in the clarifier are either pumped back to the oxidation ditch or moved into a sludge-processing system. In the sludge-processing system, the solid waste is transferred into a tank and then run through a centrifuge for thickening. Liquid polymer is introduced during this phase of the treatment process to aid in the flocculation of the suspended solids and produce a thickened sludge that is more easily dewatered. The thickened sludge is then transferred to an anaerobic digester where the solids are broken down further before being fed to a dewatering process. When the sludge is completely thickened and dewatered it is moved to a storage building before it is removed and used as a fertilizer.

The performance of the sludge-processing system was beginning to be compromised by the unreliability of the equipment used to feed the liquid polymer. The liquid-polymer system was old and failing and the operators recognized the needed to replace the equipment in order to keep the plant functioning properly. Based on the process parameters of the Marengo wastewater treatment plant, the Dynablend™ liquid-polymer-blending technology was recommended to the staff at Marengo. The City arranged to have a demonstration unit to pilot the product for several months prior to purchasing. The Dynablend™ liquid-polymer unit was a good fit for the Marengo plant because of its reliability and

performance over a wide range of polymers commonly used for sludge processing. The unit was also easy to operate and maintain. In addition, the Dynablend™'s mixing chamber supports the science of polymer activation; high initial mixing energy followed by a low energy "quiescent" zone. The high volume of the mix chamber optimizes residence time allowing the polymer to fully hydrate. The system's injection check valve has also been designed with easy disassembly and inspection in mind, eliminating a maintenance concern that can plague other systems. The Dynablend™ footprint measures only 24-inches deep by 24-inches wide by 68-inches (61 x 61 x 173 centimeters) tall, minimizing the use of valuable space and eliminating much of the clutter that can be found in the sludge-processing area of a wastewater-treatment facility. The liquid polymer can be pumped directly into the Dynablend™ from a storage vessel such as a 55-gallon (208 liter) drum on an as-needed basis. This helps reduce the chances of a polymer spill occurring. After a successful pilot program, the City of Marengo purchased a permanent Dynablend™ liquid polymer activation system.

As a result of the demonstration unit, operators noticed several operational improvements right away. It was easier to set the dials for the feed rates for the dewatering or thickening process. In addition, operators were able to shorten the length of time needed for the process and save on the amount of polymer used. The product demo allowed operators to realize a quick payback on the cost of the equipment was possible.

"It delivers the polymer at either a low-flow rate or high-flow rate, is pretty much maintenance-free, which is nice, it's easy to operate and troubleshoot, and, perhaps best of all, it's a workhorse. I have no negative things to say about it since I've been here."

Jay Berman, Superintendent, Marengo Wastewater Treatment Plant