

Replacing Sludge-Drying Beds with a Compact, Fully Automated Screw Press Delivers Huge Benefits



"The return on investment is awesome! Whenever I go into the sewer plant I just want to hug that press. We are that proud of it because it makes the plant such a better place to work."

-Shelby Biggs, Superintendent of Utilities and Streets, City of Casey, IL

The city of Casey, Illinois (pop. 2,664) is known as the home of big things—including the world's largest rocking chair, wind chime, mailbox, and golf tee. Over at the city's wastewater treatment plant, they had a sludge dewatering headache of equally large proportions. The solution turned out to have a remarkably small footprint—and a very big impact on operational costs.

Built in 1980 and substantially upgraded from a package plant to an advanced oxidation process (AOP) in 2018, the city's wastewater treatment plant is designed to handle up to 20.5 million gallons per day (MGD). The plant consists of an oxidation ditch extended aeration system with a design average flow (DAF) capacity of .75 MDG and a design maximum flow (DMF) of 1.5 MGD, and secondary clarifiers. The plant discharges effluent into the Quarry Branch, a tributary to the Embarrass River, with discharge parameters that include biochemical oxygen demand (BOD), total suspended solids (TSS), ammonia nitrogen, fecal coliform, phosphorus, and pH.

Challenge: Labor-intensive dewatering process

The source of the city's wastewater headaches was its sludge dewatering process, consisting of three 42.5' x 30' sludge-drying beds. The labor-intensive process required the plant's two-man crew to follow a series of hands-on steps for each of the three drying beds:

1. Prepare the beds for sludge dewatering with a undercoat layer of sand.
2. Pull the polymer flocculation chamber trailer outside to the drying beds.
3. Connect the sludge line from the plant to the polymer flocculation chamber.
4. Connect a four-inch discharge hose to the polymer flocculation chamber and lay the hose through the entire length of the sludge-drying bed.
5. Start the sludge pumps and activate the polymer pump/mixing process.
6. Assure that the sludge pumps out uniformly in the drying bed until the bed is full.
7. Move equipment and repeat for the other two beds.
8. Clean and put away hoses and equipment.
9. Wait for the sludge to dry—this could take from



three days to three weeks depending on the weather.

10. Once dry, the sludge was loaded into a dumpster for disposal at the landfill.

“With two guys working the plant, they have a lot of things to do, from maintenance to mowing in the summer. The Q-Press has freed up a lot of time.”

- Shelby Biggs, Superintendent

This process was extremely time-consuming—up to 10 hours each time—and forced plant operators to work outdoors in inclement weather, making the job even more unpleasant and risky. Weather conditions also impacted the effectiveness of the drying beds. In rainy weather or during cold and snowy winter months, dewatering took far longer and often resulted in a wetter, heavier product. The aging sludge in the digesters was more difficult to dewater than the younger digested sludge.

The process was also costly. The labor cost alone amounted to \$20,000 a year. Disposal costs were also high, as the sand layer in the beds and residual water were hauled away with the sludge, adding significant weight to each dumpster. If a dumpster

was above the landfill's weight limits, a hefty penalty was added to the already high disposal fee. In total, the City of Casey Sewer Department spent approximately \$40,000 per year for sludge disposal.

Solution: State-of-the-art, automated screw press

Recognizing the need for a more modern, efficient dewatering solution, the City of Casey chose a HUBER Q-Press 280 Screw Press following a successful pilot test. Because the city has electricians on staff, the unit was easily installed by facility staff in just a couple of weeks, helping reduce costs and getting up and running quickly. The only real modification to the plant was the replacement of a 4" floor drain with an 8" drain to handle the flow due to the unit's high dewatering performance. Following installation, HUBER Technology technician spent a week on-site training plant operators.

A key advantage of the system is that it is installed indoors, taking up just a small footprint. This enables consistent drying, rain or shine. The resulting dried sludge is stored in indoors, retaining dryness prior to disposal.

The screw press is self-contained, consisting of a conical screw shaft and cylindrical sieves with three treatment zones: inlet and drive zone, three-part thickening and dewatering zone, and press zone with pneumatic counter-pressure cone. The unit is automated, with built-in sensors to control pressure and ensure a consistently high filtrate quality.

Designed for ease of operation, the automated screw press runs unattended. Operators simply push a button to initiate the dewatering process and can then walk away from the unit and focus on other tasks. They typically run the screw press 2 to 4 days a week for 8 hours per day. The enclosed design, automated wash cycle, and stainless



steel components simplify cleaning and minimize maintenance, saving even more staff time. Clean-up requires just 30 minutes after each day of operation.

Replacing a low-tech process with a compact, high-tech system was a big change. The unit has been rock-solid reliable. Whenever plant operators have had questions or needed assistance, technology support from HUBER has been extremely responsive and helpful.

"You just hit the start button, make the sure the polymer and sludge pumps are running and then you can just walk away from it."

- Shelby Biggs, Superintendent

Impact: Big time and money savings

With the HUBER Q-Press, the Casey facility has seen dramatic improvement in the cake produced. While the drying beds typically produced on the order of 8% total solids under good weather conditions, they now consistently achieve approximately 23% total solids regardless of weather or time of year. This dramatically reduces the weight of the dried sludge heading to the landfill.

“We’re now getting around 23% total solids, so that’s really good. With the drying beds, we got wet sludge plus wet sand.”

- Shelby Biggs, Superintendent

This improved dewatering performance, together with elimination of the sand, has saved the city \$25,000 per year in disposal costs—slashing this cost by more than half. In addition, it has dramatically reduced staff time and effort associated with dewatering. Total operating costs have been reduced by approximately \$40,000 per year.

Based on these savings, the City of Casey is on track to achieve a complete return on its investment in just three years.

The Q-Press has also meant a more pleasant and safe work environment. What was once a dirty,

“Now, we can dry our sludge consistently any day of the year, no matter what the weather conditions are.”

- Shelby Biggs, Superintendent



tedious, time-consuming, weather-dependent process is now the push of a button in a safe, clean environment—freeing up resources for projects to improve plant operation and maintenance.

Replacing the old labor-intensive, weather-dependent dewatering process has been a real game changer for the City of Casey. When they reflect on the impact of the HUBER Q-Press on their operations, they can now lay claim to the world’s biggest smile.



HUBER serves the municipal and industrial wastewater treatment market with high quality liquid-solid separation technology. HUBER Technology offers the complete chain of screening, grit and sludge handling processes. The company is an original source manufacturer specializing in stainless steel fabrication of technologies for water and wastewater with proven experience and expertise with over 40,000 installations worldwide.