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Thompson Pump Midwest & ITT Flygt Canada Work Together on Kingston West Sewage Treatment Plant Bypass

The Kingston West Sewage Treatment Plant, located in Kingston, Ontario, Canada, handles a population of 44,000 people plus, a nearby industrial plant. The treatment plant, which was in desperate need of upgrading, hired the services of general contractor T A André to handle the work. Bypass systems were specified to enable the incoming effluent to be re-routed and allow construction for the upgrade, while not disturbing the day-to-day operation of the treatment plant. The general contractor turned to ITT Flygt Canada to plan and install the bypass system.

Overview of the first bypass system.

Ivan Morse, Flygt's Customer Service Director, determined that two separate bypasses were needed to redirect the incoming flow. The first bypass would require pumping from a manhole opening and discharging into two different locations. A service road needed to be maintained between the pumps and the clarifyers to allow vehicles the access to the station where upgrades took place. These were considerable obstacles to the bypass system layout. The system also had to account for line flows during normal operation that reached as much as 6,000,000-gallons per day.

Another consideration was that the vertical distance from the sewer line floor to the top of the manhole opening was 16-feet. Should peak flows force sewage past that point, there was a possibility of the sewage overflowing across the treatment plant facility. The pumps that were specified needed enough capacity to handle the flows and prevent the sewer from overflowing, and have enough reserve capacity for critical peak flows.

Three Thompson 6-inch Portable Solids Handling High Pressure Jet Pumps are strategically placed around a manhole opening.

Because the best submersible pumps for the job were too large for the manhole shaft for the first bypass, the Flygt team contacted Thompson Pump Midwest, located in the metro Detroit area. Midwest President, Brian Lenaghan, immediately traveled to the Kingston Treatment Plant to consult and assist Flygt in preparing the bypass system layout. Lenaghan recommended strategically placing three Thompson Pump 8-inch Solids Handling High Pressure Pumps around the manhole. One pump was utilized as the primary unit. The second was used to handle peak flows and the third offered 100% redundancy.

The Thompson 8-inch Solids Handling High Pressure Pumps are capable of 2,500-gpm, with a shut-off head of 165-feet, are equipped with the exclusive ENVIROPRIME® Compressor-Assisted Priming System. The ENVIROPRIME® Priming System is perfect for bypass pumping because of its ability to eliminate the blow-by which is experienced when sewage (or any other pumping fluid) enters the air-handling priming system, and is expelled onto the ground. This is a considerable feature when environmentally harmful fluid, such as sewage, is being pumped.

The primary pump operated continuously while the secondary and third units were equipped with Thompson's Automatic Start/Stop Control Panel and dual float system, which regulated each pump's operation as the flows fluctuated throughout the bypass. Thompson Pump Midwest also supplied about 300-feet of High Density Poly-Ethylene (HDPE) pipe and about 200-feet of 12-inch Thompson Galvanized Pipe and Galvanized Piping Accessories in order to direct the sewage.

Manifolds, such as above, directed the sewage to discharge points.

The 8-inch discharge pipes from the three pumps were directly connected to a common manifold bringing the sewage into one common 12-inch line. The sewage was then directed to discharge points by a series of tees and valves placed along the common line leading to the two discharge points. This gave crews the ability to open or close sections of the discharge system at their discretion.

With the first bypass installed and operating successfully, a second bypass was to be started. Located in an open chamber where submersible pumps could be implemented, Flygt supplied three submersible 75-hp Flygt Pumps, which together handled a flow of more than 6,000,000 per day.

Thompson Pump Midwest's bypass designs adapted very well to any variations in effluent flow, enabling the treatment plant to operate without disturbance or down time while the sewer lines were successfully upgraded. Plant Management was both pleased and impressed with the results of the efforts of Thompson Pump Midwest and ITT Flygt Canada.

The Kingston West project is one example of how Thompson Pump portable pumps, ITT Flygt submersible pumps and applications engineering can be utilized to achieve a common goal and provide a complete package powerful enough to handle any pumping application.

Two of the discharge points for the sewage from the manhole opening. Check valves and gate valves were used to regulate the flow, and to have the ability to open or close sections of the discharge system.