

# Cutting Vibes and Reducing Maintenance

Xylem helps township eliminate pump station vibration and excessive upkeep.

Ada Township—population of about 13,000—is located several miles east of Grand Rapids in Kent County, Michigan. The township owns and operates its own sanitary sewer collection system and is responsible for all maintenance and replacement. The majority of the collection system flows by gravity to a pump station, where it is sent to the City of Grand Rapids. Total flow is around one mgd.

## Scope

Ada's main pump station had become unnecessarily complex over the years. For example, the pumps had so many moving parts that they had become increasingly expensive to maintain. The old pumps were constantly under repair. Seals were always failing and vibrations were so bad that the pumps had to be held down with sand bags. When excessive vibration and seal failures became chronic, Ada Township knew it required a new approach to the problem or its budget was going to take a major.

The old pumps had seal pots that kept the pressure above discharge, then they put in an air compressor system as the pot would need to be re-charged frequently.

After huddling with its consultant, Moore & Bruggink, Ada and their engineering firm contacted Kennedy Industries for assistance. Working off their extensive experience with Xylem's dry pit submersibles, the professionals at Kennedy immediately recommended the installation of three Flygt model 130-horsepower NT-3315's to deliver 1,400 gallons per minute at 205 feet of total dynamic head.

## Solutions

The pumps were changed out one unit at a time. First, one of the old pumps was removed along with its shafting, pillow block bearings, guards, seal water pots, seal water piping, air compressor lines, air compressor, and vertical motors. New pump installation was easy because these dry pit submersibles do not require a seal water system, coupling, shafting, guards, or any other auxiliary items.



BEFORE: Sand bags were placed on the pumps to decrease vibration



AFTER: Standard air cushioned check valves and Pumpsmart VFD's allowed for the elimination of the old style hydraulic oil operated valves decreasing complexity of the system

**Customer:** Ada Township, MI

**Challenge:** Old pumps were constantly under repair

**Products:** N-technology Impellers, Inspection Chamber, ActiveSeal™

The pumping assembly is designed for continuous operation in either a non-submerged or fully submerged environment. The motor is inverter-rated per NEMA MG1, Part 31 and is available as premium efficient. Variable frequency drives and air cushioned check valves were also added. A Hard Iron™ (25 percent chromium) impeller and insert ring are standard on all the company's pumps above ten horsepower.

The dry pit submersibles also provided maintenance advantages over the township's existing pumps, saving the township \$5,000 to \$6,000 annually since installation that was previously spent on unscheduled visits to the main pump station. For example, the dry pit submersibles feature:

**N-technology Impellers.** These impellers are self-cleaning, raising efficiency and reducing unplanned maintenance visits. Stringy fibrous material and modern trash that enter the inlet of a conventional pump often get caught on the leading edges of the impeller vanes, reducing efficiency and increasing power consumption. In addition, should solids continue to build inside the impeller, motor thermal protection can trip and cause the pump to stop, all of which leads to expensive unplanned service calls.

**Inspection Chamber.** To increase operational reliability, an inspection chamber between the seal unit and the bearings enables rapid spot checks and maintenance.

**ActiveSeal™.** The Active Seal system is a zero-leakage double-seal system that actively prevents liquid from entering the motor cavity, thereby reducing the risk for bearing and stator failure.

Finally, since the new pumps are submersible, if the station floods they would remain undamaged, unlike the previous pumps. And operator safety has been dramatically improved since they no longer have to maintain 25-foot long shafting or frequently remove the pumps for repair.

## Results

Greasing motor and pump bearings, shaft maintenance, and shaft U-joint alignment and balance are all tasks of the past. Ada Township is now the proud owner of three new submersibles that run smoothly and quietly. In fact, an operator once reached into his pocket and pulled out a nickel. He then stood it vertically on end while the pump was running; hours later the nickel was still in the exact same position. It is safe to say that these three dry pit submersibles will now provide the township with reduced maintenance and no unnecessary repairs for many years to come.

The customer was amazed at the difference between the two different style pumps with regards to the running vibration level and noise. The Flygt dry pit submersible ran smooth, cool, and quiet.



Closed loop cooling of the motors eliminated seal water piping, seal pots and the compressor

Xylem, Inc.  
14125 South Bridge Circle  
Charlotte, NC 28273  
Tel 704.409.9700  
Fax 704.295.9080  
855-XYL-H2O1 (855-995-4261)  
[www.xylem.com](http://www.xylem.com)

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