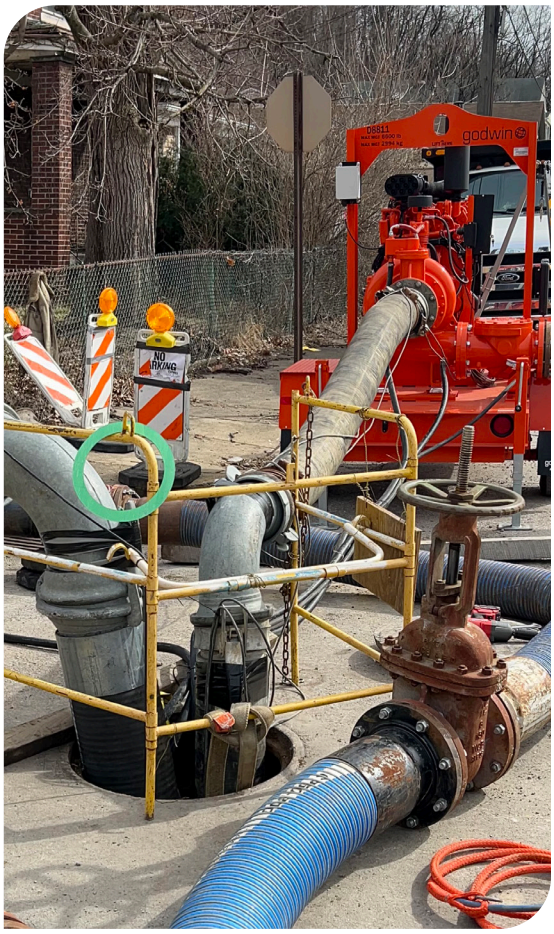
Case study
Godwin Pumps CD200S

Xylem bypass system helps facilitate pump station upgrades

Godwin pumps used to reroute wastewater during rehabilitation project

Allegheny County Sanitary Authority (ALCOSAN) is a municipal authority that provides wastewater treatment services to 83 communities, including the city of Pittsburgh, reaching a total population of 1.2 million people.



Along with wastewater treatment services, the nearly 80-year-old agency also delivers environmental protection programs and oversees infrastructure development and repairs of sewage lines and related sewage facilities.

Challenge

McKees Rocks, one of the Pittsburgh boroughs ALCOSAN serves, is located about 10 minutes south of downtown. Its sewage facility, in service since 1964, sits along the Ohio River and faced a serious problem – the primary pump's discharge fitting had worn out and developed holes after years of use, causing flow to be pumped back into the wet well. A failing 60-inch slide gate also needed replacement.

To resolve these issues, the incoming sewer line had to be bypassed and discharged into a downstream manhole approximately 20 feet away. But the bypass project itself posed multiple challenges. The sewage facility is in a densely populated residential neighborhood, where noise and the risk of basement flooding are significant concerns. And because of its location near the river, there could be no downtime due to the danger of sudden overflows.

ALCOSAN and a local contractor engaged Xylem to execute the bypass and provide 24/7 pump monitoring. While assessing the situation, Xylem identified additional issues. The application's peak flow of 1,876 GPM exceeded the capacity of most 6-inch pumps, and the 20- to 24-foot suction lift to the impeller posed challenges for most 8-inch pump designs with high NPSHr (Net Positive Suction Head required). This high NPSHr reduces flow capacity at higher suction lifts. An 18-inch invert restriction that limited the suction hoses presented another complication. The manhole could not be surcharged due to the risk of flooding nearby residential homes, and the system also had an exceptionally low head condition.

Solution

Considering all these factors, the Godwin CD200S pump emerged as the ideal solution. Its newly designed impeller and volute feature remarkably low NPSH requirements and experience minimal flow reduction even under high suction lifts. Additionally, the pump has a small footprint – an important benefit since the adjacent roadway had to remain open for local businesses.

The Xylem team deployed one CD200S critically silenced, skid-based diesel unit as the primary pump and one CD200S open, trailer-mounted unit as the backup pump. Each pump was equipped with suction and discharge transducers, discharge pressure gauges and Field Smart Technology. The team installed gate valves on the discharge lines to create back pressure, enabling the pumps to operate more efficiently. They also put discharge dip tubes in place to direct flow and prevent residential flooding. The primary pump was operated in manual mode, running continuously throughout the repairs, while the backup pump ran in auto mode with mechanical floats.

ALCOSAN used Field Smart Technology for telemetry and to monitor pump performance by tracking suction and discharge levels, engine RPMs, temperature, fuel level, fuel consumption rate, oil pressure and battery level. This system, combined with on-site pump oversight, provided customers with confidence and peace of mind.

Results

ALCOSAN engaged Xylem due to the Godwin brand's strong reputation for quality and reliability, along with the comprehensive local and international support offered. The collaboration continued a long-standing partnership between the organizations, as Xylem has worked with ALCOSAN on projects both large and small throughout Allegheny County, delivering high-quality service and products.

> "We were very happy with how everything worked out with working with Xylem…[The solution] did a great job on keeping up with the flow. I was also impressed with how quiet the pump was."
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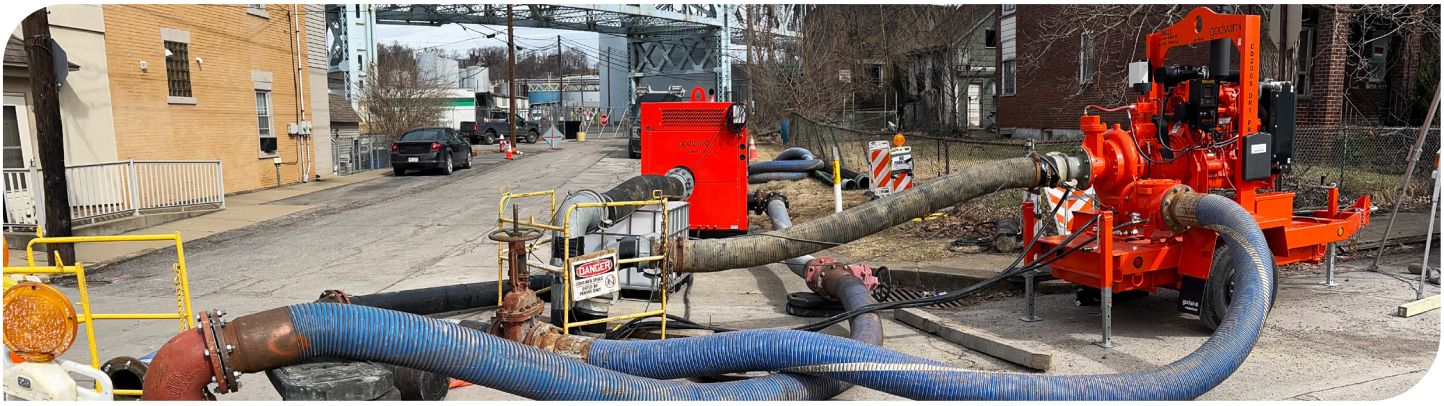
> Zachary Hughes, project engineer, ALCOSAN



Xylem
639 Davis Dr,
Morrisville, NC 27560

xylem.com/godwin