

Providing clean water for a city required a full-service pump solution.

Designing, Engineering, Manufacturing and Delivering a Complete Pump Solution.

SUMMARY

A municipal water treatment plant in northern Minnesota required a newly engineered and upgraded raw water supply system - designed with a complex pumping system. The client turned to GPM for a turnkey pump solution design, engineering and manufacturing services.

THE SITUATION

After consulting with the end-user and reviewing all the application data, GPM needed to understand the environment in which the pumps would operate. The application's location in a northern climate made it susceptible to freezing and sub-zero temperatures for months at a time, so the pumps had to be installed in a fully insulated and temperature-controlled pump house.

Additionally, because rotating equipment requires routine maintenance for optimal performance, the enclosure had to be easily accessible. With an understanding of the complex challenges ahead, the GPM engineering team got to work designing a complete pumping solution.

OUR APPROACH

GPM begins with a deep dive to understand each client's specific needs. This allows us to work strategically and efficiently to select the right pump and design the right system for the job.

After determining how much flow and pressure the system would require and deciding on the temperature-controlled pump enclosure, we evaluated potential installation and operation methods for this complex system.

While shore-mounted systems have advantages, barge-mounted pumps are essential in extreme climates or applications that experience significant fluctuation. The benefits of a floating barge-mounted system for this engineered application include:

- Fully insulated enclosure
- Removable roof for maintenance access
- Consistent pump suction regardless of water level
- Pumping deeper/cleaner water for reduced foreign matter
- Electric heat for constant temperature control
- Ventilation fan for cooling



Floating Barge - Exterior



Floating Barge - Interior Pumps

System requirements:

- 400 usgpm @ 277' TDH
- 2 pump system for redundancy (1 pump runs at a time)
- Barge-mounted floating pump house

THE SOLUTION

We knew what we needed to do, so our team got started on building the complete engineered solution. First and foremost, we selected the right pump for the job. For this application, (2) Flowserve 8EML-3 Stage pumps each equipped with 50hp 1800 RPM motors were selected due to their unique performance characteristics being very close to the pumps designed Best Efficiency Point (BEP).

Next, we needed to join the 2-pump system's discharge lines into a common header inside the pump house. This also kept the pump house enclosure within a reasonable footprint. The system also included two check valves (one for each pump), two isolation valves, two pressure transmitters, an automatic drain valve and an electromagnetic flowmeter just before the water exits the pump house.

The electromagnetic flowmeter allows end-users to verify how much flow is being pumped back to their system and tracks accumulating total gallons pumped. Demand for this system was approximately 75,000 gallons per day. That's 525,000 gallons per week or more than 27 million gallons every year.

The system required a stout floating barge to float the necessary pumping equipment and the pump house enclosure. It also had to withstand dramatic seasonal temperature swings and freezing conditions. We selected a high-density polyethylene (HDPE) float with an engineered steel frame foundation for this application.

HDPE offers UV and corrosion resistance and 4x higher wear resistance to steel.

Lastly, we included an engineered walkway that allowed employee access to the pump while also accommodating electrical infrastructure and providing a route for water discharge piping.

THE GPM DIFFERENCE

GPM is proud to be a total solutions provider, and this project represented a wide spectrum of our design, engineering and manufacturing capabilities. We also included technological enhancements to the system that enabled remote capabilities for starting and stopping pumps and controlling valves, remote monitoring, and ice-eater bubblers around the barge to eliminate freeze-up. These features are easily accessible from the water treatment plant or even a mobile device.

We're proud of the solution we delivered. The finished product was designed, engineered and manufactured by GPM, Inc., alongside partner consultants. We worked alongside the general contractor to deliver, install and commission the system, which is now successfully pumping a city's new water supply. We raise our glass (of fresh, pumped water) to helping another customer develop a unique solution as a full-service partner.



Interior Pumps Being Assembled



Barge Assembly

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