

MWI Aids in Dam Removal by Bypassing 580,000 GPM

MWI Redirects Stormwater During Dam Excavation with Turnkey Temporary Bypass Pump Station



BACKGROUND

In Virginia, a college nestled in a valley with a 20-acre lake faced a significant challenge due to the aging infrastructure of its dam. In 2018, severe rainfall caused the lake to rise dramatically. The dam, which held the lake in place, and its valve system failed, leading to near-catastrophic flooding. A seized valve prevented the lake from draining, forcing water over the earthen dam and putting residents downstream at serious risk.

This incident highlighted the dam's deficiencies, leading to a decision by the city to investigate whether the dam should be repaired, replaced, or decommissioned. A study classified the dam as high-risk, largely due to urban development around the lake that increased stormwater runoff. Eventually, the city determined that decommissioning the dam and transforming the area into a wetland park would be the best solution to mitigate future flood risks and meet regulatory requirements.



SOLUTION

To address the dam removal, the city first relocated the road that previously ran over the dam and constructed a new bridge adjacent to the college lake. Once the new road and bridge were completed, the city contracted Water Management Solutions, Inc. (WMS) and English Construction to remove the dam and implement stormwater controls.

WMS collaborated with MWI Pumps to install, test, and operate a 1300 cubic feet per second (cfs) temporary pump station bypass system, which moved 580,000 gallons per minute. This bypass system allowed the safe removal of the dam, mitigated the risk of flooding, and protected the construction site during the dam's decommissioning.

The solution involved draining the 20-acre lake and building a new weir/dyke system to safely redirect stormwater through a new wetlands park and under the newly constructed bridge. WMS designed the system, completed the installation, and oversaw operations throughout the breaching of the College Lake Dam.

The system included:

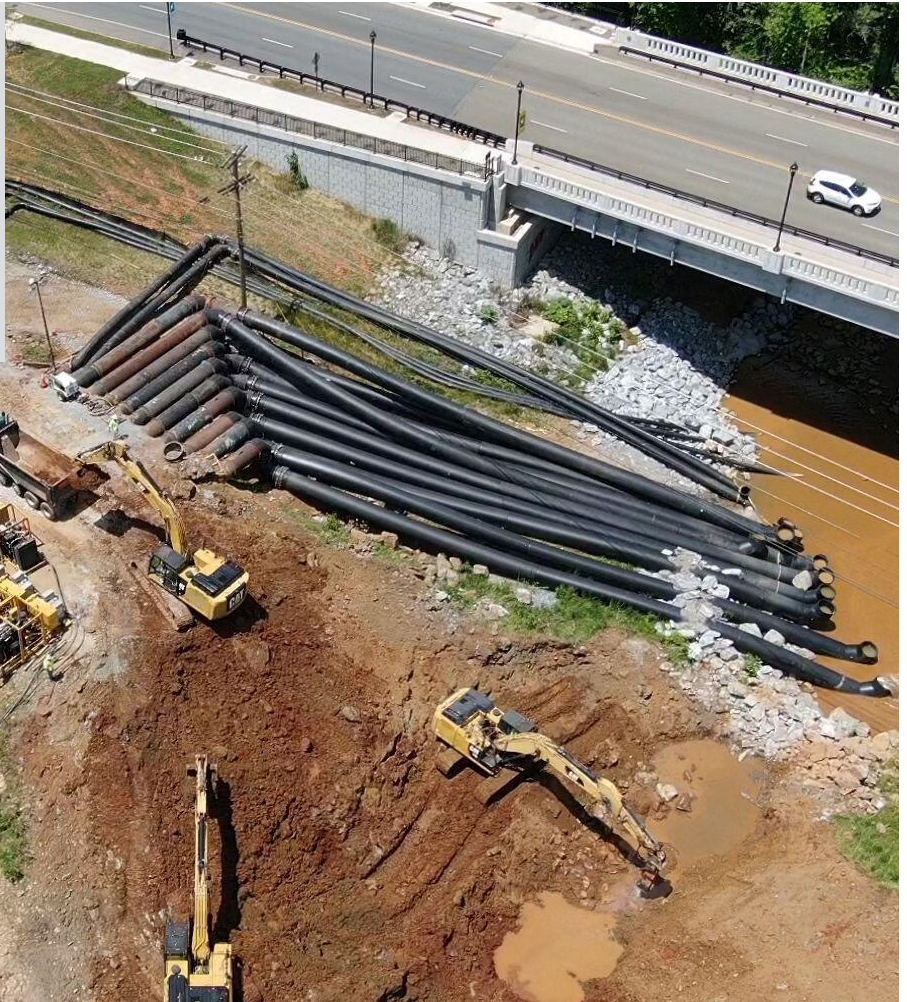
- 10 MWI Hydraflo™ 42" pumps driven by 10 MWI 4200D drive units capable of moving up to 55,000 GPM per pump
- 2 MWI Hydraflo™ 24" pumps driven by 2 2400D drive units
- Three 12-inch sound-attenuated end suction pumps with floating suctions to facilitate the initial lake drawdown and minimize sediment transport during the dam breaching
- The comprehensive setup also included 3,000 feet of steel and HDPE pipe to redirect water and prevent downstream erosion

CURRENT STATE OF DAM INFRASTRUCTURE IN THE U.S.

There are approximately 90,000 significant dams in the United States. According to the U.S. Army Corps of Engineers, at least 4,000 of these dams are in poor or unsatisfactory condition, posing a risk to both human life and the environment if they were to fail. Many of these dams are considered unsafe, deficient, aging, or deteriorating and require inspections, upgrades, emergency repairs, or even decommissioning. The average age of dams in the U.S. is 61 years, and by 2025, 73% of dams in the National Inventory of Dams will be over 50 years old. The estimated cost to rehabilitate non-federal dams across the nation is \$157.5 billion, with \$34.1 billion required for the most critical dams in need of immediate attention.

EQUIPMENT

- 10 - 42" HAC342 Hydraflo™ Pumps
- 2 - 24" HAC324 Hydraflo™ Pumps
- 10 - 4200 Diesel Drive Units
- 2300' of Steel & HDPE Pipe



HIGHLIGHTS

- **Dam Removal:** The dam removal was completed in just four days with crews working around the clock, significantly ahead of the city's projected timeline
- **Pump Efficiency:** MWI Pumps provided a total of 580,000 GPM through its bypass system, ensuring that stormwater was controlled and that the construction site remained safe
- **Infrastructure Improvements:** The lake was drained and replaced by a wetlands park, and a new weir/dyke system was constructed to safely handle future stormwater flow
- **Coordination and Logistics:** MWI Pumps coordinated the delivery and staging of equipment to optimize space at the job site, maintaining workflow efficiency
- **Reliable Equipment:** MWI Pumps delivered 10 Hydraflo™ 42" pumps and 2 Hydraflo™ 24" pumps, with additional equipment, ensuring the bypass system functioned seamlessly

"MWI Pumps worked hand in hand with WMS to provide what the customer needed at the precise time they needed it. The jobsite had a small footprint, so MWI provided expert-level logistics by staggering the arrival of pumps and equipment, allowing them to be arranged before the next scheduled delivery. This coordination kept the jobsite moving efficiently and the water flowing without slowing down the project." - Water Management Solutions, Inc.

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