

MEMORANDUM



TO: VICTOR CARDENAS, CITY MANAGER
FROM: BEN CROY, CITY ENGINEER
SUBJECT: PCCP PIPE INSPECTION AND AFO
DATE: AUGUST 20, 2026

The City of Novi has approximately 5.8 Miles of Prestressed Concrete Cylinder Pipe (PCCP), which is a pipe material used for large diameter water mains in the 1960s and 1970s. The pipe was manufactured by a company long since defunct and has been susceptible to catastrophic failures from manufacturing defects. These kinds of breaks have occurred multiple times on the Great Lakes Water Authority's (GLWA) 14 Mile water main and have impacted the water service of seven communities. These events have helped reinforce the importance of proper inspection, maintenance and monitoring of this type of water main. Following the first series of water main breaks, GLWA and the City of Novi chose an inspection method conducted by Xylem (fka Pure Technologies), which involves passing specialized equipment (Pipe Diver) through the live main to identify specific defects and water leaks. Refer to the attached presentation provided to City Council at the August 12, 2019, meeting for further information regarding this inspection methodology.

Given the most recent breaks GLWA has experienced and the unpredictability of these failures, GLWA has decided to improve on the reliance/resilience by adding continuous monitoring capabilities using Acoustic Fiber Optics (AFO). AFO installed within the water main can detect leaks, wire breaks (the primary indicator of deterioration in PCCP) and identify impact and vibration from construction activities. AFO will instantaneously provide notification of such events through Xylem and a monitoring dashboard available to staff. It provides real-time data of the pipe's condition, and if the data collected raises any concerns, plans can be implemented with the goal of addressing concerns prior to failure of the water main.

Novi's previous inspection completed in 2020 and 2024 (resulting in one complete inspection of Novi's PCCP) identified four specific areas of concern, which were repaired in 2024 using the Carbon Fiber Reinforced Polymer repair method (CFRP). Due to the growing concern regarding the viability of the existing PCCP main, installation of the AFO in the larger 36 and 30-inch PCCP pipe along Novi Road (14 Mile and Grand River which

includes crossing under I-96), would be a proactive approach to avoid major water service interruptions. This concept was discussed at the June 1, 2026, Finance and Administration Committee meeting. Staff were already in contact with Xylem after the GLWA breaks in fall of 2025 and spring of 2026 and began to develop a scope to install AFO. Xylem has provided the attached proposal for installation of 3.4 miles of AFO followed by continuous monitoring over the next ten years. Xylem offered two payment options; 1) purchase of the AFO equipment, with annual fees for monitoring and equipment warranty, or 2) leasing of the AFO equipment that covers all maintenance, monitoring, and warranty work. This second option avoids purchase of equipment which will eventually be obsolete and is the preferred option.

Prior to the AFO installation, the PCCP pipe will be inspected using the Pipe Diver. Reinspection is necessary to establish a baseline condition status prior to beginning the monitoring period. Another insertion point will need to be installed for the Pipe Diver, involving the replacement of an existing valve with a compatible tee/valve. This work can be done as part of the ongoing valve maintenance program already in progress. The pipe reinspection is ~\$750K and the leasing of the AFO is ~\$300K per/year for 10 years, so the total cost in year 1 is ~\$1M. An agenda item for this recommended program will be on the August 31, 2026 City Council Meeting for consideration.