

TOWN OF IPSWICH UTILITIES DEPARTMENT



272 HIGH STREET • IPSWICH, MA 01938 • (978) 356-6635 • FAX: (978) 356-6634

MEMORANDUM

To: Board of Water Commissioners
From: Vicki Halmen, Water & Wastewater Director
Subject: Update on Hood Farm Road Area Hydrant Flushing
Date: July 3, 2019
CC: Town Manager, Water Subcommittee

Background

This purpose of this memorandum is to provide an update on the Hood Farm Road area hydrant flushing issues described in a June 16, 2017 memorandum to the Board of Water Commissioners. Since 2015, the Water Department has been investigating the impacts of its annual flushing program in the area near Hood Farm Road (west of Route 1). Ongoing resident issues related to flushing activities, such as low water pressure and air entrapment in water pipes, led the Water Department to commission a study evaluating the water system in this area. The study included targeted flushing activities to gain information on system hydraulics (e.g. system pressures and observed flows) and a hydraulic model to determine what system modifications, if any, may improve the hydraulics in the area. This study was finalized in July 2018.

As part of the study, the Water Department's consulting engineer New England Civil Engineering (NECE) evaluated the following improvements to address issues during flushing:

- installing new check valves either on Hood Farm Road or at individual properties,
- cleaning and lining existing water pipes,
- installing new water pipes, and
- installing a new water tank.

These options were discussed in detail at the Water and Wastewater Subcommittee on November 8, 2018. As shown in the summary table on the following page, the estimated costs for most of the options exceed \$1,000,000. Members of the subcommittee expressed concern about the state of the water system and advocated for the least expensive option of installing a single check valve on Hood Farm Road for an estimated cost of \$40,000. Before making a recommendation to proceed with the new check valve, the subcommittee asked for the Water Department and NECE to further investigate the hydraulics of this option. The hydraulic model still predicted a significant reduction in water pressure during flushing (67.9 pounds per square inch of pressure (PSI) would drop to 5.2 PSI with a hydrant flowing), so additional fieldwork was needed to evaluate whether area residents would experience any improvements.

Hydraulic Model Analysis - Hood Farm Road Service Area

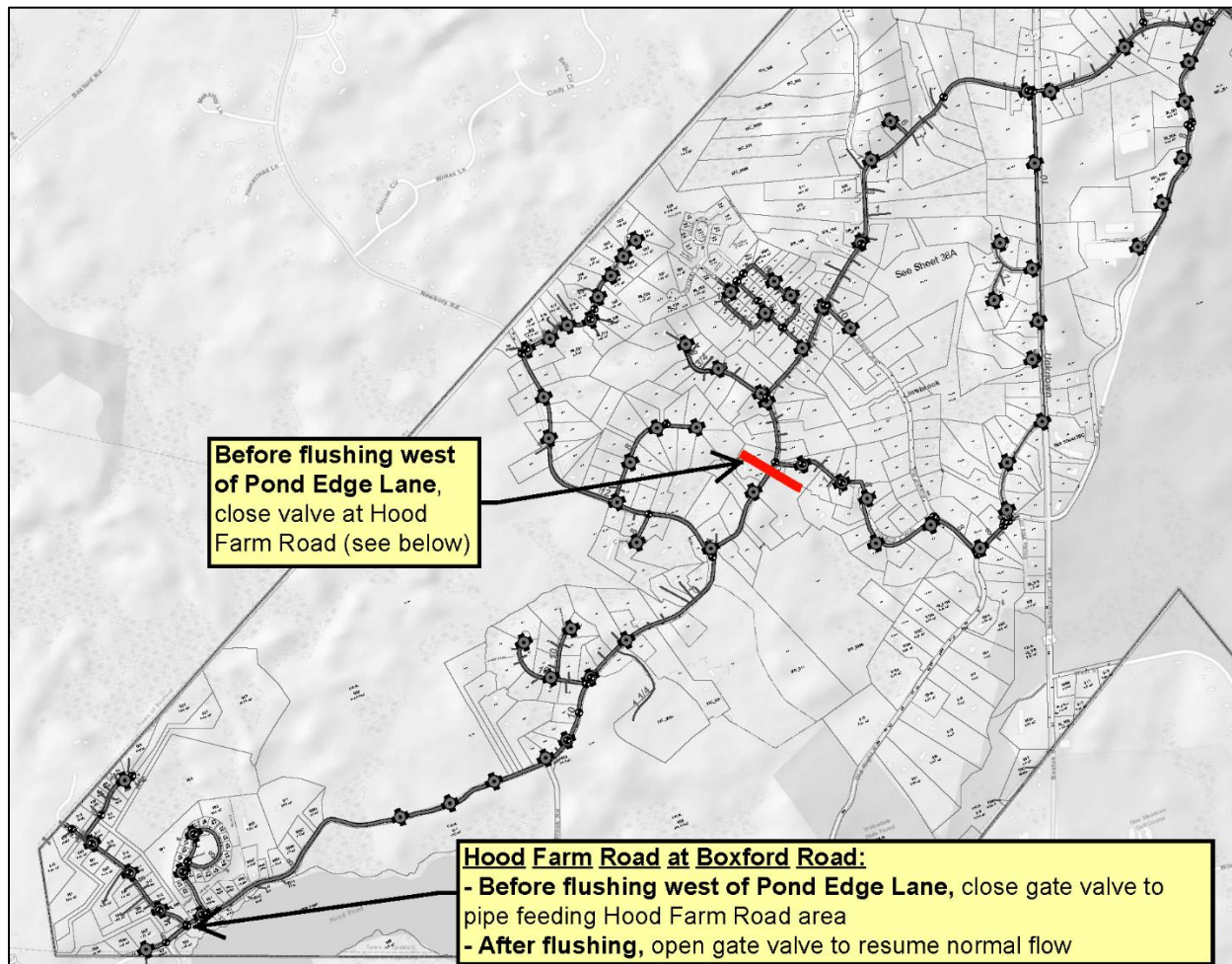
**End of Hood Farm Road
Simulated Fire Flow - 500 GPM @ Linebrook and Boxford Road**

Option	Description	Location	Static Pressure in PSI (without hydrant flowing)	Residual Pressure in PSI (with hydrant flowing)	Estimated Cost
1	New check valve(s)	End of Hood Farm Road, or on individual properties	67.9	5.2	\$ 40,000
1A	Cleaning and cement lining of existing water pipes	Howe Street to Route 1	68.6	22.6	\$ 575,000
1B		Route 1 to Newbury Road	67.6	10.8	\$ 825,000
1C		Howe Street to Newbury Road	68.8	29.7	\$ 1,400,000
2A	New 12-inch water pipes	Howe Street to Route 1	69.5	35.8	\$ 1,165,000
2B		Route 1 to Newbury Road	67.8	17.7	\$ 1,672,000
2C		Howe Street to Newbury Road	69.8	49.9	\$ 2,837,000
3	New 8-inch cross-country connection	Oak Knoll Road - Howard Road	67.6	9.0	\$ 140,000
4	New 8-inch cross-country connection and new water tank	Oak Knoll Road - Howard Road	61.9	44.7	\$ 1,140,000

Summary of May 2019 Field Investigations

The Water Department completed field investigations during the annual hydrant flushing program on May 6 and 7, 2019. In order to simulate the installation of a new check valve, the Water Department closed the main line gate valve at the intersection of Hood Farm Road and Boxford Road while flushing hydrants west of Pond Edge Lane. The purpose of this exercise was to prevent water from flowing out of the Hood Farm Road area water pipes during flushing. (However, pressure will continue to drop in the water pipes behind the closed valve since no water will flow back in from the system through the closed valve.) The Water Department's crew completed fieldwork during off-peak water usage between about 8:30 PM and 11:00 PM each evening. Below is a map showing the fieldwork locations.

Map of Fieldwork Activities – May 6 and 7, 2019



Conclusions and Recommendations

Despite closing the main line gate valve, at least one resident on Hood Farm Road reported similar issues as those experienced during previous hydrant flushing programs. A datalogger installed by the Water Department near #11 Hood Farm Road also demonstrated a large drop in water pressure during flushing, supporting these observations. This indicates that installation of a new check valve on Hood Farm Road would not be an effective solution to prevent low water pressure or air entrapment in water pipes during flushing. Therefore, this valve should not be installed.

Since the water distribution system in this area is a dead-end (i.e. not looped with other water pipes), water quality and pressure issues cannot be avoided without major capital improvements. Customer issues in this area are isolated to the annual flushing program, however, it is acknowledged that the water system does not satisfy fire flow requirements. Regular water system pressures near Hood Farm Road range from about 60 to 70 PSI, which are within the normal operating range for domestic supply needs. We propose ongoing monitoring of this location during annual hydrant flushing activities, and plan to incorporate future upgrades in the Water Department's long-term asset management plan.

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