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CITY OF GARDNER
MASSACHUSETTS 01440-2630

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CITY COUNCIL



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WARD 3 COUNCILLOR
Nathan R. Boudreau

WARD 4 COUNCILLOR
Karen G. Hardern

WARD 5 COUNCILLOR
Aleksander Dernalowicz, Esq.

September 2, 2021

CITY COUNCIL INFORMAL MEETING

Date: Tuesday, September 7, 2021
Time: 6:45 P.M.
Location: City Council Chambers, Room 219, City Hall

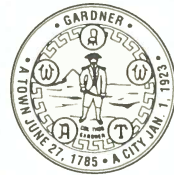
AGENDA

Informal Meeting regarding Water Main Breaks of August 3, 2021

CITY COUNCIL OF GARDNER
Elizabeth J. Kazinskas
ELIZABETH J. KAZINSKAS
Council President

NOTICE: The listing of Agenda items are those reasonably anticipated by the Chair which may be discussed at the meeting. Not all items listed may in fact be discussed and other items not listed may also be brought up for discussion to the extent permitted by law.

City of Gardner, *Executive Department*



Michael J. Nicholson, Mayor

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August 18, 2021

Hon. Elizabeth J. Kazinskas, City Council President
And City Councilors
Gardner City Hall, Rm 121
95 Pleasant St
Gardner, MA 01440

RE: Request for Informal Meeting regarding Water Main Breaks

Dear Madam President and Councilors,

I am writing to request that the City Council hold an informal meeting to allow members of the Administration to present information to the City Council and members of the public regarding the large water main break of August 3, 2021.

The presentation would be conducted by myself, along with the DPW Director, City Engineer, and Fire Chief to provide a full synopsis of the events that occurred that day, its full impact on the city, how the situation was handled, and what has been done since to prevent this situation from occurring again in the future.

Respectfully Submitted,

Michael J. Nicholson
Mayor, City of Gardner

Mayor

From: Dane Arnold
Sent: Tuesday, August 10, 2021 9:43 AM
To: Mayor; Elizabeth Kazinskas; Titi Siriphan; James M. Walsh; Councillor R Cormier; Nathan R. Boudreau; Councillor K Hardern; Judy Mack; Councillor S Graves; James Boone; Craig Cormier; George Tyros; Alek Dernalowicz
Cc: Rachel Stephano (Mayor's Office); Colin Smith; Chris Coughlin; Mike Thompson
Subject: water break update

Good morning,

I would first want to invite anyone to come down to the Department of Public Works and have a discussion looking at the Water Map. It may be a lot easier to see what happened and why looking at a plan versus reading in an email and trying to picture the event.

As you all are aware the City experienced 3 simultaneous water breaks Tuesday morning around 10:30 am. This break was caused by a “water hammer” that occurred when a hydrant at the skating rink was closed during a Fire Department Training exercise. Water Breaks are not uncommon in any water system when a hydrant is closed, but usually they will take place on 1 water main and can be isolated fairly quickly.

There were several compounding circumstances that were going on in the water system that ultimately caused the 3 breaks. We have the largest water main replacement/installation project going on probably since the original water mains were installed back in 1888-1913. Because of the project, we have a few water mains that are “dead ended” because we have gates closed and the contractor needs to “tie in” to our existing system. One of the dead ends as located on Central Street at Maple Street. This is exactly where break #1 took place. The water hammer traveled down the main from the rink, hit the dead end and blew out the old water main on Central St. The second break blew out an old fire hydrant service at the high point of Central Street near Green Street. The 3rd break occurred on Barthel Ave near Baker. This break occurred on a pipe that is old and had a large rock located under the pipe when it was originally installed in the 60’s. Over time it rubbed on the exterior of the pipe for 60 years and the water hammer finally caused it to rupture.

Typically, the Water Department can isolate and shut down water breaks within a few hours of notification, as was the case at Barthel Ave and Central Street near Monument Park. However, the break on Central Street near Green Street involved trying to isolate it using gate valves that were installed between 1888 and 1910. These are the some of the mains and gates were are currently being replaced under our Water Main Replacement Project. These gates would not operate and the water could not be shut off. To make matter worse, the location of the break was in the direct flow path from the 2 – 2 million gallon storage tanks located up on

Reservoir Hill. The City had no way of preventing water from flowing out of the broken pipe on Central Street with the existing gates and locations.

We quickly called HydroTech, who has the ability to install a 16" gate, called an Insertion Valve, on a water main while the water is still flowing in the pipe. Revoli, the contractor for the water project started to excavate where we needed to install this Insertion Valve on Green Street. Simultaneously, the City's Water Department and Highway Department were making the repairs on Central Street at Monument Park and we hired NuDrain to fix the water break on Barthel Ave. The repairs on Central Street and Barthel Ave were made within 6+/- hours. However, the water continued to flow out of the break on Central Street until approximately 2 am (15+/- hours) when the insertion valve was installed.

Once the Insertion Valve was installed, we were able to stop the flow from the Central Street hydrant break. Meanwhile, as hard as Crystal Lake Water Treatment Facility was producing water and sending it up to the tanks, we were slowly losing water from the system at the Central Street break over the course of the day. With the Insertion Valve in and off, we were able to start filling the tanks on the hill. The tank levels are usually between 20' and 25'; we reached a low elevation of 8.5'. We lost 3.9 Million Gallons during this event.

Now that the Insertion Valve (\$30,500) was in, the contractor made the repair to the hydrant service within an hour. However the entire water system that is fed from the 2 concrete storage tanks on Reservoir Hill was out of water. It was a City Wide water shut down. The only water residents had was what was available in the pipes themselves. The only pressure that was in the system was given from the elevations within the system itself, not the tank levels. The higher elevation lost water in their entirety almost immediately (Carlson Lane, Washington Hill, Leo Drive to name a few). Parker Hill and Bickford Hill are on the High System, which is fed from the elevated storage tank on Rt 140, and probably didn't even realize there was an issue. We had to shut off the Snake Pond Well once the valve was installed because it would have pressurized the system to the point it may have started to blow residents internal plumbing/fixtures due to sending water toward pipes where the valves were closed to shut off water to the large break.

The image below shows a black line which is the area that was not receiving water once the valve was installed.

The pink hatched line are the mains that were shut off and isolated the entire City from receiving water.

The Green "X's" are Valves that would operate.

The Black "X's" are valves that would not operate.

The Blue "X" on Green Street near Heywood Street is the new Insertion Valve.



As time went on over the course of the night and people used the water in the system, more and more people lost water or pressure. Once the break was repaired at the hydrant, the Water Department started to slowly return water service to the system. This had to be done very carefully because there are many areas in the City that have air pockets in the mains and there is no way to know exactly where every pocket is located. So we opened hydrants at the high points of the city and slowly opened the gates to introduce water back into the system . As we were doing this, 2 more breaks occurred in areas we have had breaks in the past; Pleasant Street near the new bridge and Way St. We were able to isolate these breaks and hired NuDrain and Dave Richard Excavating to make these repairs while we continued to restore service to the entire City. Several hours went by as the water poured into the pipes to fill the system before we finally saw water come from the hydrants. One by one, each hydrant had water flowing until the system was restored around 6: am Wednesday morning.

So now you know what cause and the event as It happened. How can we prevent this from happening in the future?

Immediate action is to have the Fire Department Train on the High System until the Water Project is complete. This part of the water system we should be able to isolate without impacting the entire City if there is a break. The Fire Department communicates very well with emails to the Water Department on when they are doing training and how much water they use. This particular day an email was sent to the Water Department, but because we are working on the water main project, we did not read the email until it was too late. Moving forward, phone calls and emails will be made to determine if it is ok for the FD to do training exercises.

More importantly, some of the valves that didn't work are part of the current Phase II Water Project. This will give us the ability to isolate a break in this area. We also need to make more improvements over and above the current project to insure this doesn't happen again. This will include installing a new transmission main and gates from the Crystal Lake Water Treatment Facility to the Water Tanks along with several other troubled areas in the City with old water mains. This is not part of the current \$11 million Loan. We are in the process of soliciting a design cost for this work. Best case, we can have design plans ready and if the Infrastructure Bill is passed, have "Shovel Ready" projects ready and paid for using Federal Funds. Worst case is we have to pay for the improvements out of Water Rates and study if the current rates can carry the loan structure of the project.

If you have any questions or want to meet with us in my office, please feel free to reach out.

Thank You,

Dane E. Arnold, Director

Department of Public Works

50 Manca Drive

Gardner MA 01440

978-630-8195