



## Executive Summary

During the early morning hours of October 1, 2007, the District of Columbia Fire and Emergency Medical Services Department (FEMS) responded to a fire in the Adams Morgan area of the District of Columbia and reported that a lack of water supply and low pressure impeded fire fighting. On October 4, 2007, the DC WASA Board of Directors directed that areas served by small diameter water mains (8-inch diameter and smaller) be evaluated relative to fire flow availability from other mains in the system. The report was to be completed in one month. The directive also included another more comprehensive study to be completed in coordination with FEMS and other agencies.

As requested by DC WASA, the “Evaluation of Small Diameter Water Mains – Fire Flow Analysis” report was prepared and includes the results of a fire flow analysis of the public water system. Existing hydraulic models of the water distribution system were used to perform a system-wide review. It should be noted that the hydrants are currently not included in the models but fire flow capacities were computed in the models at each of the over 34,000 junctions / nodes distributed throughout the entire water system. This analysis provides a conservative distribution of fire flow coverage in the system (see Appendix B for Hydraulic Analysis and Appendix D for Definitions).

The fire protection guideline criteria used for the analysis was based upon benchmarks of other utility water systems for various land use classes and as directed by DC WASA in the absence of other criteria in the DC Code. Section 2 of the report includes details related to the Fire Protection Guidelines. These guidelines specify a minimum fire flow availability of: 1) 1000 gpm within a 1000 foot radius of all portions of the water system with public fire hydrants; and, 2) 2000 gpm within a 1000 foot radius of those areas of the water system with public fire hydrants based on land use classification fire flow requirements.

The Hydraulic Analysis Summary is presented in Section 3. Based upon the hydraulic analysis and results from actual fire flow tests performed by DC WASA, only three locations were identified where the DC WASA water distribution system does not provide the specified minimum fire flow as stated above. The three locations described in Section 3 are:



- Location 1 – The westerly portion of Mayfair Parkside, NE
- Location 2 – The westerly portion of Poplar Point , SE
- Location 3 – Ft Stanton Reservoirs, SE

Of these three areas, only one, Mayfair Parkside, N.E. is a populated area. The other two locations are not currently developed and are therefore not of immediate concern.

It was identified that within 2,200 feet of the westerly portion of the Mayfair Parkside location there is adequate system fire flow availability. A map showing the location of high flow hydrants at this location has been provided to FEMS (Appendix E). In addition to providing the map for FEMS pre-fire planning use, the Mayfair Parkside area is being assessed on an expedited basis. If it is determined that physical modification to the water distribution system for this area is required (e.g. cleaning and lining of existing water mains or replacement with new or larger mains) DC WASA will expedite the construction of the modifications.



DC WASA will continue to review with FEMS water system hydraulic capacity at the other identified locations utilizing maps identifying high flow hydrants. This will be done throughout the District so that the best available information can be used by FEMS for pre-fire water supply planning for all areas.

The study shows that the existing water distribution system provides significant fire flow availability throughout the District, as shown on the included maps (located in Appendix B) identifying available fire flow. FEMS and DC WASA must continue to work together and share information concerning system hydraulic capacities.

In addition to meeting with FEMS, DC WASA will continue to perform regular field flow tests at the three locations identified herein and any other areas of concern identified by FEMS to determine the actual fire flow capacities available.

Also, as part of this analysis, locations where the available fire flow is less than the potentially needed fire flow of 3,000 and 3,500 gpm were identified. As a practical matter, small diameter water mains cannot provide fire flows above 3000 gpm. Thus system analysis for large flows in this range was not



part of the initial study directive. However, with this information available, DC WASA and FEMS should perform a coordinated review on a site specific basis to determine the actual site specific NFF's and determine pre-fire water supply planning by FEMS that can immediately provide the fire flow rates needed.

In summary, based on this analysis, there is not a need to expedite a city-wide small diameter water main replacement program for purposes of providing adequate fire flow. However, the small diameter water main program is being assessed in cooperation with FEMS and will be modified as appropriate.