



## Technical Memorandum

**Date:** February 24, 2020

**Project:** 20-2737.0403

**To:** Mr. Tony Doran, Engineering Associate  
Ms. Kim McMillan, PE, City Engineer  
City of Tualatin

**From:** Brian Ginter, PE  
Claire DeVoe

**Re:** Water System Capacity Analysis – Hedges D Development



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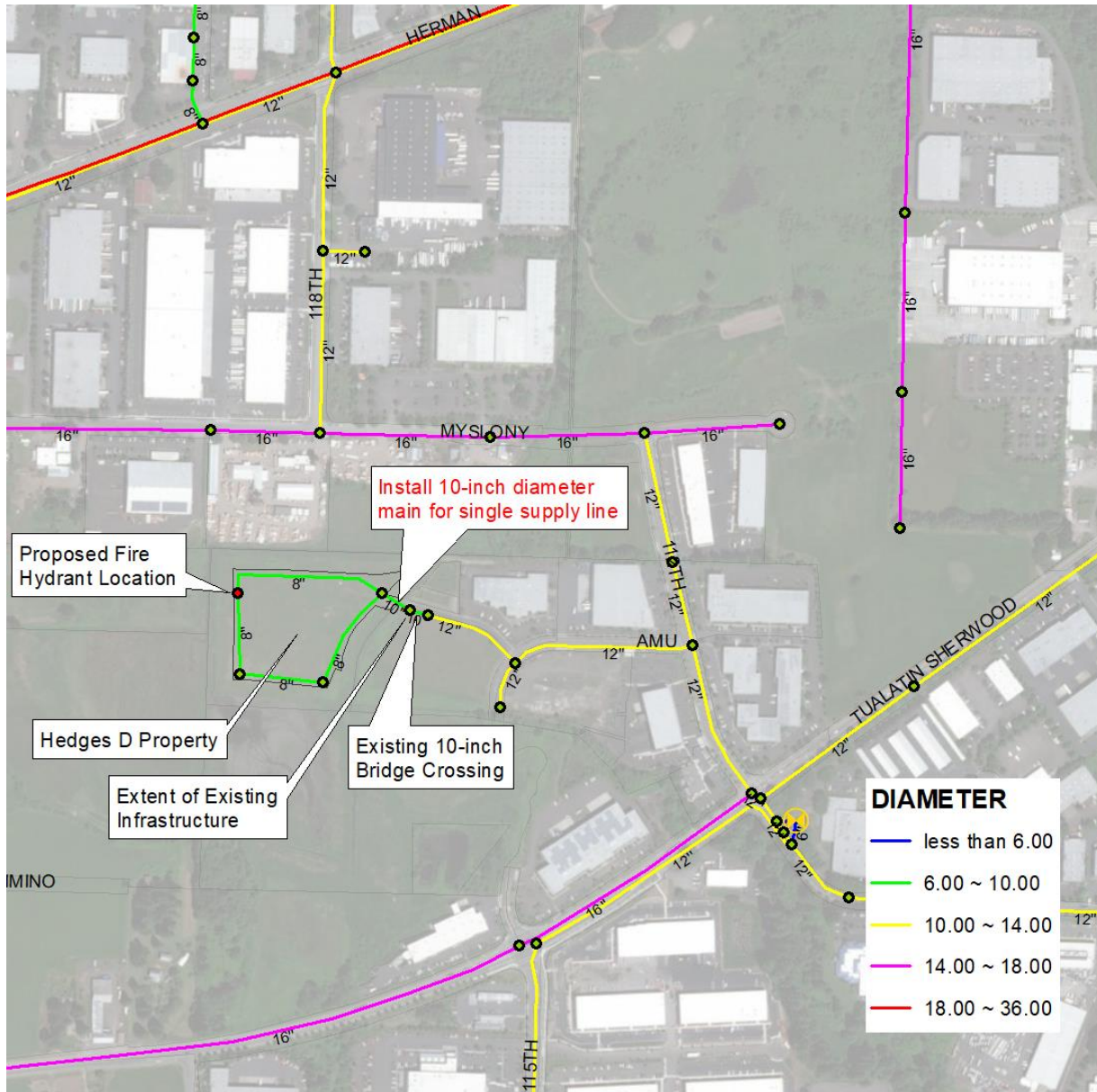
### Introduction

As requested, this memorandum has been prepared to present the findings of our analysis of the water service to the proposed Hedges D Development, located at the existing terminus of the Private Drive near SW Amu St. This memorandum presents the findings of this analysis for the City's use in determining the water system improvements necessary to meet fire flow and pressure requirements.

### Background

The City's water system hydraulic model was used to perform a hydraulic analysis of pressure and fire flow performance in the City's water system under maximum day demand conditions with fire flow events evaluated at the site. The model was updated to include the existing 12-inch diameter mains connecting Myslony St and 112<sup>th</sup> Ave, the 12-inch diameter main on Amu St, and the 12- and 10-inch diameter main in the Private Drive. Onsite piping was added in the model per the Utility Plan provided by Mackenzie including a proposed 8-inch diameter main looping the buildings and a proposed 8-inch main connecting back to the existing main in the Private Drive. The looping supplies a fire hydrant at the northeast corner of the property.

The proposed development is a set of two buildings for light industrial, office, and storage use. The proposed development is located within the City's existing Pressure Zone A, served by the A level reservoirs at a nominal hydraulic grade of 296 feet above mean sea level (msl). Figure 1 illustrates the development site, adjacent water system infrastructure, and the location of the modeled fire flow tests.



**Figure 1. Proposed Hedges D Development Site and Water System Infrastructure**

## Analysis and Findings

The hydraulic model was updated as described above and fire flow performance tested at the proposed onsite fire hydrant location (shown in Figure 1).

A summary of specific model conditions for this analysis is presented below:

**Demand Conditions:** 2030 Maximum Day Demand

**Fire Flow:** 1,500 gpm

**Physical Condition:** Existing facilities plus proposed connection

Fire flows were modeled at the northeast corner of the property. The proposed piping condition, fire flow capacity tested, and the calculated minimum pressure within the area influenced by the fire flow in Pressure Zone A are summarized in Table 1 below:

**Table 1**  
**Fire Flow Analysis Results**

Fire Flow Test	Pipe Condition	Static Pressure (psi)	Residual Pressure at 1,500 gpm (psi)	Available Fire Flow at 20 psi <sup>1</sup> (gpm)
1	All proposed 8-inch	51	38	1,500
2	Proposed site looping 8-inch, pipe prior to split upsized to 10-inch	51	39	2,400

1. Flows additionally limited to 10 fps in pipes, per Water Master Plan criteria.

Based on the findings of this analysis and a review of overall system improvement needs presented in the Water System Master Plan, *the proposed 8-inch diameter main connecting site looping to the existing main in the Private Drive should be upsized to 10-inch diameter to adequately serve the Hedges D Property. If the required fire flow exceeds 2,400 gpm, additional upsizing may be necessary for the existing Private Drive main.*

Currently, there is limited looping in the immediate area. When Amu St is developed south to Tualatin-Sherwood Road and the pipe is looped back to distribution, available flows should improve. However, the timing of this improvement is unknown, and not significant enough to maintain the 10-inch diameter in the Private Drive as the sole feed to the proposed development for fire flows greater than 2,400 gpm.

It is the developer’s responsibility to size internal (private) fire and domestic mains for adequate service pressure, private hydrants and fire suppression sprinkler systems as these facilities are outside the scope of this analysis.

Please do not hesitate to contact us if you have any questions or comments in this regard. We would be happy to meet with you personally to discuss the findings presented in this memorandum.