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Operations Engineering - System Planning and Analysis



Feeder Line 36 Replacement Size Analysis

	<i>Initials</i>	<i>Date</i>
System Analysis Performed by: Mike Platt	<u>MWP</u>	<u>7/11/12</u>
Director of Operations Engineering: Brad Hasty	<u>BH</u>	<u>7.11.12</u>
General Manager of Engineering: Kim Blair	<u>CKB</u>	<u>7/11/12</u>

Feeder Line 36 Current Sizing Summary

Analysis Performed by: Mike Platt

Scope

In 2013 Questar Gas plans to replace approximately 10 miles of Feeder Line 36 (FL36). This analysis determines the appropriate diameter(s) for this replacement. Figure 1 is a map of FL36.

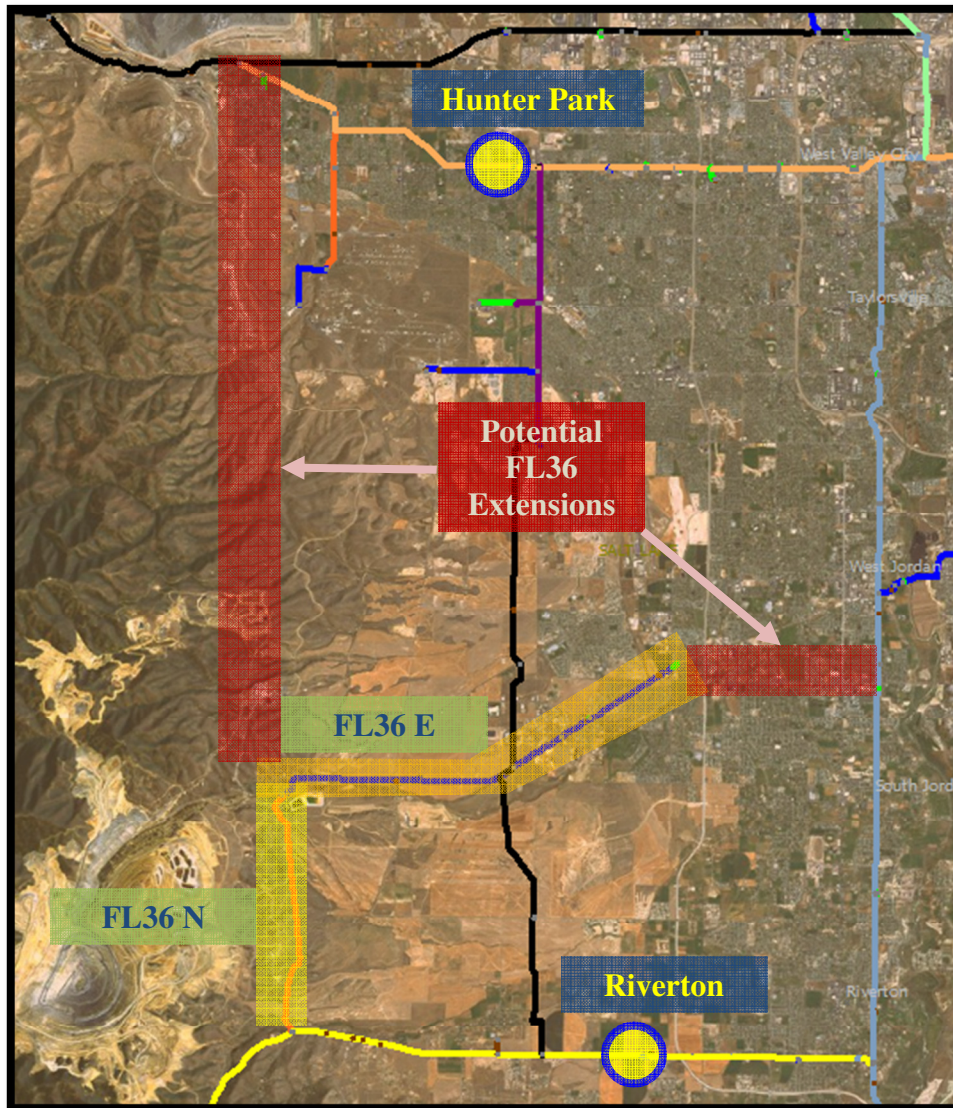


Figure 1: Map of FL36 and Potential Improvements

Analysis

The feeder line was split into two sections for this analysis: the east / west flowing portion (FL36 E) and the north / south flowing portion (FL36 N). Each section will have a distinct purpose in the coming years. The FL36 N segment will eventually be extended along the west bench of the Salt Lake Valley. FL36 E will likely be tied through to Feeder Line 34 (FL34) to provide higher average pressures to West Jordan as well as create a more operationally flexible system.

A previous analysis considered the merits of increasing the diameter of FL36 E (Mathis 2012). The analysis found that the benefits of such an increase were marginal. Pressure improvements are localized to West Jordan, while all other system pressures would remain unchanged. The appropriate replacement diameter of FL36 E is 6-inch as long as the tie from FL34 is made. If the tie is not made a larger diameter replacement would be appropriate.

The west bench is expected to experience significant growth in the foreseeable future. Kennecott Land (Kennecott) is planning a development that will span the entire west bench and is expected to have over 200,000 homes built. This analysis utilizes the available area method¹ of approximating the potential demand of this development. The demand was determined to be 105 MMcfd.

An Unsteady-State 2020 Master Planning Model was used to determine the impact of different replacement diameters for FL36 N. Two considerations for the replacement diameter are the potential impact on the system-wide high pressure (HP) system and the local ability of the line to feed the development build out demand. Figures 2 and 3 display the 2020 results for these two considerations.

The global HP system is virtually unaffected by the replacement diameter of FL36 N during normal operation, while the local HP system requires 12-inch or larger to feed expected growth. The results, shown in Figure 2, the different diameters considered do not vary more than 1 psig regardless of the selected diameter due to the relative location with respect to gate stations and trunk lines. The expected pressures on the west bench, shown in Figure 3, do not fall below 200 psig in 2020 if a 12-inch replacement is chosen. Replacement diameters smaller than 12-inch are unable to feed the expected growth on the west bench and pressures are expected to fall below 125 psig.

1 - The available area method of approximating growth utilizes the known area of development to determine the anticipated demand from a statistical analysis of similarly developed areas.

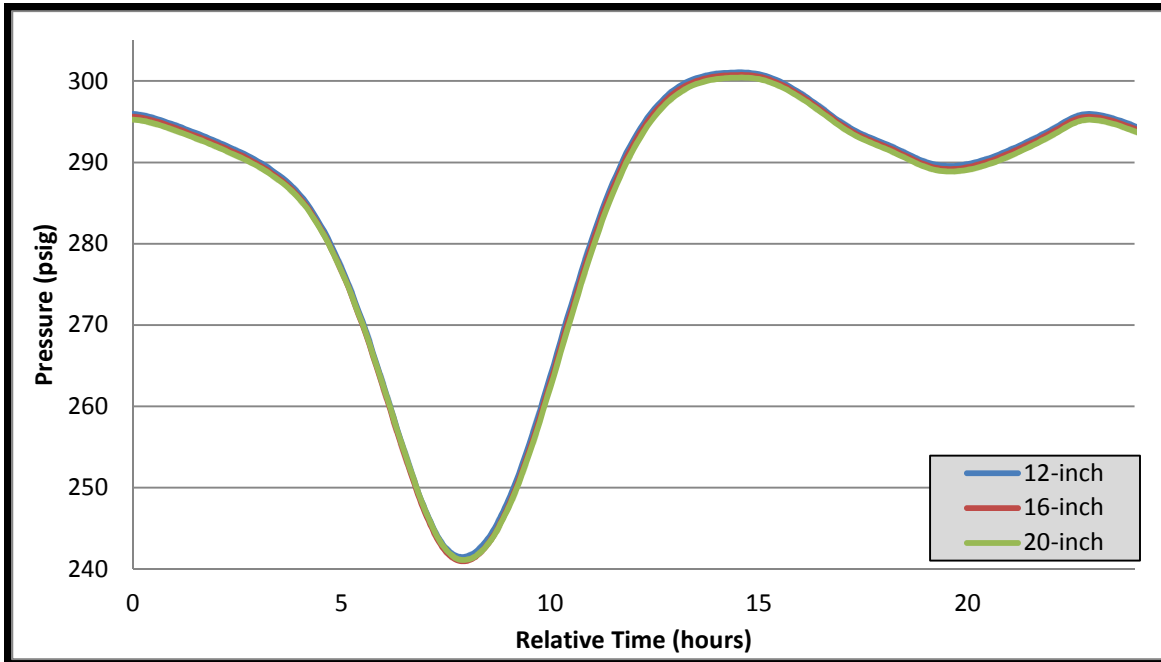


Figure 2: 2020 Master Planning Model Results, West Desert Pressures (System)

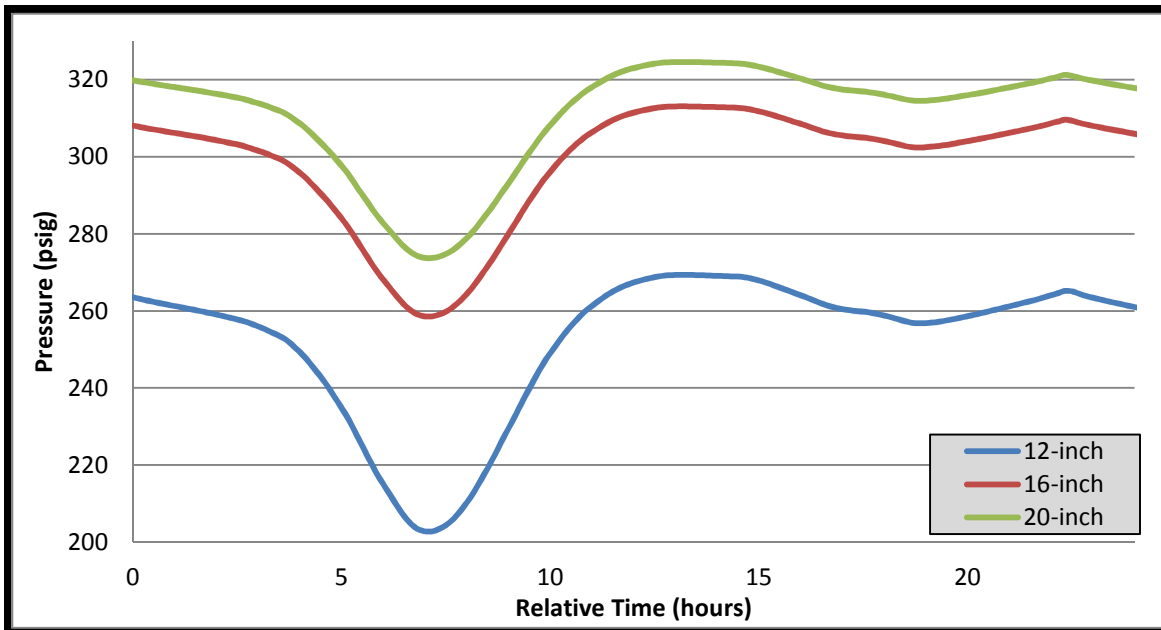


Figure 3: 2020 Master Planning Model Results, Kennecott Development (Local)

Conclusions

The appropriate replacement diameters for FL36 are:

- 12-inch FL36 N (north / south segment)
- 6-inch FL36 E (east / west segment)
 - Requires tie through to FL34