

Green River Pipeline Expansion Analysis

System Analysis: Treenuch Richards, System Planning and Analysis Engineer
Requested By: R. Scott Messersmith & Adam Del Toro

Purpose

As part of the state rural expansion provision, natural gas service is proposed for the town of Green River. A High Pressure (HP) Feeder Line (FL) extension is proposed starting at the northern end of an existing 16-inch PEMC pipeline at the intersection of Power Line Rd and Ruby Ranch Rd to Green River as shown in Figure 1. The existing PEMC pipeline runs Northwest of Moab and could have a Maximum Allowable Operating Pressure (MAOP) as high as 820 psig. The proposed HP FL extension to Green River would run approximately 17 miles. This analysis considers whether a 4-inch, 6-inch, or 8-inch diameter size FL should be installed for the planned route to supply gas to Green River.

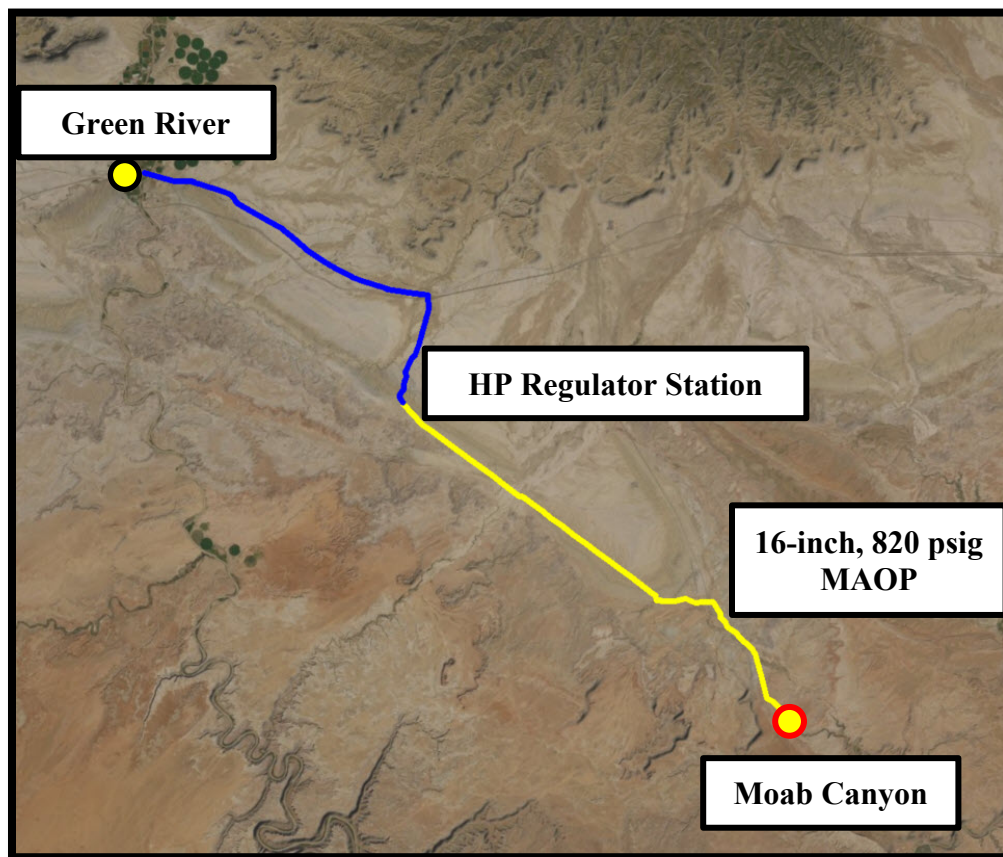


Figure 1: Overview of the HP FL route to Green River, UT

Analysis

An unsteady-state model was used to analyze minimum pressures at the end of the HP FL at Green River for 4-inch, 6-inch, and 8-inch pipe diameters under varying daily demands and operating at a 354 and 720 psig MAOP. Results for these scenarios are shown in Figure 2 and Figure 3.

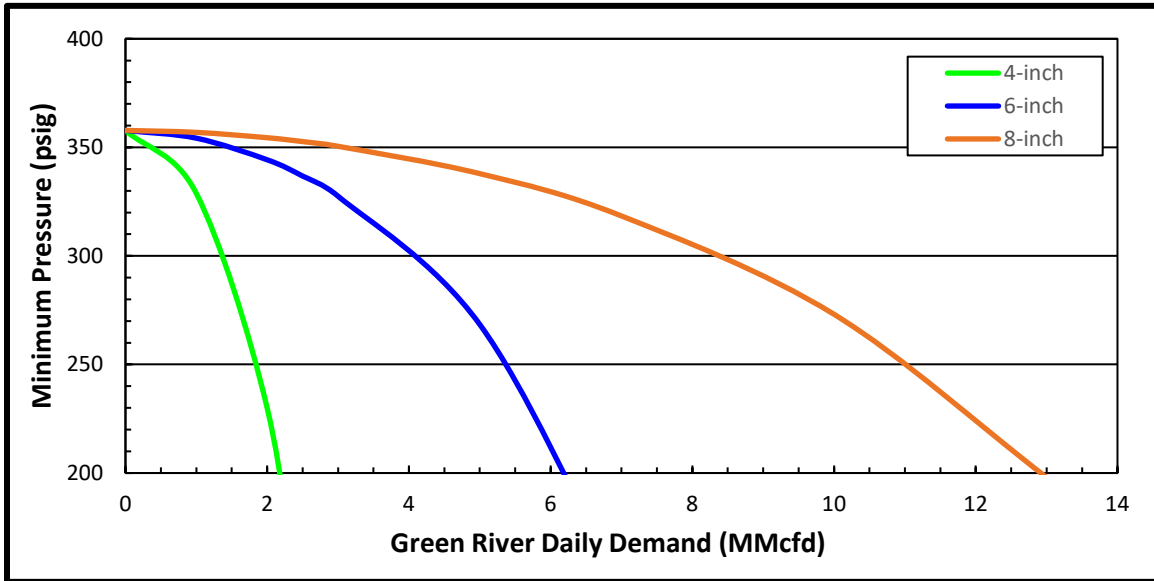


Figure 2: Minimum pressures at Green River for varying FL diameter sizes at 354 psig MAOP

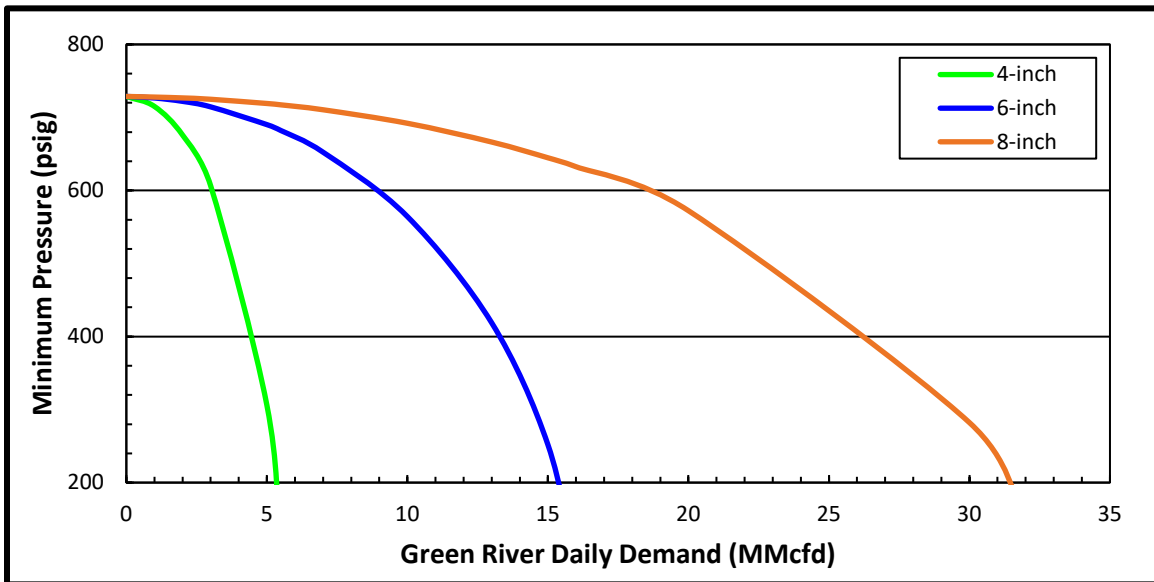


Figure 3: Minimum pressures at Green River for varying FL diameter sizes at 720 psig MAOP

The maximum daily and corresponding peak hour demands that can be provided via the proposed FL diameter sizes before the minimum pressure at Green River drops below 200 psig for 354 and 720 psig MAOP are shown in Table 1 and Table 2.

Table 1: Demand limits for varying FL diameter sizes of 354 MAOP

	Daily Demand (MMcfd)	Peak Hour Demand (MMcfd)
4-inch	2.1	2.9
6-inch	6.1	8.3
8-inch	12.9	17.4

Table 2: Demand limits for varying FL diameter sizes of 720 MAOP

	Daily Demand (MMcfd)	Peak Hour Demand (MMcfd)
4-inch	5.3	7.1
6-inch	15.3	20.7
8-inch	31.2	42.2

Analysis shows that a proposed FL diameter of 6-inch will almost triple the daily and hourly capacity of the line over a 4-inch diameter FL extension. Increasing the design size beyond 6-inch to 8-inch pipe diameter would likely provide excessive capacity for the area's expected short term growth since the potential peak hour residential demand of Green River is currently estimated at 1.2 MMcfd. This demand can be met using a 354 MAOP for the cases shown. While that level of demand wouldn't presently require a 6-inch line, the expansion to this area will likely encourage firm growth, per the original intent of the provision.

If long term growth occurs beyond the limits of using an initial 354 MAOP, the capacity can also be increased to meet the additional high load into the system by increasing the MAOP to 720 psig. This would more than double the listed capacities in Table 1 without a requirement for FL upsizing. Having the additional capacity available will be necessary and ensure DEUWI will not need to incur additional costs to upsize from a minimum diameter size of 6-inch in the future.

Conclusion

The appropriate diameter size for a proposed HP FL extension to Green River under the expansion provision is 6-inch and operating initially at 354 MAOP. This diameter size will be able to provide the potential daily and peak hour residential demand and give the Company necessary flexibility in serving potential future growth for Green River. The proposed HP FL extension could also be uprated to 720 psig MAOP in the future to accommodate long term growth.