

# GREEN MOUNTAIN ENGINEERING, INC.

*1438 South Brownell Road*

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*Williston, VT 05495*

*(802) 862-5590*

February 11, 2021

Ms. Valerie Capels, Town Administrator  
Town of Bristol  
P.O. Box 249  
Bristol, VT 05443

via email

RE: High Lift Pump Replacement  
GME Project No. 4-005

Dear Ms. Capels;

The Town of Bristol has requested that Green Mountain Engineering, Inc. (GME) provide technical assistance pertaining to the replacement of an existing water pump in the Town's water system Pump House. Currently, two high lift pumps exist which pump water from the pump house into the system piping to fill the storage tank. One of the existing pumps is a two and one-half inch diameter Cornell 2 ½ YHB pump and one is a 4-inch diameter Cornell 4YB pump. The Town has inquired if the 4-inch pump could be replaced with a rebuilt 2 ½ -inch diameter pump that is on-site.

GME has researched the project history and reviewed the design calculations associated with the current pumps. These pumps were originally designed by GME and installed by Munson Earth Moving Corporation in 1996 as part of Contract No. 4 of the "Bristol Water System Improvements Project".

GME reviewed the project files and found that the original design called for two identical 2 ½ inch diameter pumps in this location. During the submittal process however, GME staff at that time had extensive conversations with the pump supplier. The pump supplier raised a concern regarding the potential for Net Positive Suction Head conditions for the pump furthest from the Chlorine Contact Tank during times when the pump was drawing directly from the Town Spring. In short, in this circumstance the calculations suggested that a 2 ½ -inch diameter pump may not function at the desired design flow rates. A change order was subsequently signed and the pump for this location was changed to the current 4-inch diameter pump.

Our recent review of the original design found that the design assumptions and resulting calculations used to determine the pump sizing at that time appear to have been conservative. The suction line was assumed to be 400 feet long and the calculations were based on a 6-inch diameter pipe size. The line is approximately 150 feet long in reality and was replaced with a

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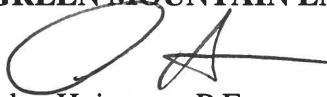
new 8-inch pipe as part of the 1996 Project. These two factors directly impact the design assumption and resulting pump requirements.

We have re-evaluated the pump conditions using the current design information. In summary, the 2 ½ inch diameter Cornell, 2 ½ YHB pump will achieve the desired flow rates and may be used in place of the current 4-inch diameter pump.

If you have any questions, please do not hesitate to call me at my office at (802) 862-5590.

Respectfully,

**GREEN MOUNTAIN ENGINEERING, INC.**



Alan Huizenga, P.E.  
President

cc: VTUMS via email