

## *2 Sewer System Impact Analysis*

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The operation and maintenance of the pool will also require routine backwashing of the filtration system. The backwashing is anticipated to occur twice per month (during the operating season) and will produce 4,000 gallons per backwash. This average daily flow increases the sewer generation 266 gallons per day resulting in a total sewage flow of 2,436 gallons per day.

At the close of the pool season, there will be an anticipated drawdown of the water level within the pool for winterization. The water level will be lowered approximately 14" producing a single discharge of 52,000 gallons. Amortizing this flow to a daily rate increases the proposed baseline an additional 142 gallons per day for a total flow of 2,578 gallons per day

The numbers presented above represent the full build out of the pool facility. However, the numbers should be adjusted to reflect the current baseline usage and backwashing of the pool. The current pool building provides 40 lockers for patron use (800 gallons per day). The current backwash operation occurs weekly and generates 1,600 gallons in two 800 gallon doses (229 gallons per day). The total current sewer flow is 1,029 GPD. The proposed total flow of 2,578 GPD represents an increase of 1,549 GPD over current usage.

Sewage generated at the existing paddle court facility drains to an eOne grinder pump system and is lifted via 1-1/2" forcemain that traverses hole number 5 along the course and into the 8" gravity sewer main. It is the design intent to reuse this forcemain to minimize damage to the course. The maintenance facility will drain via gravity sewer to the pump wetwell and then continue as it does in the pre-development condition.

The existing system should be able to handle the additional flow without capacity issues. This was confirmed with a preliminary meeting with the Department of Public Works to review the project. Additionally, an 8" pipe with a flat slope of 0.50% yields the following:

$$Q_{full} = \left(1.49/n\right)AR^{2/3}S^{1/2}$$

where            Q = flow (cubic feet per second)  
                      n=Manning's roughness coefficient; 0.01 used  
                      A=Area of pipe (square feet); 0.349 square feet  
                      WP=wetted perimeter of pipe (feet); 2.09 feet  
                      R=Hydraulic Radius (A/WP)  
                      S=slope of pipe (feet per foot); 0.005

$$Q_{full} = \left(1.49/.01\right)(.349)(.167)^{2/3}(.005)^{1/2}$$

$$Q_{full} = 1.09cfs$$

$$Q_{full} = 490gpm$$

The proposed sewer usage rate of 2,578 gallons per day with an applied factor of safety of 3 becomes 7,734 gallons per day (5.37 gallons per minute). The increase in flow represents approximately 1% of the pipe's capacity. The increase in sewer flow as a result of this project is minimal and is not expected to have any impact on the Town of Wellesley municipal system.