


City of  
Portsmouth  
*Department of Public Works*



**MEMORANDUM**

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TO: Karen Conard, City Manager

FROM: Suzanne Woodland, Deputy City Attorney  
Terry Desmarais, City Engineer 

DATE: August 20, 2020

SUBJECT: Approach to Project Implementation  
Sagamore Avenue Area Sewer Extension Project

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This memorandum has been prepared for distribution to the City Council to provide information and context in advance of the meeting on August 31, 2020. The City Council must make certain decisions to allow City staff and consultants to move forward with the permitting and design process in the fall of 2020 which will position the City for bidding this winter (when bidding is most favorable) and help to avoid additional delays in Consent Decree milestones for this project.

**Response to Questions and Requests**

The City has conducted recent meetings including a project summary for the City Council on July 13, 2020, a work session with the City Council on July 28, 2020 and a public meeting on August 11, 2020. During the course of these meetings, it was requested that City staff provide more information related to the costs for individual property owners. Those costs are described in Attachment A and include a brochure to be sent to homeowners. In addition, City staff was asked to set forth its reasons for not supporting the installation of Busse Membrane Filtration units at each property. Those reasons are described in Attachment B.

Residents requested that the Environment One (E/One) grinder pump manufacturer/vendor be available for a meeting with the residents to answer questions. The City has coordinated with the vendor, FR Mahoney and Associates, and have scheduled a meeting for August 26, 2020 at 6:30 p.m. via Zoom for this purpose. Following a brief presentation on the system, the vendor and City Staff will be available for questions.

A City Councilor asked about the revenues that might be generated from the new connections. If all customers connected upon completion of construction, revenues might be in the range of \$82,000 annually based on current rates and water usage from properties currently served in the project area.

## **Approaches for Moving Forward**

Moving forward will require the City Council to decide on an approach that will inform the project limits and cost apportionment. Regardless of the selected approach, it is important to keep in mind the following three points:

- (1) No one will be required to tie-in until their existing septic system is in failure, consequently, no property owner is being obligated to spend money ahead of need;
- (2) When a septic system fails, a property owner will be required to tie-in, but if the cost to tie-in is less than the cost of a new septic system, the property owner and the environment will benefit from the ability to connect to sewer (one can safely assume that most new septic systems in the area are likely to cost at least \$20,000 to replace); and
- (3) The application of the December 2019 Cost Proposal to commercial properties can be adjusted to make sure no greater value is received compared to residential property owners.

### **Approach 1**

Full Project Limits Approach: Install public sewer mains to the full project limits (91 connections), commit to the November 2019 Cost Proposal governing the work on private properties and appropriate additional funds necessary to cover all the work.

### **Approach 2**

Alternative Project Limits Approach: Install public sewer mains to the reduced project limits (57 connections) and commit to the November 2019 Cost Proposal. Assuming bids are in accordance with estimates, no additional appropriation of funds would be required for this alternative. This option excludes 34 properties from having a sewer option, and a number have expressed disappointment about this approach.

During the dialogue at the meetings in July and August, it appeared the Alternative Project Limits, while attractive from a cost standpoint, was concerning because it excluded certain parties interested in the project. As discussed, any changes to the November 2019 Cost Proposal will drive the costs up or down depending on the allocation of financial responsibility for the private property work. The preference appeared to be to leave the Cost Proposal as is. Further, it was a concern to the City Council that the exact number of properties that might connect at construction could not be determined through the questionnaire results and there was interest in determining a more accurate cost for the private property owner for their portion of the work. Following the meeting and consideration of these points and concerns, another approach has been envisioned to meet these collective objectives.

### **Approach 3**

Full Project Limits Base Bid and Bid Alternate Approach: Design and permitting would move forward to include the full project limits (91 connections) and all private property work. This would include a design at each private property interested in connecting at the time of

construction. The construction base bid would be to install public sewer mains to the full project limits in the “right-of-way.” The base bid cost estimate at \$4.19M is less than the current funding authorization of \$4.4M. The base bid could be awarded without delay and work in the roadway started. The construction bid alternate costs would include all the private property work to be constructed under the project. This is currently estimated at \$21,000 per connection, including the pump and connection to the house (sewer enterprise fund) and sewer lateral from the grinder pump to the right-of-way (private property owner cost). With bid prices from a contractor, the City could then accurately determine the cost at each property.

With bid alternates in hand, the City Council could:

- (a) Retain the November 2019 cost sharing proposal, obtain final confirmation from property owners of intent to connect, and authorize the funding necessary to complete the private side work as envisioned in Approach 1 but with costs more defined; or
- (b) Adjust the Cost Proposal in a manner that does not require more municipal funding, keeping in mind that the Consent Decree does not require the City to pay for the private side work and that no one is required to connect while they have a functioning system; or
- (c) Fund the private side work over time by setting up a means of identifying and funding first those properties most in need of septic replacement and appropriating more funds at a later date for the balance of properties.

The City and its residents have been discussing the Sagamore Area Sewer extension project since September 2019. While the limits and cost apportionment have been changing, the need for the project remains clear. This project will provide an outlet for existing failed septic systems in an area that has shallow ledge, poor soils and is adjacent to an impaired water body. Converting the septic systems to sewer through the use of grinder pumps has been recommended by the City’s engineering consultant, and is an approach that has been widely used and implemented in New England and in Portsmouth for areas with similar conditions. The existing installation of low pressure sewer systems in the City have been without complaints and City staff have no reason to believe this will be an operation and maintenance burden to the resident. Sending the wastewater to the Peirce Island Wastewater Treatment Facility (WWTF) will result in a higher level of treatment than any on-site option. That being said, there is no obligation to a property owner with a functioning septic system to connect at the time of construction. Given all these facts, City staff recommend moving forward with Approach 3: the Full Project Limits Base Bid and Bid Alternate Approach. This approach will keep the project moving, maximize the limits of the sewer extension, provide accuracy on the costs to the private property owner, and allow the City Council accuracy on the additional bond authorization once actual prices have been obtained. Approach 3 is consistent with the City’s obligations under its Consent Decree and only the construction and completion milestones would have to be adjusted to reflect the later start to the project. Regulatory support for adjusted milestones can reasonably be expected in light of the challenges caused by the Covid-19 pandemic.

## ATTACHMENT A

### **Further Explanation Regarding Costs For The Private Property Owner:**

Assuming the November 2019 Cost Proposal is adopted by the City Council, the private property owner would be required to pay for the cost of their sewer lateral pipe (1 ¼" diameter pipe, 4-feet deep) from the edge of the roadway to the location where the E/One grinder pump is installed. It is estimated that this will cost \$6,600 for the average house, but could range higher or lower depending on yard features (such as a retaining wall, irrigation, or trees) and subsurface conditions (such as the existence of ledge). The attached brochure, which will be distributed to residents, demonstrates how the cost of the service might change given different conditions. We anticipate that the average cost per linear foot will range from \$116 per linear foot to \$187 per linear foot.

Residential property owners will be offered a 10-year, 0% interested loan to cover private sewer lateral costs. This loan would be documented with a promissory note and secured by a mortgage. Should a homeowner take advantage of this offer and the cost was \$6,600, this would result in a monthly payment of \$55.

The City cannot determine the final cost for each property until the design is completed and bids are received from a contractor. It is recommended the City Council move forward with the Full Project Limits Base Bid and Bid Alternate Approach so that these costs can be accurately provided after pricing is received by a contractor. This will require City Staff and engineers to work closely with each property owner to define the layout during design and permitting.

**Innovative/Alternative System Not Recommended For this Project**

A resident has asked the City to consider a Busse Membrane Filtration (MF) system in lieu of the sewer extension. The MF system is intended to enhance septage treatment before it is discharged through the existing leaching field. The benefits include improved water quality over the existing septic system water quality and potentially less overall project cost. The MF system is in effect a wastewater treatment facility in each home, requiring space either inside the basement of a home or in an accessory structure to site the treatment equipment. While the MF system may have appropriate applications in other parts of the City and region, staff does not recommend it for this project as an alternative to sewer line extension. The reasons are bulleted below.

- The MF system would be a greater impact on residential property owners than connection to a sewer main through a lateral and E/One pump. As described above, the MF system is in effect a small wastewater treatment facility. There are a number of properties in the project area that likely could not accommodate this equipment in an existing basement (or would not desire to accommodate this system in a finished basement). The alternative to placement in the basement would be a heated, powered out-building that meets code and property setback requirements. Depending on the location of the treatment system, there may be a need to pump to or from the system.
- Because the system is a miniature wastewater treatment system which concentrates wastewater in order to perform treatment, any malfunction resulting in potential overflow could result in a discharge inside a house. Malfunctions may require the equipment vendor for resolution and it is unknown how quickly they could respond.
- This type of system is complex in its mechanic and electrical components. The proposed E/One grinder pump is a mechanically simple system with a proven track record, including in the City of Portsmouth.
- While initial cost estimates have been provided by the equipment vendor, the needs of the MF system including housing, power, clearance, and other specifics have not been studied for each property and would likely significantly increase the cost of installation. The ownership and operation and maintenance logistics have not been discussed or determined.
- The City's sewer use ordinance, operating budget and fee structure is not currently structured in favor of installation and ongoing maintenance obligations for equipment on private property.
- The level of treatment in the MF system is less than what will occur at the Peirce Island WWTF. Sending wastewater to the WWTF will result in cleaner water discharged to the Great Bay Estuary.
- This alternative system is not consistent with past practice and the sewer enterprise fund model. The City has not previously expended capital funds for work on private property in this fashion. In general, covering the cost of any work on private property is uncommon for public utilities. Proposing to install the E/One grinder pump on private property is unique for Portsmouth because the project is Consent Decree driven. If the cost of work on private property is covered by the sewer enterprise fund, it should only be for connection to municipal infrastructure.

- This project was originally intended to be a sewer system extension. See the Consent Decree Second Modification. Sewer systems are commonly extended in order to convert septic tank discharges when addressing bacteria and other water quality impacts (such as nutrients like nitrogen and phosphorous) near impaired water bodies. This project will address already failed septic system and some properties already using holding tanks to manage waste. Replacement septic systems in this area get complicated due to newer septic regulations requiring separation between the seasonal high ground water table and/or ledge to the bottom of the septic effluent bed. This commonly results in raised septic systems that require a pump in order to discharge and impact property esthetics. Some recent septic system designs for properties adjacent to Sagamore Creek have required aeration of the septic tank resulting in additional costs and operation and maintenance.