



CITY OF
BAINBRIDGE ISLAND

UTILITY ADVISORY COMMITTEE
REGULAR MEETING
WEDNESDAY, MAY 12, 2021
5:30 PM
ZOOM MEETING

THE UTILITY ADVISORY COMMITTEE WILL HOLD THIS MEETING USING
A VIRTUAL, ZOOM WEBINAR, PER GOVERNOR INSLEE'S
"STAY HOME, STAY HEALTHY" ORDERS

PLEASE CLICK THE LINK BELOW TO JOIN THE WEBINAR:

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OR TELEPHONE: 1-253-215-8782

WEBINAR ID: 973 5747 3020

AGENDA

1. CALL TO ORDER / ROLL CALL / ACCEPT OR MODIFY AGENDA / CONFLICT OF INTEREST DISCLOSURE
5:30 PM
2. FERNCLIFF WATER MAIN EXTENSION
3. WASTEWATER TREATMENT PLANT
4. PUBLIC WORKS UPDATE
5. NEXT MEETING AGENDA PLANNING
6. ADJOURNMENT

To: Chris Wierzbicki, City of Bainbridge Island

Date: May 10, 2021

From: Chris Gonzalez, Senior Project Manager
John Ghilarducci, Principal

RE Funding Alternatives for Ferncliff Water Main Extension

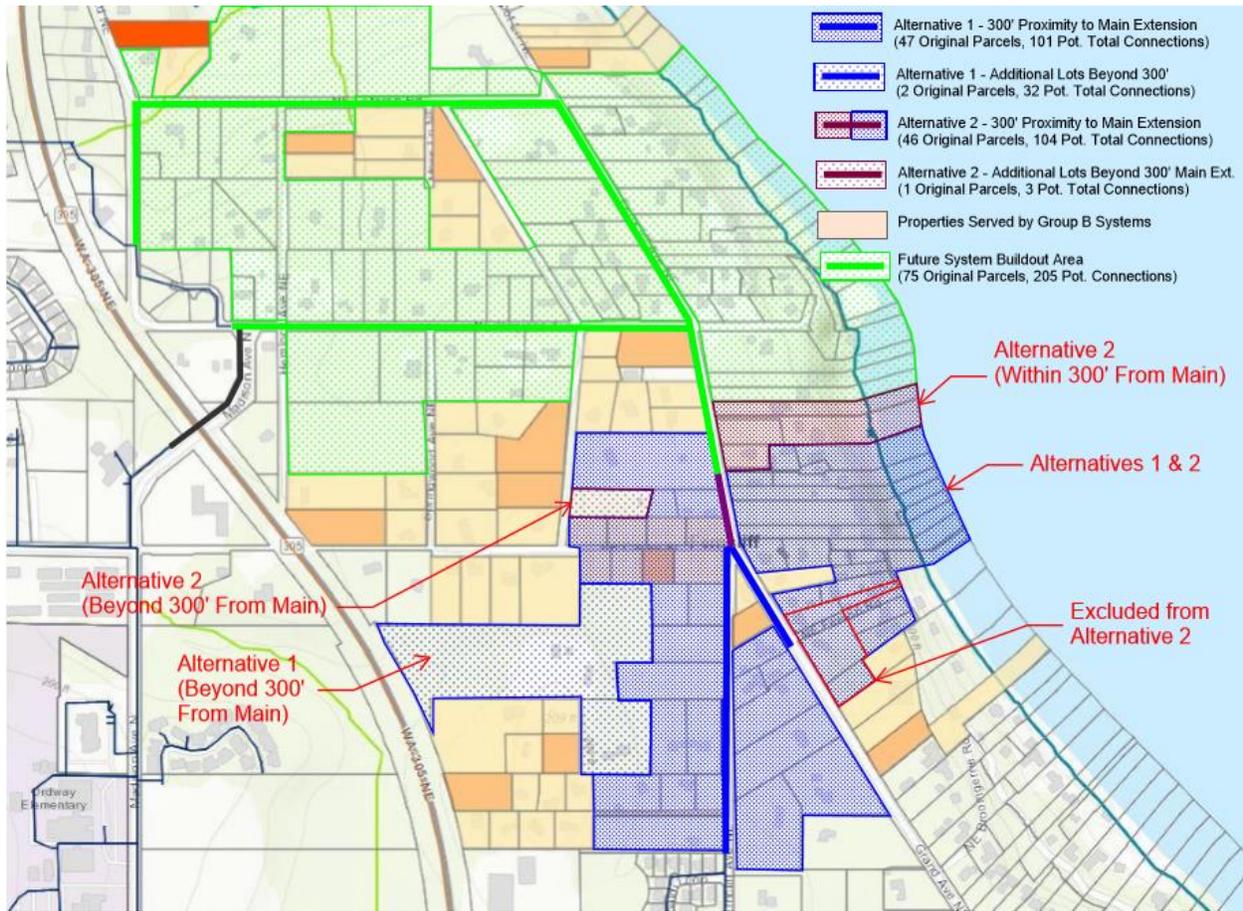
The City of Bainbridge Island's Comprehensive Plan generally calls for managing utility services in an efficient, effective, and safe manner that preserves local water resources. To this end, the City Council asked the City's Utility Advisory Committee (UAC) to "study and recommend a process for facilitating consolidation of small water systems." The UAC released a memo in September 2020 recommending that the City adopt a policy of actively responding to requests for assistance from small water systems on Bainbridge Island and, where appropriate, encouraging voluntary consolidation of those systems into the City's water utility. Bainbridge Island is home to 35 active Group A water systems serving 15 connections or more, as well as 135 Group B water systems that serve fewer than 15 connections.

Ferncliff Water Association, a Group A system with 18 connections, recently reached out to the City and expressed interest in potentially having the City take over its infrastructure. In accordance with the City's pro-consolidation policy, the City has conducted a preliminary assessment of the infrastructure that would be needed to connect the Ferncliff water system (as well as the neighboring Casey Street water system, which serves 9 connections) to the City's water system. The infrastructure needed includes:

- A main extension along Ferncliff Avenue NE that runs north from NE Garibaldi Loop to Grand Avenue NE.
- A main extension and service lines to the homes that will receive service. The City has identified two alternative routes for the extension beyond the intersection of Ferncliff Avenue NE and Grand Avenue NE:
 - » Alternative #1 runs the extension southeast to NE Fenton Road along Grand Avenue NE.
 - » Alternative #2 runs the extension north along Ferncliff Avenue NE.
- A main extension to the Casey Street Water System.

Exhibit 1 provides a map illustrating these alternatives, summarizing the initial estimates of the total cost of the necessary mains and service lines.

Exhibit 1: Estimated Cost of Water System Extension



Alternative #1	Low Estimate	High Estimate
Main Extension (Ferncliff from Garibaldi to Grand Avenue)	\$400,000	\$500,000
Extension & Service Lines (Grand Avenue to Fenton)	140,000	200,000
Casey Street Service Extension	70,000	100,000
Total Project Cost	\$610,000	\$800,000

Alternative #2	Low Estimate	High Estimate
Main Extension (Ferncliff from Garibaldi to Grand Avenue)	\$400,000	\$500,000
Extension & Service Lines (Ferncliff)	100,000	150,000
Casey Street Service Extension	70,000	100,000
Total Project Cost	\$570,000	\$750,000

The City has several options for recovering the cost of this main extension, which are discussed in further detail below. When determining how to recover the cost of this project, it is important to recognize that this water main extension will enable the City to serve more than the 27 connections from the Ferncliff and Casey Street Water Systems. Because Section 13.08.050 of the Bainbridge Island Municipal Code (BIMC) requires new development or redevelopment occurring within 300 feet of an existing water main to connect to that water main rather than drilling a well, City staff decided to focus on properties that are located within 300 feet of the main extension. This analysis

excludes properties that are located more than 300 feet from the water main because (a) the main is not explicitly being sized to meet their demands and (b) the process of estimating if and when these homes will connect to the City's water system would be highly speculative in nature.

Including the connections from the Ferncliff and Casey Street Water Systems, City staff estimate that this water main extension could accommodate up to 101 connections under the Grand Avenue route (Alternative #1) and up to 104 connections under the Ferncliff Avenue route (Alternative #2). The City recently surveyed 60 properties near the Ferncliff and Casey Street Water Systems to gauge their interest in connecting to the new water main. Of the 23 responses that the City received, 7 homes expressed interest in connecting to the main along the Grand Avenue Route (Alternative #1) and 5 homes expressed interest in connecting to the main along the Ferncliff Avenue Route (Alternative #2).

A. Local Facilities Charge

Under this alternative, the City would charge the benefitting properties for a proportionate share of the cost of the main extension. The 101 connections served under Alternative #1 would pay between \$6,040 and \$7,921 per connection; if the City were to pursue Alternative #2, the cost per connection would fall between \$5,481 and \$7,212 for the 104 connections added.

Pros:

- This is the least expensive option for the City overall, as the new connections will eventually pay for the entire cost of the project.
- The upfront cash funding received from the new connections would reduce the amount that the City would need to fund from its own resources.

Cons:

- This alternative results in the most adverse impacts to the benefitting properties. In addition to the local facilities charge, they would have to pay the City's system participation fee (SPF) as well as other upfront charges for the physical service connection, which together could add up to an additional \$4,750 – \$6,300 per connection. An upfront cost on the order of \$10,000 – \$14,000 could be prohibitive for at least some of the benefitting properties.
- The policy decision to target the recovery of these costs to the properties specifically benefitting from this water main extension calls into question the extent to which these properties should pay for a proportionate share of other facilities. The need to account for facilities that do not serve these properties can increase the complexity of calculating and administering SPFs.
- There is also the potential for a consistency issue, given that other properties in the City might not have had to pay directly for the local mains serving them.
- While the cost of the project is appropriately allocated across the broader base of customers that would benefit from the main extension (rather than being allocated solely to the properties that are currently looking to connect to the City's water system), this introduces a degree of

uncertainty as to when the City will be able to recover the cost of the project from the benefitting properties. Until the connections occur, the City and its ratepayers will have to fund the project.

B. Monthly Water Rate Surcharge

This alternative would roll the local facilities charge into a monthly rate surcharge with specified terms, with the goal of spreading the recovery of the cost over time. Based on the range of cost estimates provided above, the monthly surcharge per connection would fall into the range of \$30.45 – \$44.01 if the City were to impose the surcharge over a 15-year period with no interest. At an interest rate of 2.5% (consistent with current bond interest rates), the monthly rate surcharge would range from \$36.89 – \$53.31. As a variation of this alternative, the City could issue bonds to fund the project and build the related principal and interest payments into a monthly surcharge applicable to the benefitting properties.

Pros:

- Because this alternative still targets full cost recovery from the benefitting properties, the City and its ratepayers would eventually be made whole.
- This alternative results in a lower upfront cost impact to the benefitting properties, increasing the likelihood that they would be able to afford connecting to the new water main.

Cons:

- Even though the rate surcharge spreads the financial impact out over time, the monthly cost per connection is still significant. Assuming 700 cubic feet per month of water usage, a single-family home with a 3/4” meter would pay \$22.81 per month for water service. A monthly rate surcharge of \$36.89 – \$53.31 would be roughly twice the water bill.
- Unless the City issues bonds to fund the cost of the project, spreading the recovery of the project cost over time would require the City’s water utility to use its funds to cover the cost until it can be reimbursed. Given the potential for customer delinquency and uncertainty about when the benefitting properties will connect and begin paying the surcharge, this alternative would also subject the City to a greater degree of risk (especially if it does issue debt to fund the project) than spreading cost recovery across the City’s entire water customer base would.
- City staff would need to undertake an accounting process to monitor customer payments of the surcharge and ensure that the correct amounts are paid. Combined with a heightened potential for customer service calls, this would increase the administrative burden on City staff.
- The policy decision to target the recovery of these costs to the properties specifically benefitting from this water main extension calls into question the extent to which these properties should pay for a proportionate share of other facilities. The need to account for facilities that do not serve these properties can increase the complexity of calculating and administering SPFs.
- There is also the potential for a consistency issue, given that other properties in the City might not have had to pay directly for the local mains serving them.

C. System Participation Fee (SPF)

The City imposes SPFs on new development to recover an equitable share of system infrastructure. The cost basis for the SPF includes existing assets as well as planned capital projects – given that the City’s SPF reflects an “average cost” methodology, the decision to include the cost of this water main extension as an existing asset (once it is completed) or as a future project (until it is completed) does not impact the calculated charge. Based on the cost estimates provided in **Exhibit 1**, incorporating the cost of the water main extension into the SPF calculation would increase the City’s water SPF by \$100 – \$141 per meter capacity equivalent (MCE).

Given that the City’s 2018 Rate Study projected near-term growth on the order of 55 – 60 MCEs per year, this increase would generate between \$5,500 and \$8,500 per year in additional SPF revenue. The City could use this revenue to recover the cost of the main extension over time – based on the estimated capacity of the system and the projected annual growth rates, the City could recover approximately 40% of the cost of the main extension by 2050. Alternatively, if the City were to issue 20-year bonds with an interest rate of 2.5% to fund the main extension, the additional SPF revenue would cover roughly 15 – 20% of the annual principal and interest payments.

Pros:

- This alternative reduces the upfront cost impact to the benefitting properties, increasing the likelihood that they would be able to afford connecting to the new water main.
- Building the cost of this project into systemwide charges is simpler to administer than determining and tracking area-specific charges. It is also consistent with the City’s decision in the 2018 Rate Study to move away from area-specific charges.

Cons:

- Embedding the cost of the water main extension in the SPF would shift the recovery of costs associated with this project to other customers. There could be a consistency issue if the City requires developers in other parts of the City to fund comparable infrastructure to serve their properties while embedding the cost of this water main extension in the SPF paid by all development. The incremental SPF associated with this project will only recover about 40% of the total cost, requiring either the benefitting properties or the City’s entire base of ratepayers to cover the remainder.
- Planning to use the incremental SPF revenue to repay debt attributable to the project would expose the City to risks associated with year-to-year volatility in SPF revenue collections. If growth slows down and the City receives less SPF revenue than expected, its ratepayers would have to cover the shortfall.

D. Monthly Water Rates

Another option would be for the City to include the cost of the water main extension in the water utility capital improvement plan (CIP) and fund it as part of the water utility’s ongoing obligations. The financial plan developed as part of the 2018 Rate Study anticipated the issuance of about \$1.7 million in revenue bonds around 2024 to fund the six-year CIP, given planned investments in a new

storage tank and treatment improvements. The City could decide to use its existing water utility cash balances to cover the cost of the main extension, increasing the bond issue to compensate for the reduction in cash funding available for the planned treatment improvements. Depending on the rate at which the City completes planned capital projects over the next several years, it might need to accelerate the bond issue to 2023.

Assuming 20-year bonds, an interest rate of 4.0% (conservative assuming that interest rates will increase over the next couple of years), issuance costs equal to 1.0% of the amount issued, and a reserve requirement equal to one year's debt service payment, the water utility's annual debt service would increase by \$36,000 – \$64,000 depending on the cost of the water main extension. This equates to roughly 3 – 5% of the City's budgeted annual water rate revenue, which the City could potentially spread over a five-year period.

Pros:

- This alternative reduces the upfront cost impact to the benefitting properties, increasing the likelihood that they would be able to afford connecting to the new water main. This would ultimately increase the number of ratepayers across which the City could spread the water utility's largely fixed costs.
- Building the cost of this project into systemwide charges is simpler to administer than determining and tracking area-specific charges. It is also consistent with the City's decision in the 2018 Rate Study to move away from area-specific charges, consolidating the residential water rate structure for customers in the Winslow and Rockaway Beach systems.

Cons:

- Embedding the cost of the water main extension in the financial plan underlying systemwide water rates would shift the recovery of costs associated with this project to other customers. There could be a consistency issue if the City requires customers in other parts of the City to fund comparable infrastructure to serve their properties while embedding the cost of this water main extension in the rates paid by all customers.

E. Hybrid Approach

The City can choose a combination of the funding alternatives discussed above, with the key question pertaining to how the City sets a targeted level of cost recovery from the benefitting properties as a matter of policy. **Exhibit 2** summarizes the charges that would apply under three scenarios:

- No direct cost recovery from the benefitting properties. The cost of the main extension is built into the SPF and rates applicable to all customers.
- 50% direct cost recovery from the benefitting properties. 50% of the cost of the main extension is built into the SPF; the remainder is rolled into a monthly surcharge applicable to the benefitting properties for a 15-year period. Given that the City only expects a limited number of these properties to connect in the near future, this scenario envisions increasing water rates as needed to cover the incremental costs associated with the main extension.

- Full direct cost recovery from the benefitting properties. The cost of the main extension is not built into the SPF but is rolled into a monthly surcharge applicable to the benefitting properties for a 15-year period. Given that the City only expects a limited number of these properties to connect in the near future, this scenario envisions increasing water rates as needed to cover the incremental costs associated with the main extension.

	<u>Low End</u> Ferncliff Avenue Route (Alt. #2) @ \$570,000	<u>High End</u> Grand Avenue Route (Alt. #1) @ \$800,000
Scenario 1: No Direct Cost Recovery from Benefitting Properties		
Upfront Cost to Benefitting Properties ¹		
Local Facilities Charge (If Paid Upfront) ²	(N/A)	(N/A)
SPF per Meter Equivalent (Applies to Citywide Development)	\$3,906	\$3,947
Total	\$3,906	\$3,947
Ongoing Monthly Cost for Benefitting Properties ¹		
Monthly Surcharge (For 15 Years, if LFC is Not Paid Upfront) ²	(N/A)	(N/A)
Monthly Water Bill @ 7 ccf (Applies to All City Water Customers) ³	\$24.92	\$25.27
Total (Assuming 7 ccf per Month of Water Usage)	\$24.92	\$25.27
Increase Over 2027 Bill Per 2018 Rate Study Projections (\$23.51/Month)	\$1.41	\$1.76
Scenario 2: 50% Direct Cost Recovery from Benefitting Properties		
Upfront Cost to Benefitting Properties ¹		
Local Facilities Charge (If Paid Upfront) ²	\$2,741	\$3,961
SPF per Meter Equivalent (Applies to Citywide Development)	\$3,856	\$3,877
Total	\$3,856 – \$6,597	\$3,877 – \$7,838
Ongoing Monthly Cost for Benefitting Properties ¹		
Monthly Surcharge (For 15 Years, if LFC is Not Paid Upfront) ²	\$18.45	\$26.67
Monthly Water Bill @ 7 ccf (Applies to All City Water Customers) ³	\$24.78	\$24.98
Total (Assuming 7 ccf per Month of Water Usage)	\$24.78 – \$43.23	\$24.98 – \$51.65
Increase Over 2027 Bill Per 2018 Rate Study Projections (\$23.51/Month)	\$1.27	\$1.47
Scenario 3: Full Direct Cost Recovery from Benefitting Properties		
Upfront Cost to Benefitting Properties ¹		
Local Facilities Charge (If Paid Upfront) ²	\$5,481	\$7,921
SPF per Meter Equivalent (Applies to Citywide Development)	\$3,806	\$3,806
Total	\$3,806 – \$9,287	\$3,806 – \$11,727
Ongoing Monthly Cost for Benefitting Properties ¹		
Monthly Surcharge (For 15 Years, if LFC is Not Paid Upfront) ²	\$36.89	\$53.31
Monthly Water Bill @ 7 ccf (Applies to All City Water Customers) ³	\$24.58	\$24.79
Total (Assuming 7 ccf per Month of Water Usage)	\$24.58 – \$61.47	\$24.79 – \$78.10
Increase Over 2027 Bill Per 2018 Rate Study Projections (\$23.51/Month)	\$1.07	\$1.28

¹Includes all customers in the Ferncliff area within 300 feet of the main extension.

²The City could offer the benefitting properties the option of paying the LFC upfront or over time as a monthly rate surcharge.

³Sample bills shown for 2027, after phasing in the rate increase needed to cover debt service related to the main extension.

Exhibit 2 indicates that based on the range of project costs shown above, the decision to embed the full cost of the main extension in systemwide rates and SPFs would cost an average ratepayer \$0.34 – \$0.48 per month relative to a policy decision to target full direct cost recovery from the benefitting properties. There is a rate impact in all scenarios due to the expectation that only a limited number of benefitting properties will connect to the main in the near future. All scenarios assume that the 27 connections from the Ferncliff and Casey Street Water Systems and the additional 5 – 7 properties that expressed interest during the City’s recent survey will connect to the main within the next year –

based on input from City staff, this analysis assumes that an additional property will connect every two years.

Pros:

- Balancing the pros and cons of the other approaches, this approach mitigates the upfront cost to the benefitting properties while limiting the impact of the project on other customers.

Cons:

- Because it includes multiple variables and parameters, the hybrid method is more complex to administer than the other approaches.

When considering whether to recover the cost of the water main extension directly from the benefitting properties or from the City's water customer base as a whole, it is important to consider how this decision will impact the affordability of the City's rates for its existing customers (especially as a precedent for similar water system acquisitions in the future). Rate affordability has traditionally been evaluated as a percentage of median household income, with water and sewer rates being defined as "affordable" if the bill of a typical resident is less than or equal to 4.5% of median household income. 2019 data from the American Community Survey indicates that the median household income in Bainbridge Island is \$117,990 (this evaluation uses median income for residents of Bainbridge Island because it is more representative of the income level of customers paying the City's rates than data for the Bremerton-Silverdale Metropolitan Statistical Area that the City uses in other affordability evaluations). A typical single-family residence using 7 ccf per month would pay a combined water/sewer bill of \$116.46 per month, which represents approximately 1.2% of median household income.

While this would suggest that the City's rates are well within the range defined as "affordable," there has been a growing consensus in the industry that median household income is a flawed metric to use in evaluating the affordability of utility rates. Dr. Manuel Teodoro (a professor at the University of Wisconsin) has been a key contributor in the discussion of alternative metrics that can inform a more meaningful assessment of affordability, with his work appearing in multiple industry publications. Dr. Teodoro's proposed metrics include:

- **Hours at Minimum Wage (HM):** This metric quantifies the amount of time that someone earning minimum wage would need to work in order to pay their bill. Dr. Teodoro has recommended 8.0 hours as an upper limit when evaluating the relative affordability of a utility's water and sewer rate structures. For the purpose of this evaluation, Dr. Teodoro focuses on an assumed "lifeline" volume of 50 gallons per capita per day (which equates to roughly 5 ccf based on the City's average household size of 2.4 persons). At 5 ccf, the combined monthly water/sewer bill would be \$97.84 – someone earning the 2021 minimum wage of \$13.69 per hour would need to work 7.1 hours to pay this bill.
- **Affordability Ratio at the 20th Income Percentile (AR₂₀):** This metric expresses the combined bill as a percentage of the discretionary income of a home in the 20th income percentile after accounting for the cost of food, housing, power, and healthcare. Dr. Teodoro has recommended 10.0% as an upper limit when evaluating the relative affordability of a utility's water and sewer

rate structures. Based on 2019 data from the American Community Survey and the Bureau of Labor Statistics' Consumer Expenditure Survey, we estimate that a household at the 20th income percentile in Bainbridge Island has approximately \$1,750 in discretionary monthly income. The combined water, sewer, and surface water bill of \$97.84 represents 5.6% of the discretionary income of a home in the 20th income percentile.

Exhibit 3 provides a forecast of the combined utility bill and projected values of HM and AR₂₀:

Exhibit 3: Forecast of Utility Rate Affordability

2018 Rate Study Forecast	2021	2022	2023	2024	2025	2026
Annual Water Rate Increases		2.0%	2.0%	2.0%	2.0%	2.0%
Annual Sewer Rate Increases		2.0%	2.0%	2.0%	2.0%	2.0%
Monthly Single-Family Bill @ 5 ccf	\$97.84	\$99.84	\$101.86	\$103.91	\$105.98	\$108.12
Projected HM (Target: ≤ 8.0)	7.1	7.2	7.2	7.2	7.2	7.2
Projected AR ₂₀ (Target: ≤ 10.0%)	5.6%	5.7%	5.8%	5.9%	6.1%	6.2%

With Main Extension ¹	2021	2022	2023	2024	2025	2026
Annual Water Rate Increases		3.0%	3.0%	3.0%	3.0%	3.0%
Annual Sewer Rate Increases		2.0%	2.0%	2.0%	2.0%	2.0%
Monthly Single-Family Bill @ 5 ccf	\$97.84	\$100.01	\$102.21	\$104.45	\$106.72	\$109.06
Projected HM (Target: ≤ 8.0)	7.1	7.2	7.2	7.2	7.2	7.2
Projected AR ₂₀ (Target: ≤ 10.0%)	5.6%	5.7%	5.8%	6.0%	6.1%	6.2%

¹Based on the scenario with the greatest potential rate impacts (Grand Avenue Route, No Direct Cost Recovery).

Note that the calculation of HM in **Exhibit 3** assumes that the prevailing minimum wage increases by 2.0% per year, consistent with the annual adjustments provided for by RCW 49.46.020 (2)(b) based on the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W). The calculation of AR₂₀ assumes that the net monthly disposable income of a household in the 20th income percentile remains at \$1,750, reflecting the assumption that income and expenses increase at comparable rates of inflation.

With these assumptions, **Exhibit 3** suggests that the City's rates will remain affordable under both of these measures over the next five years. It also indicates that funding the cost of the water main extension through rates will have a negligible impact on the overall affordability of the City's rates, assuming that the City can spread the recovery of the cost over time through interfund or external borrowing. A key reason for this finding is that the sewer bill for a single-family home using 5 ccf per month is \$79.09, or about 81% of the current monthly bill of \$97.84 – modest increases to the water bill do not materially impact the combined total bill. **Exhibit 3** indicates that in the scenario where the City funds the water main extension through the water utility, the cumulative impact to the projected monthly water bill by 2026 is only \$0.94. If the City were to fund multiple main extensions through its water utility and affordability became an issue, it could consider revisiting its sewer rate structure and reducing the base charge per account (currently \$42.69 per month) while increasing its volume-based sewer rate (currently \$7.28 per ccf).

While the City can set the level of cost recovery from the benefitting properties as a matter of policy, it appears reasonable to conclude that the water utility would need to share the cost in order for the main extension to be financially feasible for the properties that it would serve. The City may need to

amend Section 13.10.050 (A) of the Bainbridge Island Municipal Code, which indicates that “the installation of water mains to properties not previously served shall be at the benefitted property owner’s or developer’s expense,” to pursue this path.

The City would be able to justify such investments on the grounds that consolidating systems like the Ferncliff and Casey Street systems into the municipal water system:

- Provides the potential for better economies of scale and improves efficiency of service, benefitting existing ratepayers by expanding the customer base across which the utility’s overhead costs can be spread;
- Provides the City with greater control over local water resources;
- Provides valuable redundancy in infrastructure; and
- Promotes consistency in the level of service that the City’s residents receive.

If the City decides to pursue a hybrid funding approach for future extensions, we would recommend establishing a consistent policy regarding what the City expects benefitting properties to pay through direct assessments versus through systemwide water rates and SPFs.

Draft Technical Memorandum

Date: May 10, 2021

Project: 19-2682. Bainbridge Island WWTPs CECs Removal Evaluation and Pretreatment Program Support

To: Mr. Chris Munter, Project Manager
Mr. Charles Krumheuer, Public Works Manager
Mr. Joel Goodwin, Operations Project Manager
Mr. Shane Cooper, Lead Wastewater Operator
Mr. Chris Wierzbicki, Public Works Director
City of Bainbridge Island, WA

From: Jason Flowers, Project Manager
Miaomiao Zhang, Principal Engineer
Murraysmith

Re: Technical Memorandum - 05
Bainbridge Island WWTP CECs Removal Evaluation and Pretreatment Program Support Summary

Introduction

Murraysmith, Inc. (Murraysmith) was contracted by City of Bainbridge Island (City) to perform a study of the City's Winslow Wastewater Treatment Plant (WWTP) that included the following:

1. Evaluating the strength and impact of industrial/commercial dischargers;
2. Assisting in developing a Contaminants of Emerging Concerns (CECs) sampling and testing program;
3. Evaluating options for upgrading the Winslow WWTP to remove CECs present and improving nitrogen removal; and,
4. Developing options for increasing the Winslow WWTP capacity.

The findings from this work are summarized and expanded upon in this Technical Memorandum (TM), and further documented in a series of TMs entitled "*Bainbridge Island WWTP CECs Removal Evaluation and Pretreatment Program Support TM 01 through TM 04*", (Murraysmith, 2021).

Executive Summary

A summary of findings from the study is as follows:

1. Based on the limited sampling and analysis the industrial/commercial dischargers to the Winslow WWTP contribute a very small portion of the loading and do not require pretreatment at this time. Continued sampling, outreach and education, and monitoring are recommended.
2. The CECs found in the Winslow WWTP are comparable to or lower than those concentrations found in similar WWTPs. Washington State Department of Ecology (Ecology) has no near-term plan to enforce any regulations on CEC removal at WWTPs. CEC removal alternatives at the Winslow WWTP are cost prohibitive with the construction costs ranging from \$1.4 million to \$9.0 million and will significantly increase the operation and maintenance effort and costs.
3. The Winslow WWTP capacity limitations and new nutrient removal requirements are priority issues to be resolved. WWTP influent loadings are approaching the design capacity and it is anticipated that the WWTP will likely be required to prepare a plant re-rating request to Ecology or a full facility plan in the next few years to address this issue.
4. The Winslow WWTP will be required to meet new nutrient reduction regulations that become effective in late 2021. Preliminary analysis indicates that the existing WWTP will initially be able to meet the new requirements without near-term capital improvements, although the WWTP still needs to perform additional nutrient monitoring, reporting and optimization. It is uncertain how long the WWTP will be able to meet the new nutrient effluent limits with the increased influent waste loads before implementing treatment capacity improvement alternatives.

Recommended priority actions from the study are as follows:

- Within the next year, prepare and implement a short-term plan to confirm influent loading, optimize existing treatment processes to maximize organic pollutants, solids and nutrient removal, and improve solids settleability. The initial cost estimate for this effort is on the order of \$100,000.
- Within two years, and with information gained during the planning phase above, prepare a facility plan to re-rate the plant and confirm long term treatment improvement requirements with state regulators. The initial cost estimate for this effort is on the order of \$400,000.
- Within four years, and with information gained from the facility plan, design and construct treatment improvements to address plant capacity and nutrient reduction requirements (the latter if needed). The initial cost estimate for this effort is on the order of \$1 million.

Industrial/Commercial Dischargers Impact Evaluation

Based on the limited sampling conducted in summer 2020 at two industrial/commercial locations (Three Tree Lane and Coppertop) and two residential background locations (Bromley and Wing Point), the industrial/commercial dischargers contribute a very small portion of the loading to the Winslow WWTP. The industrial/commercial waste loading should not have a significant impact on the Winslow WWTP loading, therefore will not currently require pre-treatment. Additional sampling after COVID is recommended to confirm those findings.

If industrial/commercial facilities increase production, or if additional facilities are constructed, installing sampling manholes to allow for more accurate sampling is also recommended. In the meantime, the City should update the Fats, Oils, and Grease (FOG) ordinance and continue providing outreach and education to the industrial/commercial dischargers on how to mitigate the potential impact of discharges into the collection system. Medium priority recommendations are as follows.

- On a monthly basis, conduct additional industrial/commercial discharge sampling to confirm the findings from the 2020 sampling;
- On an annual basis, continue providing outreach and education to industrial/commercial dischargers on how to mitigate the impact of discharges into the collection and treatment system. Within the next year, update the Fats, Oils, and Grease (FOG) ordinance; and,
- If industrial/commercial facilities increase production or if additional facilities are constructed, install sampling manholes to allow for accurate sampling.

See Technical Memorandum – 04 for additional information.

CECs Testing and Removal Evaluation

CEC testing conducted at the Winslow WWTP in spring and summer of 2020 detected a series of contaminants at levels lower than the Federal Drinking Water Standards. For example, EPA lifetime Drinking Water Health Advisory Level for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) is 70 ng/L, while PFOA and PFOS detected in the effluent at Winslow WWTP is less than 22 ng/L.

The Washington State Department of Ecology (Ecology) has no near-term plan to enforce any regulations on CEC removal at WWTPs. The 2020 Draft Poly-fluoroalkyl Substances (PFAS) Chemical Action Plan (CAP) issued by Ecology and the Washington Department of Health recommends Ecology to sample PFAS in different types of WWTPs with secondary treatment, nutrient removal, and advanced solids. Based on the sampling, Ecology may consider additional PFAS monitoring requirement for WWTP dischargers.

Any CEC removal alternatives targeting the levels present at the Winslow WWTP is cost prohibitive with the construction cost opinion ranging from \$1.4 million to \$9.0 million and will significantly

increase the operation and maintenance effort and costs. Since there is no near-term regulatory driver for the City to implement changes to address CECs, the City should keep monitoring the progress of Federal and State regulations on CECs and be mindful that influent and effluent CEC monitoring may be required in the future.

See Technical Memorandum – 01B for additional information.

Nutrient Removal Evaluation

One of the priorities for the City is to gain a better understand of the Winslow WWTP nutrient removal capacity and prepare the WWTP to comply with requirements in the forthcoming Ecology Puget Sound Nutrient General Permit (PSNGP).

The Winslow WWTP will be required to meet the nutrient monitoring and optimization requirement once the PSNGP becomes effective in late 2021, along with all of the 67 WWTPs discharging into Puget Sound. If the City can provide sufficient data to demonstrate that the WWTP has an annual average effluent Total Inorganic Nitrogen (TIN) concentration of less than 10 mg/L (which is currently the case,) the WWTP will likely be exempt from additional actions beyond monitoring and annual optimization reporting. Therefore, a WWTP re-rating study or facility plan effort is critical to keep the WWTP in compliance.

Within five to ten years there is a possibility that a new individual waste load allocation for the Winslow WWTP will replace the annual TIN discharge loading limit. The numerical effluent TIN limit is to be developed and might be between 3 and 10 mg/L. A combination of process optimization and a major process upgrades may be required to achieve 3 mg/L of TIN and handle the increased BOD and TSS future loading. Initial construction cost estimates to for treatment improvements address nutrient reduction requirements begin at \$800,000. High priority recommendations are included in the Plant Capacity Evaluation section below.

See Technical Memorandum – 02 for additional information.

Plant Capacity Evaluation

The Winslow WWTP capacity is the most important issue currently facing the City.

The Winslow WWTP NPDES permit defines the facility's design criteria and requires the permittee to submit a plan and a schedule for continuing to maintain the capacity if the actual plant influent flow or waste load reaches 85% of the 1.2 MGD rated flow or 2,642 lb/day BOD or TSS loading for three consecutive months. The plant has had exceedances of 85 percent of the rated BOD or TSS loading for two consecutive months since 2017. The recent data indicate a more rapid increase in BOD and TSS loadings during the COVID time.

Although the plant influent loadings are approaching the design capacity, the plant has been performing well and is meeting all discharge limits during normal operation. The one recent exception is the fecal coliform exceedance that occurred in January 2021. That exceedance was

primarily due to only one secondary clarifier being online and it was overloaded during the January 2021 high flow event. The Return Activated Sludge (RAS) flow rate was low and the sludge settleability was extremely poor, which resulted in solids flowing over the secondary clarifier to the UV disinfection triggering the fecal coliform exceedance. To avoid a similar situation in the future, the City has developed a policy of requiring that additional secondary clarifiers be brought online during high flow events, and implementing other modifications such as activating flow pacing RAS to prevent sludge buildup in the secondary clarifier and implementing methods to improving sludge settleability.

Although it is difficult to predict the waste load growth rate once the COVID pandemic is over, it is anticipated that the WWTP will likely exceed the 85 percent of design capacity for three consecutive months in the next few years. The City should continue monitoring the influent loadings and prepare for a plant re-rating request to Ecology or a full facility plan effort. priority recommendations are as follows.

- Immediately take steps to improve the Winslow WWTP operation and process control to prevent solids carryover, including developing standard operating procedures during high flow events and flow-pacing RAS flow. These steps have been taken and investigation into ways of improving sludge settleability is underway.
- Continue to monitor influent BOD to track waste loading.
- Begin scheduling nutrient testing twice a month based on the monitoring and reporting requirement in the PSNGP to establish the nutrient baseline data.
- Over the next year, work with Ecology to verify the PSNGP requirements by supplying the historical plant nutrient data, confirming the monitoring schedule, recording, and reporting requirements.
- Within the next year, prepare and implement a short-term plan to confirm influent loading, optimize existing treatment processes to maximize organic pollutant, solids and nutrient removal, and improve solids settleability. The initial cost estimate for this effort is on the order of \$100,000.
- Within two years, and with information gained during the planning phase above, prepare a facility plan to re-rate the plant and confirm long term treatment improvement requirements with state regulators. The initial cost estimate for this effort is on the order of \$400,000.

Within four years, and with information gained from the facility plan, design and construct treatment improvements to address plant capacity and nutrient reduction requirements. The initial cost estimate for this effort is on the order of \$1 million.

See Technical Memorandum – 03 for additional information.