Capital Regional District

625 Fisgard St.,
Victoria, BC V8W 1R7

Notice of Meeting and Meeting Agenda
Wilderness Mountain Water Service Commission

Thursday, November 19, 2026 | **9:30 AM** | **Goldstream Conference Room, 479 Island Hwy, Victoria BC V9B 1H7**

Members of the public can view the live meeting via MS Teams link: **Click here**
Alternatively, to hear the meeting via telephone: Call: 1-877-567-6843 and enter the Participate Conference ID: 130 820 28#

P. Twamley (Chair), D. Light, A. Wickheim (EA Director)

The Capital Regional District strives to be a place where inclusion is paramount and all people are treated with dignity. We pledge to make our meetings a place where all feel welcome and respected.

1. Territorial Acknowledgement

2. Approval of Agenda

3. Adoption of Minutes

3.1. 26-1147 Minutes of the Wilderness Mountain Water Service Commission meeting of May 28, 2026

Recommendation: That the minutes of the Wilderness Mountain Water Service Commission meeting of May 28, 2026 be adopted as circulated.

Attachments: Minutes - May 28, 2026

4. Chair's Remarks

5. Presentations/Delegations

The public are welcome to attend CRD meetings in-person.

Delegations will have the option to participate electronically. Please complete the online application at www.crd.ca/address no later than 4:30 pm two days before the meeting and staff will respond with details.

Alternatively, you may email your comments on an agenda item to the Commission at legserv@crd.bc.ca.

6. Commission Business

6.1. 26-1145 Senior Manager's Verbal Update - November 2026

Recommendation: There is no recommendation. This verbal update is for information only.

6.2. 26-1148 Wilderness Mountain Island Health Compliance Options Analysis

Recommendation: The Wilderness Mountain Water Service Commission recommends:
1. That the 2027 Capital Plan be amended to include $150,000 to support the development of a Class C Conceptual Design and Cost Estimate for Option 2, funded by a combination of grants and reserves;
2. That staff complete the remaining required steps to secure funding and proceed with the Class C Conceptual Design and Cost Estimate to support a Community Petition or Alternative Approval Process for SWTO Treatment Compliance and engage with the Wilderness Mountain community; and
3. That the Juan de Fuca Water Distribution Commission be advised of the potential system connection and the incorporation of the Wilderness Mountain Water System infrastructure into its service area.

Attachments: Staff Report: Wilderness Mountain Island Health Compliance Options Analysis

Appendix A: Island Health Permit to Operate - WMWS, April 13, 2026

Appendix B: Assoc. Eng. Memo: IH Compliance Options Analysis, Sept. 10/26

6.3. 26-0893 Wilderness Mountain Water Service 2027 Operating and Capital Budget

Recommendation: The Wilderness Mountain Water Service Commission recommends the Electoral Areas Committee recommend to the Capital Regional District Board:
That the 2027 Operating and Capital Budget and the Five-Year Financial Plan for the Wilderness Mountain Water Service be approved as presented.

Attachments: Staff Report: Wilderness Mtn Water Service 2027 Op and Capital Budget

Appendix A: 2027 Budget Wilderness Mountain Water Service Budget

7. Notice(s) of Motion

8. New Business

9. Adjournment

There are no more scheduled meetings for 2026.

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Victoria, BC V8W 1R7

Capital Regional District

Meeting Minutes

Wilderness Mountain Water Service Commission

Thursday, May 28, 2026 | **9:30 AM** | **Goldstream Conference Room, 479 Island Hwy, Victoria BC V9B 1H7**

PRESENT:
P. Twamley, A. Wickheim (EA Director)

STAFF: I. Lawrence, Senior Manager, Juan de Fuca Administration; S. Irg, Senior Manager, Water Infrastructure Operations; C. Moch, Manager, Water Quality Operation; L. Xu, Manager, Local Services and Corporate Grants (EP); M. Miklea, Deputy Corporate Officer/Manager, Legislative Services; T. Pillipow, Senior Committee Clerk (Recorder)

EP - Electronic Participation

The meeting was called to order at 9:31 am.

1. Territorial Acknowledgement

Chair Twamley provided a Territorial Acknowledgement.

2. Approval of Agenda

MOVED by Director Wickheim, SECONDED by Commissioner Twamley,
That late delegation, M. LeBlanc, be permitted to speak, and that the agenda for the Wilderness Mountain Water Service Commission meeting of May 28, 2026 be approved as amended.
CARRIED

3. Adoption of Minutes

3.1. 26-0617 Minutes of the Wilderness Mountain Water Service Commission meeting of March 12, 2026

MOVED by Director Wickheim, SECONDED by Commissioner Twamley,
That the minutes of the Wilderness Mountain Water Service Commission meeting of March 12, 2026 be adopted as circulated.
CARRIED

4. Chair's Remarks

There were no Chair's remarks.

5. Presentations/Delegations

5.1. Presentations

There were no presentations.

5.2. Delegations

5.2.1. 26-0826 Delegation: Mark LeBlanc, Resident, Re: Item 6.2.: 2025 Annual Report and 6.3.: Mid-Year Capital Projects and Operational Update

M. LeBlanc spoke to Items 6.2. and 6.3.

6. Commission Business

6.1. 26-0618 Senior Manager's Verbal Update - May

I. Lawrence presented Item 6.1. for information, and noted the following:
- methods of public engagement used to encourage residents to join the commission
- a leak on Wilderness Place has been addressed
- the recent boil water advisory has been rescinded

6.2. 26-0612 2025 Annual Report

S. Irg presented Item 6.2. for information and noted the following:
- the gap in monitoring due to the meter being temporarily removed
- 2025 saw a 20% increase in usage over 2024 with 104 days under a boil water advisory
- adequacy of the current filtration unit
- high manganese issue in the treated water seems to be seasonal
- the spike in coliform bacteria

Discussion ensued regarding:
- potential health risks of the coliform bacteria
- that staff reach out to experts to determine coliform source(s)
- turbidity being the trigger for a boil water advisory to take effect
- replacement of the fixed dock and installation of the floating platform
- acquiring test samples of lake water from various spots
- including per-and polyfluoroalkyl substances testing on the raw water in the 2027 budget

6.3. 26-0611 Mid-Year Capital Projects and Operational Update

I. Lawrence presented Item 6.3. for information and noted the following:
- Island Health compliance assessment options analysis is underway and staff will share results at the November meeting
- upgrades to the Supervisory Control and Data Acquisition (SCADA) system which allows more timely and reliable oversight of the Wilderness Mountain facility
- this year's priority has been maintaining system stability

Discussion ensued regarding:
- clarification of the conditions to be met under the Island Health operating permit
- the types of filters used in the filtration system
- the life span of the concrete reservoir tanks

7. Notice(s) of Motion

There were no notice(s) of motion.

8. New Business

There was no new business.

9. Adjournment

MOVED by Director Wickheim, SECONDED by Commissioner Twamley,
That the Wilderness Mountain Water Service Commission meeting of May 28, 2026 be adjourned at 10:21 am.
CARRIED

_____
CHAIR

_____
RECORDER

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REPORT TO WILDERNESS MOUNTAIN WATER SERVICE COMMISSION
MEETING OF THURSDAY, NOVEMBER 19, 2026

SUBJECT **Wilderness Mountain Island Health Compliance Options Analysis**

ISSUE SUMMARY

Update the Wilderness Mountain Water Service Commission on water supply options to comply with Island Health timeline requirements.

BACKGROUND

The Wilderness Mountain Water Service (WMWS) provides potable water to 74 residential customers from the Wilfred Reservoir, a surface water source. Over the years, the system has experienced several boil water advisories due to water quality issues. During these events, elevated turbidity has been accompanied by increased colour, organic matter, algae, and manganese concentrations, creating ongoing water quality challenges for the system.

Due to drinking water advisories in 2016 and early 2017, Island Health issued a letter on July 17, 2017, stating that the water supply system was not in compliance with the Ministry of Health's (MOH) Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies in BC and requested that the Capital Regional District (CRD) submit a written work plan outlining how the WMWS will comply. An options and feasibility study was completed by Colquitz Engineering in 2018, which was presented to the Wilderness Mountain Water Service Commission on November 27, 2018. No further direction was provided by the Commission at that time, and the options were not advanced.

In 2022, Associated Engineering (Associated) completed a further assessment of the option to maintain the existing source with treatment upgrades, including treatment processes such as dissolved air flotation (DAF) and roughing filtration to address the source water quality issues (Wilderness Mountain Water Services Commissioning – Treatment Concept Updates, 2022).

In 2026, Island Health issued an updated Operating Permit for the WMWS that included a requirement that the system must comply with the MOH Surface Water Treatment Objectives (SWTO) by December 31, 2030. See Appendix A.

The Operating Permit outlines the following schedule for compliance with the MOH SWTO Objectives:

Activity	Start Date	End Date
Options Study – Cost Analysis Reports	Jan 1, 2026	Dec 31, 2026
Customer/Community Petition or Alternative Approval Process for SWTO Treatment Compliance	Jan 1, 2027	Dec 31, 2027
Design and Construction Permit	Jan 1, 2028	Dec 31, 2028
Construction	Jan 1, 2029	Dec 31, 2029
Commission and Ribbon Cutting	Dec 31, 2030	Dec 31, 2030

Associated (the "Consultant") was retained by the CRD in May 2026 to prepare a technical memorandum and update the cost assessment of the two viable drinking water supply options previously identified in the 2018 Colquitz Report to 2026 dollars, to support the selection of a long-term solution for the system (Appendix B).

The options reviewed were as follows:

Option 1A – Dissolved Air Flotation Treatment Upgrade
This option involves construction of a new DAF treatment facility while retaining the current Wilfred Reservoir water source. This option provides a robust and proven treatment solution but requires significant capital investment and ongoing operational resources.

Option 1B – Roughing and Cartridge Filtration Upgrade
This option involves upgrading the existing treatment approach through the addition of enhanced filtration and disinfection processes, while retaining the current water source. This option has the lowest upfront capital cost but involves greater operational requirements and treatment uncertainty.

Option 2 – Connection to the Juan de Fuca Water Distribution System
This option involves connection of the WMWS to the Juan de Fuca (JDF) Water Distribution System and decommissioning the existing treatment facilities. This option has the highest upfront capital cost but provides the most reliable long-term water supply solution, lowest operational complexity, and lowest lifecycle costs.

The Consultant prepared preliminary capital cost estimates for the three options and the Net Present Value (NPV) for the 25-year lifecycle costs. The NPV included expected capital, operational, and maintenance costs. The capital costs in the table below are based on Class D estimates that include the design and construction of the infrastructure, 40% project contingency, 15% engineering allowance, and 10% CRD administrative and operational costs. Capital and NPV costs for the three options are summarized below:

	Option 1A	Option 1B	Option 2
Capital Cost	$6,870,000	$3,430,000	$7,470,000
Annual O&M Cost	$268,000	$492,800	$39,000
25-Year Lifecycle Cost	$11,101,000	$11,218,000	$8,075,000

Based on the analysis, Associated recommended "Option 2: Connection to the JDF Water Distribution System" as the preferred long-term solution for the WMWS. While all three options are expected to achieve compliance with the BC SWTO, Option 2 was identified as the most favourable when considering overall lifecycle costs, operational requirements, regulatory compliance, and long-term sustainability. The analysis concluded that connecting to the JDF Water Distribution System would provide a reliable source of treated drinking water while eliminating the need to construct, operate, and maintain a new standalone treatment facility and associated source water infrastructure.

The memorandum recommends advancing Option 2 into the next phase of planning and design, which would include the development of a Class C Conceptual Design and Cost Estimate, projected to cost approximately $150,000. Future work would include confirming the preferred pipeline alignment, undertaking geotechnical and archaeological investigations, identifying environmental and regulatory approval requirements, and evaluating property acquisition or

easement needs where applicable. Additional hydraulic analysis and design would also be required to refine project costs, confirm servicing requirements, and support the development of a funding strategy for future Commission consideration.

ALTERNATIVES

Alternative 1
The Wilderness Mountain Water Service Commission recommends:

1. That the 2027 Capital Plan be amended to include $150,000 to support the development of a Class C Conceptual Design and Cost Estimate for Option 2, funded by a combination of grants and reserves;
2. That staff complete the remaining required steps to secure funding and proceed with the Class C Conceptual Design and Cost Estimate to support a Community Petition or Alternative Approval Process for SWTO Treatment Compliance and engage with the Wilderness Mountain community; and
3. That the Juan de Fuca Water Distribution Commission be advised of the potential system connection and the incorporation of the Wilderness Mountain Water System infrastructure into its service area.

Alternative 2
That the Wilderness Mountain Water Service Commission direct staff to initiate Conceptual Design for Option 1a, to support a Community Petition or Alternative Approval Process for SWTO Treatment Compliance.

Alternative 3
That the Wilderness Mountain Water Service Commission direct staff to initiate Conceptual Design for Option 1b to support a Community Petition or Alternative Approval Process for SWTO Treatment Compliance.

IMPLICATIONS

Alignment with Existing Plans & Strategies

The evaluation supports long-term sustainable water service delivery by considering lifecycle costs, infrastructure renewal requirements, regulatory compliance, and operational resiliency. Connection to the JDF Water Distribution System aligns with regional approaches that leverage existing water infrastructure and centralized treatment facilities where feasible.

Financial Implications

Proceeding with Option 2 will require future capital investment to design and construct a connection to the JDF Water Distribution System. Funding options, including reserves, grants, and loans, will be evaluated through future project phases and brought forward for Commission consideration. Based on the technical analysis, Option 2 has the lowest estimated lifecycle cost and is expected to reduce long-term operating, maintenance, and asset replacement costs, providing the most cost-effective long-term solution for the Wilderness Mountain Water Service area.

Debt and Annual Usage Costs
The service is funded by parcel tax, fixed user charges, and fixed water consumption charge.

Properties connected to the water system pay the annual user charge and water consumption charge, and all properties within the local service area are responsible for the parcel tax.

For analytical purposes only, debt and usage costs for the three options have been simulated. The 2026 parcel tax, user charge and fixed water consumption charge are included for comparison.

Long-term debt for capital costs must be arranged through the Municipal Finance Authority (MFA) which offers a maximum lending term of 30 years. The cost of borrowing is the total of the estimated principal and interest payments over the borrowing term and is recovered through parcel tax. The information in Table 1 is a high-level estimation only, based on the indicative interest rates published by MFA at the time of this staff report. The actual cost of borrowing will be dependent on the finalized loan amount, actual interest rates at the time of borrowing and refinancing, and the amortization term selected.

The Wilderness Mountain Water Service Capital Plan (2027) anticipates that implementation of the selected compliance option would be funded through grants. The remaining amount would need to be funded through reserves and borrowing.

Table 1: Debt Servicing Costs – Simulation – Without Grant Funding

25-Year Amortization Term			
	Option 1A	Option 1B	Option 2
Borrowing Amount	$6,870,000	$3,430,000	$7,470,000
Indicative Interest Rate*	5.07%	5.07%	5.07%
Cost of Borrowing	$13,058,902	$6,519,946	$14,199,417
Annual Debt Payment	$522,356	$260,798	$567,977
Annual Parcel Tax per taxable folio**	$6,449	$3,220	$7,012

**MFA Indicative Market Rates used for analysis, taken from MFA Website, October 15, 2026.*
*** Calculated parcel tax set at 2026 level of 81 folios.*

Table 2: Annual Usage Costs – Simulation

Annual Usage Cost			
	Option 1A	Option 1B	Option 2
Annual System Usage Cost	$268,000	$492,800	n/a
Parcel Tax**	$1,337	$2,458	n/a
User Charge per SFE*	$1,736	$3,193	n/a
Water Consumption Charge per SFE*	$419	$772	$1,103***
Total Charges (per taxable folio)	$3,492	$6,423	$1,103

** Calculated Single Family Equivalent set 2026 level of 74 folios.*
*** Calculated parcel tax set at 2026 level of 81 folios.*
**** Usage cost is based on 5-year average of historical annual water production divided by 74 folios and 2026 JDF WDS water rate.*

Table 3: Total Annual Debt-Servicing and Usage Costs – Simulation – Without Grants

Total Annual Debt and Usage Costs				
	2026 Budget	Option 1A	Option 1B	Option 2
Parcel Tax	$1,077	$7,786	$5,678	$7,012
User Charge per SFE	$1,330	$1,736	$3,193	n/a
Water Consumption Charge per SFE	$321	$419	$772	$1,103
Total Charges	$2,728	$9,941	$9,643	$8,115

Intergovernmental Implications
The proposed connection to the JDF Water Distribution System will require coordination with regulatory agencies and approvals associated with watermain installation, land access, and construction. Additional technical review would be required to confirm system integration requirements, permitting needs, and applicable approvals.

Regional Growth Strategy Implications
The CRD's Regional Growth Strategy identifies the Wilderness Mountain Water Service area as being eligible for water service extension subject to all costs related to the extension being borne by the new users.

Service Delivery Implications
All options considered are anticipated to improve drinking water quality and support compliance with Island Health's requirement to meet the BC SWTO. Option 2 would provide access to a reliable supply of treated water from the JDF Water Distribution System and would significantly reduce operational complexity compared with maintaining and upgrading a standalone treatment facility.

CONCLUSION

Island Health's updated Operating Permit requires the Wilderness Mountain Water System to achieve compliance with the SWTO. As a result, the water supply and treatment options for the service have been updated and assessed. Based on the findings of the options analysis, the consultant has recommended a connection to the JDF Water Distribution System as the preferred long-term solution. Staff recommend that the Commission direct staff to proceed with a conceptual design for the JDF Water Distribution System connection option. The conceptual design would support future public approval through either a Community Petition or an Alternative Approval Process (AAP) and advance the project toward achieving SWTO compliance.

RECOMMENDATION

The Wilderness Mountain Water Service Commission recommends:

1. That the 2027 Capital Plan be amended to include $150,000 to support the development of a Class C Conceptual Design and Cost Estimate for Option 2, funded by a combination of grants and reserves;
2. That staff complete the remaining required steps to secure funding and proceed with the Class C Conceptual Design and Cost Estimate to support a Community Petition or Alternative Approval Process for SWTO Treatment Compliance and engage with the Wilderness Mountain community; and
3. That the Juan de Fuca Water Distribution Commission be advised of the potential system connection and the incorporation of the Wilderness Mountain Water System infrastructure into its service area.

Submitted by:	Iain Lawrence, MCIP, RPP, Senior Manager, Juan de Fuca Administration
Concurrence:	Nelson Chan, MBA, FCPA, FCMA, Chief Financial Officer & General Manager, Finance & Technology
Concurrence:	Alicia Fraser, P. Eng., General Manager, Infrastructure and Water Services
Concurrence:	Stephen Henderson, General Manager, Electoral Area Services

ATTACHMENT(S)

Appendix A: Island Health Permit to Operate – Wilderness Mountain Water System, April 13, 2026

Appendix B: Associated Engineering Technical Memorandum: Island Health Compliance Options Analysis, September 10, 2026

APPENDIX A

island health

ENVIRONMENTAL PUBLIC HEALTH

PERMIT

to OPERATE

A WATER SUPPLY SYSTEM

Water System Name: Wilderness Mountain Water System

Premises Number: 64006902

Premises Address: 706 Cains Way
Sooke, BC V9Z 1C5

Water System Owner: Capital Regional District Water

This system is hereby permitted to operate the above potable water supply system and is required to operate this system in accordance with the *Drinking Water Protection Act* and in accordance with the conditions set out in this operating permit and conditions established as part of any construction permit.

The water supply system for which this operating permit applies is generally described as:

Service Delivery Area: Mount Matheson Road, Sooke
Source Water: Wilfred Reservoir
Water Treatment methods are: Cartridge Filtration
Water Disinfection methods are: UV + Chlorine

Number of Connections: 15 - 300 Connections

Operating conditions specific to this water supply system are in Appendix A.

Date: April 13, 2026

Issued By: Tara Hilla
Environmental Health Officer

This permit must be displayed in a conspicuous place and is not transferable

Place Decal Here

APPENDIX A

WATER SYSTEM OPERATING CONDITIONS FOR
Wilderness Mountain Water System
706 Cains Way
Sooke, BC V9Z 1C5

In order to comply with the Ministry of Health (MOH) "Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies in British Columbia (SWTO)", the Capital Regional District (CRD) agrees to implement the following improvements to the Wilderness Mountain Water System:

1. Adhere to Sampling Program as approved by the Drinking Water Officer (DWO) and maintain detailed and accurate records of all monitoring performed. The Sampling Program is to include the following parameters:
    a. A free residual chloramine concentration of at least 2.0 ppm entering the distribution system and a targeted residual of 0.3 to 0.5 ppm throughout the distribution system is maintained at all times, and monitored and recorded on a routine basis as directed by the DWO.
    b. Turbidity is to be monitored and recorded on a daily basis and strategies are in place through the Emergency Response Plan to be implemented if turbidity exceeds 1.0 NTU in the distribution system.
2. The raw source water (Wilfred Reservoir) is to have a full chemical/physical test at a minimum of every five years and the results are to be submitted to the Drinking Water Officer.
3. The water supplier will complete quarterly monitoring for Disinfection By Products (DBP), including trihalomethanes (THM) and haloaceticacids (HAA), to ensure the Maximum Acceptable Concentration (MAC), as per Health Canada Drinking Water Guidelines, is not exceeded for each parameter based on a running annual average of each species:
    a. THM MAC: 100 µg/L
    b. HAA MAC: 80 µg/L
4. Schedule for compliance with MOH SWTO Objectives:

Activity	Start Date	End Date
Option Study – Cost Analysis Reports: 1. Connection to the CRD Juan de Fuca Distribution System, or; 2. Upgrade existing treatment to conventional filtration treatment	January 1, 2026	December 31, 2026
Customer/Community Petition or Alternative Approval Process for SWTO Treatment Compliance	January 1 2027	December 31, 2027
Design and Construction Permit	January 1, 2028	December 31, 2028
Construction	January 1, 2029	December 31, 2029
Commissioning and Ribbon Cutting	December 31, 2030	December 31, 2030

If unforeseen and/or extenuating circumstances prevent completion of compliance with meeting any of the dates towards compliance with SWTO the water supplier must notify the Drinking Water Officer (DWO), a minimum of 90 days in advance of the deadline, and provide rationale for the delay. Any changes to the operating permit must be approved by the DWO in writing.

Date: April 13, 2026

Issued By: Tom Hibbs
Environmental Health Officer

Associated Engineering | GLOBAL PERSPECTIVE. LOCAL FOCUS.

TECHNICAL MEMORANDUM

Issue Date:	September 10, 2026	Reference/Project No.:	21011751.01
To:	Katarina Konicek	Previous Issue Date:	August 21, 2026
From:	Keith Kohut, M.A.Sc., P.Eng.		
Client:	Capital Regional District		
Project Name:	Wilderness Mountain		
Subject:	Island Health Compliance Options Analysis		

1 BACKGROUND

The Wilderness Mountain Water System (WMWS) is located on Mount Matheson in the Juan de Fuca Electoral Area. The area was originally serviced by a private water utility beginning in approximately 1983, and the service was transferred to the Capital Regional District (CRD) in 2008. The WMWS currently includes 82 parcels and provides active water service to 74 customers as of 2025.

Raw water is sourced from Wilfred Reservoir, a small surface waterbody. Over the years, the system has experienced several boil water advisories due to water quality issues. During these events, elevated turbidity has been accompanied by increased colour, organic matter, algae, and manganese concentrations, creating ongoing water quality challenges for the system.

In 2018, Colquitz Engineering completed an options and feasibility review (the 2018 report titled “Wilderness Mountain Water system – Water Supply Feasibility Study”) for a long-term water supply to the WMWS. Based on that analysis, two options were identified for further consideration:

- Maintaining the existing source with treatment upgrades; or
- Connecting to the Juan de Fuca (JdF) Water Distribution System (WDS; at the Rocky Point reduced zone via Matheson Lake).

In 2022, Associated Engineering (Associated) completed a further assessment (the 2022 report “Wilderness Mountain Water Services Commissioning – Treatment Concept Updates”) of the option to maintain the existing source with treatment upgrades, including treatment processes such as dissolved air flotation (DAF) and roughing filtration to address the source water quality issues.

In 2026, Island Health issued an updated Operating Permit for the WMWS that includes a requirement that the system must comply with the Ministry of Health Surface Water Treatment Objectives by December 31, 2030. The Operating Permit also stipulates that an option study and cost analysis report is to be completed by December 31, 2026 for the two aforementioned water supply options.

Associated was retained by the CRD to update the cost assessment of the two viable drinking water supply options previously identified for the WMWS to 2026 dollars, and support selection of the preferred long-term solution for the system.

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2 WATER QUALITY

Table 2-1 presents a summary of raw water quality data collected for the WMWS between 2013 and 2022, along with more recent data from 2023 to 2025. The summarized results are compared against the Guidelines for Canadian Drinking Water Quality (GCDWQ) published by Health Canada (2025). Where applicable, guideline values are identified as Maximum Allowable Concentrations (MAC), Aesthetic Objectives (AO), or Operational Guidance (OG) limits. Exceedances of applicable guideline values are highlighted in orange.

Table 2-1 Raw Water Quality Summary

Parameter	Units	Drinking Water Quality Objective	2013-2022		2023		2024		2025		All Years
Carbon, Dissolved Organic	mg/L as C	-	3.8	1.9-5.4	4.2	4-4.4	4.05	3.7-4.4	4.25	4-4.5	1.9 – 5.4
Carbon, Total Organic	mg/L as C	-	4	3.0-8.8	4.3	3.9-4.6	4.6	4.1-4.8	4.5	4-4.8	3.0 – 8.8
Colour, True	TCU	≤ 15 (AO)	14	7-26	20	15-28	23	18-31	30	15-31	7 – 31
Hardness as $CaCO_3$	mg/L	-	16	11-21	16	15-17	18	16-19	17	16-20	11 – 20
pH	pH units	7.0 – 10.5 (OG)	6.9	6.1-8.1	6.9	6.3-7.3	6.9	6.3-7.2	7.1	6.5-7.6	6.5 – 8.1
Total Suspended Solids	mg/L	-	1.4	1.2-1.6	2.4	-	1.8	1.6-2	2	-	1.2 – 2.4
Total Solids	mg/L	-	50	42-88	42	-	64	54-74	<10	-	42 – 88
Turbidity, lab tests	NTU	≤ 0.3 *	0.9	0.4-5.8	0.88	0.5-1.8	0.9	0.5-2.4	1	0.9-2	0.4 – 5.8
Ultraviolet Transmittance	%	-	76.7	69.9-82.1	78.4	74.1-80.4	79.3	73.2-80.1	-	-	69.9 – 82.1
Nitrogen, Total	ug/L	-	200	84-267	245	242-247	359	250-468	267	258-276	84 – 468
Phosphate, Total	ug/L	-	6	< 1 -71	6	6-7	<10	9-13	6	1-11	< 1 -71
Sulphate	mg/L	≤ 500 (AO)	6	4-19	5	4-5	4	3.4-4.2	4	4-4	< 3.4 – 19
Arsenic	mg/L	≤ 0.010 (MAC)	< 0.0001	< 0.0001 – 0.00015	< 0.0001	< 0.0001 – 0.00013	0.00011	< 0.0001 – 0.00014	0.00028	0.00012 – 0.00063	< 0.0001 – 0.00063
Iron	mg/L	≤ 0.1 (AO)	0.174	0.111 -0.902	0.276	0.091-0.463	0.174	0.089-0.489	0.233	0.098-0.492	0.089 – 0.902
Manganese	mg/L	≤ 0.12 (MAC) ≤ 0.02 (AO)	0.055	0.024-0.364	0.055	0.020 -0.179	0.059	0.024-0.182	0.038	0.018-0.193	0.018 – 0.364
Coliform, Total	Coliforms/100 mL	Nondetectable per 100 mL (MAC)	125	< 1 – 4300	175	55-53,000	165	< 1 -190,000	640	13-120,000	< 1 – 190,000
E. coli	E. coli/100 mL	Nondetectable per 100 mL (MAC)	< 1	< 1 -29	1.5	< 1 -20	<1	< 1 -15	<1	<1-12	< 1 – 29
Cryptosporidium , Total oocysts	oocysts/100 L	-	< 1	<1	<1	<1	<1	<1	<1	<1	< 1
Giardia , Total cysts	cysts/100 L	-	< 1	<1	<1	<1	<1	<1	<1	<1	< 1

Note: Turbidity objective for drinking water depends on the treatment processes used. For the WMWS's existing cartridge filtration system, a turbidity of 0.3 NTU or less is required in order to be attributed filtration credits

Since Associated's previous assessment of drinking water treatment objectives for the WMWS, the Canadian Guidelines for Drinking Water Quality have revised the AO for iron from 0.3 to 0.1 mg/L. Iron concentrations in Wilfred Reservoir raw water has exceeded the revised AO in more than 50% of all collected samples.

Based on the data reviewed, the key physical/chemical parameters that are recommended to undergo treatment to meet current GCDWQ limits are as follows:

- Elevated turbidity exceeding the treatment limit of 0.1-1 NTU (depending on the filtration processes used);
- Elevated true colour, frequently exceeding the AO of 15 TCU;
- Elevated iron concentrations, exceeding the AO of 0.1 mg/L;
- Elevated manganese concentrations, exceeding both AO (0.02 mg/L) and MAC (0.12 mg/L) in some cases.

In addition, very low concentrations (below GCDWQ limits) of disinfection by-products (DBP) were observed in the WMWS distribution system when ammonia was added upstream of sodium hypochlorite to form monochloramine. However, the 2022 assessment reported a period during which the ammonia system was offline, and a free chlorine residual was present in the distribution system. During this period, DBP concentrations increased and exceeded the applicable MACs (0.1 mg/L for THM and 0.8 mg/L for HAA).

The CRD has also reported periodic algal blooms in the Wilfred Reservoir. Any upgrades to the existing treatment system are recommended to remove algae to minimize any potential health and aesthetic concerns from cyanobacteria, as well as to reduce the risk of treatment processes clogging during an algal bloom.

2.1 Microbiological Considerations

Based on the BC Ministry of Health "Drinking Water Treatment Objectives for Surface Water Supplies in BC" (2022), the Wilfred Reservoir's treatment requirements related to microbiological parameters are as follows:

- 4-log reduction or inactivation of viruses;
- 3-log reduction or inactivation of *Giardia lamblia* and *Cryptosporidium parvum*;
- Two treatment processes for surface water, typically a combination of filtration and disinfection;
- Less than or equal to 1 NTU of turbidity in the treated water;
- No detectable *Escherichia coli*, fecal coliform and total coliform in the treated water.

2.2 Boil Water and Public Service Advisories

Over the past several years, multiple Boil Water Advisories and Public Service Advisories have been issued to customers relying on the WMWS for their drinking water supply. Table 2-2 summarizes the recorded advisory events between 2023 and June of 2026.

Table 2-2 Summary of Boil Water Advisories

Trigger Date	Boil Water Advisory/ Public Safety Advisory	Reason
November 28, 2023 (62 days)	Public Safety Advisory	Elevated manganese levels
October 25, 2024 (31 days)	Boil Water Advisory	Elevated turbidity levels
November 28, 2024 (61 days)	Public Safety Advisory	Elevated manganese levels
March 18, 2025 (24 days)	Boil Water Advisory	Elevated turbidity levels
April 25, 2025 (6 days)	Boil Water Advisory	Issues with cavitation at the intake pump
October 14, 2025 (71 days)	Boil Water Advisory	Elevated turbidity levels
November 3, 2025 (43 days)	Public Safety Advisory	Elevated manganese levels
March 20, 2025 (27 days)	Boil Water Advisory	Elevated turbidity levels
April 29, 2026 (27 days)	Boil Water Advisory	Elevated turbidity levels

The majority of these advisories were related to water quality issues, with only one Boil Water Advisory attributed to an operational issue (intake pump cavitation). Since November 2023, five Boil Water Advisories have been issued due to elevated turbidity levels in the raw water source. In addition, three Public Service Advisories have been issued in response to elevated manganese concentrations in the source water.

These events highlight the system's vulnerability to raw water quality fluctuations and demonstrate the need for upgrades to the existing WMWS to improve treatment reliability and ensure consistent compliance with current drinking water quality objectives. The following sections present options for achieving this.

3 OPTION 1 – CURRENT SOURCE

This option involves continuing to use the existing Wilfred Reservoir supply system with upgrades to the treatment process. The existing treatment system includes cartridge filtration, UV disinfection, chloramination, and two tanks for storage and distribution. At present, no chemical pre-treatment is applied as part of the treatment process. The system will be designed for a Maximum Day Demand (MDD) of 4.1 L/s as per the recommendations of the 2020 "Water Vulnerability Study on the Wilderness Mountain Water System" by WSP.

Proposed treatment upgrades would involve one of the following processes:

- DAF
- Roughing filters with cartridge filtration

These two treatment upgrade options are described in Section 3.1 and 3.2.

Associated's previous assessment of treatment upgrades included the option to replace the existing submerged raw water intake with a floating intake. The intent of this upgrade would be to reduce the amount of silt, particulate and algae pulled into the WTP. It has not been determined at this time if the intake upgrade would be required if treatment in the WTP was upgraded, however an allowance for an upgraded intake was included.

3.1 Option 1A – Dissolved Air Flotation

This sub-option includes the introduction of chemical pre-treatment, consisting of oxidant addition and soda ash for pH adjustment and oxidation, followed by coagulation. The treated water would then undergo DAF clarification to remove suspended solids and light particulates (algae). This would be followed by filtration through an adsorbent media (such as Greensand Plus) and anthracite/sand media bed. Final disinfection would be achieved through chlorination with a contact tank to provide virus inactivation and maintain a disinfectant residual throughout the distribution system.

It is assumed that the ammonia system would be abandoned, as the DAF system would significantly reduce the number of organics and disinfection byproduct precursors that could potentially react with free chlorine. However, if a chloramine residual is preferred over a free chlorine residual, ammonia dosing can be maintained by retaining the existing ammonia system and relocating the ammonia injection point downstream of the chlorine contact tank.

Piloting of the proposed treatment is recommended, though not mandatory, to confirm process performance and optimize the design criteria for the full-scale treatment system.

3.2 Option 1B – Roughing and Cartridge Filters

This sub-option involves the addition of pre-treatment to the existing treatment process. Chemical pre-treatment would include oxidant addition and soda ash dosing for pH adjustment and to facilitate oxidation, followed by coagulation. Following chemical treatment, water would pass through a roughing filter to reduce organic concentrations and remove algae, iron, and manganese, thereby protecting downstream treatment processes. Cartridge filtration would then be applied, consisting of two 5-micron filters followed by two 0.35-micron filters in series, to provide further particulate removal. A combination of UV disinfection and chlorination would then follow to satisfy the drinking water treatment objectives for microbiological parameters.

Roughing filters and cartridge filtration alone may not be able to remove iron and manganese to below AO targets. As such, it has been assumed that filtration through an adsorbent media would need to be included in this treatment option to provide reliable iron and manganese removal under this option.

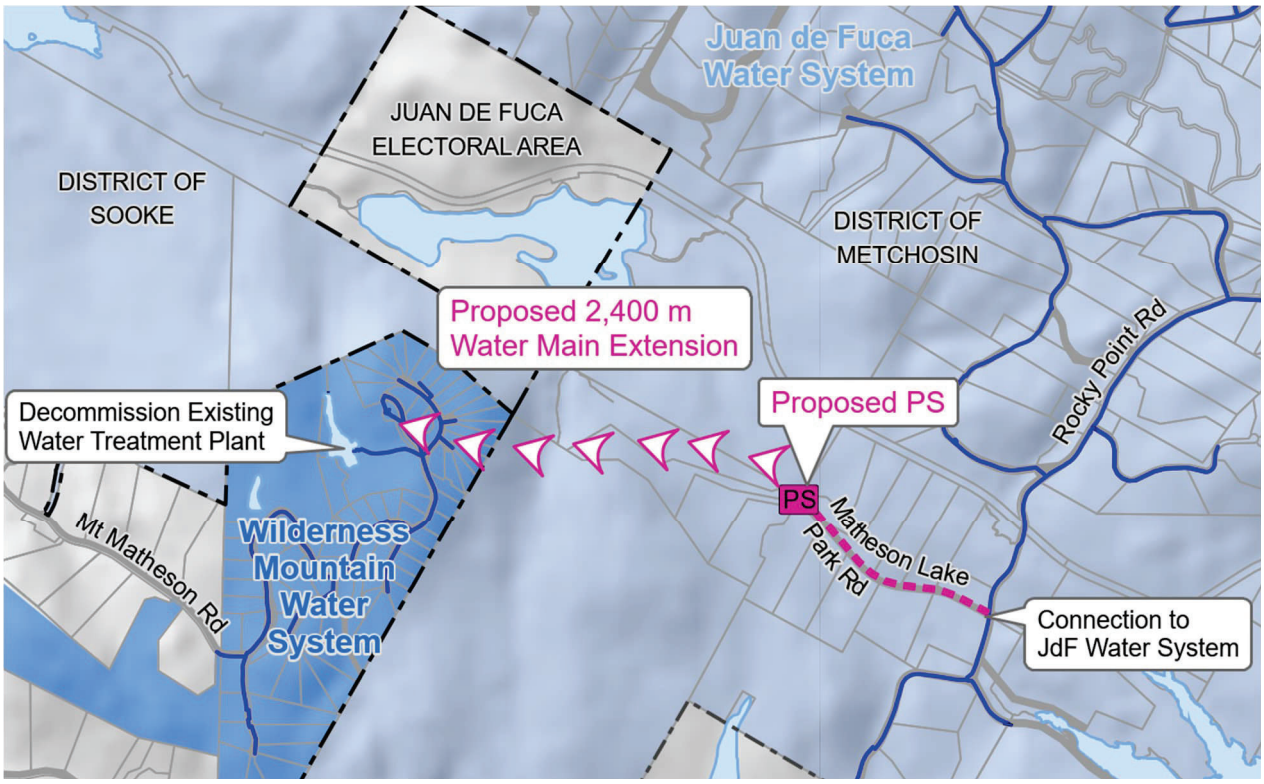
The combination of a roughing filter and cartridge filtration is not a common approach for drinking water systems to remove algae and reduce organics and colour. Piloting is strongly recommended before committing to a full-scale installation of this treatment option, to verify that this combination of processes can reliably achieve the drinking water treatment objectives (that is, proof-of-concept).

4 OPTION 2 – ROCKY POINT SUPPLY VIA MATHESON LAKE

This option focuses on supply of water to this system from the CRD's JdF WDS, rather than relying on the existing source and upgrading the current treatment process to address water quality issues. This option was initially reviewed in high level in the Colquitz (2018) feasibility study.

The feasibility-level alignment that was proposed follows a route that extends from the end of the existing JdF WDS to the WMWS. The total pipeline length is approximately 2.4 km, and includes a booster pump station to lift water to the higher elevation of the WMWS existing reservoir. Figure 4-1 illustrates the alignment being considered for Option 2.

Figure 4-1 Option 2 – Rocky Point Supply Alignment via Matheson Lake



Source: Wilderness Mountain Water System from Juan de Fuca Water System, CRD, 2026

The Colquitz study assumed that the connecting water main would be 100 mm in diameter, which is suitable for the design MDD of 4.1 L/s, but undersized if the CRD were to supply fire flows to WMWS directly from the JdF WDS. Currently the WMWS has two local storage tanks with a combined capacity of 250 m^3. To determine storage tank objectives, the sizing guidelines from the Fire Underwriters Survey (FUS) are typically used. For an MDD of 4.1 L/s and a

30 L/s fireflow, the FUS recommends a minimum reservoir size of 246 m^3. The existing WMWS storage tanks should be able to provide enough storage to locally supply fire flows. However, for this exercise it was conservatively assumed that a 150 mm diameter water main would be installed from the JdF WDS to the WMWS, to provide the flexibility to supply fireflows directly from the JdF WDS in times of an emergency .

In consideration of Option 2, it is assumed that the JdF WDS is compliant with current BC drinking water quality standards, including that the treated water contains a chlorine or chloramine residual for secondary disinfection, such that no additional treatment infrastructure would be required. However, as a contingency, it is assumed that the chloramination equipment in the existing WMWS disinfection facility will be relocated to the new booster pump station, in case the chloramine residual needs to be topped up. It is recommended that these water quality assumptions be verified if Option 2 is selected for more detailed consideration.

Supply from the JdF WDS involves the existing Rocky Point Pump Station and Reservoir. At the time of the Colquitz feasibility study, the pump station and reservoir were requiring an upgrade in capacity. The CRD has indicated that this expansion has since been completed, with sufficient capacity available to incorporate supply to the WMWS. Costs related to upgrading the Rocky Point infrastructure were therefore removed from consideration.

5 OPTIONS COMPARISON

5.1 Cost Evaluation

Table 5-1 summarizes the Class D capital Opinion of Probable Cost (+/- 50%), operation and maintenance (O&M) cost, and 25-year lifecycle cost for each option evaluated, updated to 2026 dollars. The capital cost estimates presented herein include a contingency allowance of 40%, an allowance for CRD administration and operations costs of 10%, and an engineering allowance of 15% of the total estimated capital costs. The design criteria and assumptions used to develop the cost estimates for are presented below. Detailed cost breakdowns for each option are provided in Appendix A attached.

The design criteria and assumptions for the cost estimate of the Option 1A (DAF system) are as follows:

- Include 275 m of 100 mm diameter raw water main connecting the intake to the DAF system, as per the assumptions used in the Colquitz 2018 report.
- Design flows of 1.7 L/s (ADD) and 4.1 L/s (MDD).
- N+1 redundancy to maintain one duty and one standby units throughout the treatment system.
- Inclusion of chemical systems for soda ash, coagulant and oxidant consisting of chemical tanks with containment, and duty/standby chemical pumps mounted on a chemical skid.
- System is to be delivered in a prefabricated enclosure.
- DAF system includes Greensand Plus filter skid, 6,500 L sludge holding tanks, 13,000 L backwash waste tank with decant and pump recycling system, and 11,000 L backwash supply tank with backwash pumps.
- Cost estimate includes the decommissioning of the cartridge filters, UV units, and ammonia injection system in the existing WTP.

- Existing chlorination system kept to maintain free chlorine residual at desired concentration.
- Chlorine contact tank consists of a 40,000 L tank with no baffles.
- Install flow meters at each of the existing water service connections in the WMWS.
- Includes an allowance for up to one month of pilot testing.
- Includes an allowance for replacing the existing, submerged raw water intake with a floating pump station, including the cost of conducting a bathymetric study for intake siting.
- Annual (O&M) labour, materials and power costs for the treatment infrastructure are based on CRD's 2022-2026 operating budgets for the Beddis Water System (a 3.8 L/s DAF system operated by the CRD) and the 2022-2026 operating budgets for Fulford (1 4.5 L/s DAF system operated by the CRD).
- Include annual costs for existing intake and related infrastructure, based on CRD records for the WMWS,
- O&M costs also include the replacement of the following equipment:
  - Chemical metering pumps replaced every 10 years.
  - Backwash, recycling pumps and compressors replaced every 15 years.
  - Filter media replaced every 15 years.
- Lifecycle costs based on 25 years of operation, accounting for 4% interest rates.

The design criteria and assumptions for the cost estimate of the Option 1B (roughing and cartridge filter system) are as follows:

- Include 275 m of 100 mm diameter raw water main connecting the intake to the roughing filter system, consistent with the assumption used in the Colquitz 2018 report.
- Design flows of 1.7 L/s (ADD) and 4.1 L/s (MDD).
- N+1 redundancy to maintain one operational and one standby units throughout the treatment system.
- Inclusion of chemical systems such as soda ash, oxidant and coagulant consisting of chemical tanks with containment, and duty/standby chemical pumps mounted on a chemical skid.
- The roughing filter is to be delivered in a prefabricated enclosure.
- New cartridge filters installed in roughly same location as existing cartridge filters in the existing WTP.
- New UV system installed at roughly same location as existing UV system in the WTP.
- New greensand filters will be added to the WTP.
- Existing chlorination system kept maintaining the free chlorine residual at desired concentration.
- Decommission the cartridge filters, UV units, and ammonia injection system in the existing WTP.
- Chlorine contact tank consists of a 40,000 L tank with no baffles.
- Install flow meters at each of the existing water service connections in the WMWS.
- Includes an allowance for up to one month of pilot testing.
- Includes an allowance for replacing the existing, submerged raw water intake with a floating pump station, including the cost of conducting a bathymetric study for intake siting.
- Annual costs for the new treatment equipment are based on the following assumptions:

  - The frequency of replacing the cartridge filters will be reduced from daily replacements to replacement every second day.
  - Operators will pump out and dispose of waste from the holding tank on a weekly basis.
  - An average level of effort for two operators of 18 hours/week each, or 36 hours/week total.
  - Operator hourly rate of $85/hr.
  - Average power costs are $0.14 / kWh.
  - Average chemical doses as follows:
    - Coagulant: 15 mg/L of PACl.
    - pH adjustment: 30 mg/L of soda ash.
    - Disinfection: 1.0 mg/L sodium hypochlorite.
  - An average of 12 UV lamps replaced annually.
  - General mechanical cost allowance of 0.5% of the upgrade's mechanical capital cost.
  - General electrical parts allowance of 0.5% of the upgrade's electrical capital cost.
- Include annual costs for existing intake and related infrastructure, based on CRD records for the WMWS,
- O&M costs also include the replacement of the following equipment:
  - Chemical metering pumps replaced every 10 years.
  - Backwash and air scour compressors replaced every 15 years.
  - UV ballasts replaced every 5 years.
  - UV quartz sleeves replaced every 10 years.
  - Filter media replaced every 25 years.
- Lifecycle costs based on 25 years of operation, accounting for 4% interest.

The design criteria and assumptions for the cost estimate of the Option 2 (Rocky Point Supply via Matheson Lake) are as follows:

- JdF WDS supply system is compliant with current BC drinking water quality standards and that sufficient supply capacity is available to service the WMWS.
- Watermain connecting the JdF WDS to the WMWS sized as 150 mm diameter to accommodate fireflows.
- Booster pump station pumps upsized to support a 30 L/s fireflow.
- Existing chloramination equipment from the WMWS WTP relocated to booster pump station.
- Install flow meters at each of the existing water service connections in the WMWS.
- Annual O&M costs and replacement costs are based on Colquitz, 2018, escalated by 15% in 2026 (based on Engineering News Record's historical Common Labour Indices).
- Annual O&M costs include:
  - Electrical and labour costs for the booster pump station.
  - Labour and chemical costs for water main flushing and valve exercising.
- O&M costs also include the replacement of the following equipment:

- Booster pump station pumps replaced every 25 years.
- Lifecycle costs based on 25 years of operation, accounting for 4% interest.

Table 5-1 Summary of Cost Comparison

	Option 1A	Option 1B	Option 2
Capital Cost	$6,870,000	$3,430,000	$7,470,000
Annual O&M Cost	$268,000	$492,800	$39,000
25 Year Lifecycle Cost	$11,101,000	$11,218,000	$8,075,000

Per Table 5-1, Option 1B has the lowest capital cost. However, it incurs significantly higher annual O&M costs compared to the other options, resulting in the highest overall lifecycle cost. On the other hand, Option 1A has a significantly higher upfront cost than Option 1B but benefits from lower O&M costs, leading to a slightly lower lifecycle cost. Overall, the 25-year lifecycle costs for Options 1A and 1B are comparable, and neither option provides a significant cost advantage over the analysis period.

In contrast, Option 2, while having a comparable capital cost to Option 1A, demonstrates substantially lower O&M requirements, resulting in the lowest 25-year lifecycle cost among the three options. Overall, the differences in lifecycle cost are primarily driven by variation in O&M costs rather than capital expenditures, with Option 2 expected to have the lowest O&M costs among the evaluated options. However, if significant upgrades were required to the existing infrastructure within WMWS to meet JdF standards, beyond the items already identified in the above bullets and in Appendix A, then the capital cost of Option 2 would increase.

It should be noted that these are Class D cost estimates with an accuracy range of +/- 50%. Given this level of uncertainty, the differences in cost between the options are not significant enough to support selecting a preferred option based on cost alone.

5.2 Key Benefits and Constraints

Both Option 1A and 1B provide significant upgrades to the existing treatment system and are expected to improve treated water quality to meet GCDWQ requirements, thereby enhancing the safety and reliability of the drinking water supply.

Implementation of Option 1B is expected to be more straightforward compared to Option 1A, as it builds upon the existing treatment processes with the addition of pre-treatment. In contrast, Option 1A requires decommissioning of exciting treatment units and installation of a new DAF system, media filtration, and associated infrastructure. This would result in a significantly larger overall footprint or multi-staged replacement of existing treatment equipment with new infrastructure.

However, Option 1A uses treatment processes that have long history of successful application in addressing the water quality issues seen at the WMWS. This extensive experience can be applied at the WMWS to improve performance resiliency under varying conditions. In contrast, Option 1B uses a combination of treatment that is relatively uncommon for addressing these water quality issues. Even with piloting, treatment performance and robustness of Option 1B will be more challenging to accurately predict than Option 1A.

Options 1A and 1B require regular visits to site by the CRD operations team to oversee O&M of the equipment. Based on the performance of the existing treatment system, Option 1B may require near-daily site visits by operations staff to replace spent cartridge filters. Both Options 1A and 1B will require regular visits to remove and truck out wastewater residuals generated during the treatment system's operation.

In contrast, Option 2 provides access to consistent, high quality treated water from a centralized water system and eliminates the need for constructing and operating additional, decentralized treatment facilities in the WMWS. For Option 2, no waste would be generated at the WMWS site.

The Colquitz report states that a portion of the proposed alignment along the eastern slope of Mount Matheson has an approximate grade of 45 degrees (100% slope). This exceeds the practical limits for conventional open-cut construction methods. Therefore, alternative construction techniques would be required to complete this section of the work. In addition, this option involves installation of water main infrastructure across private property and rock excavation, which could result in constructability challenges. An allowance has been incorporated into the cost estimates in consideration of these risks, but a closer examination of potential water main routes is recommended should Option 2 be selected for additional consideration.

5.3 Key Operational Considerations

In addition to the annual costs that were incorporated into the Opinions of Probable Costs, key qualitative aspects for operating and maintaining these three options were identified below.

Options 1A and 1B require periodic site visits for operational oversight, routine maintenance, and system repairs, not only for the treatment system but for the existing intake as well.

Ongoing operational requirements for Option 1A include chemical supply and handling, as well as management and disposal of residuals generated during the treatment process. Key operational tasks for Option 1B include filter cartridge replacement, chemical supply, and management of residuals generated during treatment.

Options 1A and 1B also require regular delivery of treatment chemicals, and regular shipment of residuals (liquid waste) from the plant for disposal offsite.

Option 2 requires ongoing O&M of a new booster pump station, as well as a chemical dosing system if a top-up to the choramine residual is required. The majority of other infrastructure involved is part of the JdF WDS, whose operation is not anticipated to change significantly if connected to the WMS. Maintenance of the connecting water mains may

require access to private properties. However, relative to Options 1A and 1B, this option generally presents lower overall operational complexity and staffing requirements.

5.4 Long-Term Sustainability

Option 1A is dependent on the reservoir continuing to be replenished at sufficient capacity to meet community demand. While increased algae growth may occur due to impacts from climate change (e.g., warmer temperatures), the DAF system is expected to effectively manage these conditions and protect all downstream equipment from algal clogging. Although ongoing on-site operator presence is required, the level of operational effort is considered manageable over the long-term.

Option 1B is similarly dependent on the reservoir maintaining sufficient capacity. However, increased algae levels would likely result in more frequent fouling of the cartridge filters and potentially the roughing filter. The reliance on cartridge filtration introduces long-term sustainability concerns, including the need for frequent cartridge replacement, disposal of spent filters at landfill, and a high level of ongoing operator presence to maintain system performance.

The long-term sustainability of both Options 1A and 1B are subject to the Wilfred Reservoir's recharge/refill rates. A hydrological assessment of the reservoir has not been done as part of this analysis but would be recommended to verify that the recharge rate of the lake would continue to meet WMWS demands under future conditions, such as increased drought conditions due to climate change.

Option 2 is dependent on continued availability of supply from the JdF WDS. On-site O&M at the new booster pump station would be required, but the level of effort is expected to be significantly lower than that required for a full water treatment plant.

Another potential risk to the long-term sustainability of Option 2 is maintaining access, including access rights, to the mains through properties owned by others. There may be an opportunity to route the water main through Crown Land as opposed to private property. Refining water main routing, and securing utility right of ways ,would be an early priority if Option 2 is pursued.

6 SUMMARY AND RECOMMENDATIONS

6.1 Summary

Two viable drinking water supply options for the WMWS were evaluated: continued reliance on the current source with treatment upgrades or connection to the CRD's JdF WDS.

Option 1A – DAF Treatment Upgrade

- Decommission exciting treatment units and introduce chemical pre-treatment, DAF followed by multimedia filtration (Greensand Plus or equivalent) and chlorine disinfection.
- Provides robust treatment with effective removal of turbidity, organics, algae, iron, and manganese.
- Requires significant capital investment and largest site footprint of the examined options.
- Moderate operational complexity with chemical handling and residuals management.
- Requires consistent onsite presence by operations staff for O&M duties and disposal of residuals.

Option 1B – Roughing and Cartridge Filtration Upgrade

- Add chemical pre-treatment, roughing filter and multimedia filtration (Greensand Plus or equivalent) to the existing facility.
- Lower capital cost and simpler implementation using existing infrastructure.
- The proposed combination of treatment is not commonly used in BC, and piloting would be strongly recommended to verify performance.
- Near-daily onsite attendance by operations staff required for frequent replacement of cartridge filters, plus consistent presence for other O&M duties including disposal of residuals.
- Low operational complexity with chemical handling and residuals management.

Option 2 – Connection to Juan de Fuca Water Distribution System

- Provides access to consistent, high-quality treated water from an existing CRD drinking water supply system.
- Eliminates need for a dedicated treatment plant and reduces onsite operational complexity.
- Lowest lifecycle cost driven by minimal O&M requirements.
- Requires new transmission infrastructure with constructability challenges (steep slopes, private land access).
- Additional work required to determine an appropriate level of integration between WMWS and the JdF WDS.

Lifecycle Costs

The 25-year lifecycle costs for each option are presented below. These values are Class D Opinion of Probable Cost with an accuracy of +/- 50%.

- Option 1A – DAF Treatment Upgrade: $11,101,000
- Option 1B – Roughing and Cartridge Filtration Upgrade: $11,218,000
- Option 2 – Connection to the JdF WDS: $8,075,000

6.2 Recommendation

Based on this evaluation, connection to the JdF WDS from Rocky Point via Matheson Lake (Option 2) is recommended for the WMWS. This option provides a reliable water supply from an existing water supply system and removes reliance on the Wilfred Reservoir and local treatment infrastructure on the WMWS site.

6.3 Next Steps

The Option 2 concept, as presented in the Colquitz (2018) report, is based on a high-level assessment and would require a more detailed assessment of the water main route. If this option is selected for implementation, it is recommended that a more detailed concept of the water main route be developed.

In addition, the following key activities should be undertaken:

- Verify the impacts that current and future water demands from the WMWS would have on holding times and water pressure within the existing JdF WDS.
- Determine whether fire flows to WMWS are to be provided locally via the existing WMWS reservoirs, or directly from the JdF WDS.
- Refine water main routing and secure land acquisitions or right-of-ways for pipeline installation across private properties and/or Crown Land.
- Review water quality of the JdF WDS to confirm whether any additional treatment would be recommended.
- Verify geotechnical conditions and presence of archaeological sites along the proposed water main route.
- Obtain all necessary permits and approvals for construction, including environmental and regulatory approvals.
- Review whether additional upgrades would be required for WMWS to meet JdF WDS standards and determine preferred governance structure based on these findings.

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TECHNICAL MEMORANDUM

7 CLOSURE

The services provided by Associated Engineering (B.C.) Ltd. in the preparation of this technical memorandum were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practising under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,

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Enclosure:

- Appendix A – Cost Estimate

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Appendix A-1A- Opinion of Probable Cost (Class D) for Dissolved Air Flotation System
09-Sep-26
2021-2386

Item	Description	Unit	Quantity	Rate	Total Cost ($)
1	**General**				
1.1	Bonding and Insurance	Lump Sum	1	2.0%	$ 73,492.50
1.2	Mobilization and Demobilization	Lump Sum	1	4.0%	$ 146,985.00
1.3	Layout and Survey Control	Lump Sum	1	$ 8,000	$ 8,000
1.4	Landscaping/Arborist Services	Lump Sum	1	$ 2,000	$ 2,000
	Subtotal for Task				$ 230,478
2	**Raw Water Supply Main**				
2.1	100 mm PVC watermain	m	275	$ 600	$ 165,000
2.2	Trench Rock (2/3 of excavation)	m3	120	$ 300	$ 36,000
2.3	Upgrade and Relocate Intake (Allowance)	Lump Sum	1	$ 500,000	$ 500,000
	Subtotal for Task				$ 701,000
3	**Water Treatment Plant**		1		
3.1	DAF Treatment Plant (4.1 L/s)	Lump Sum	1	$ 2,768,625	$ 2,768,625
3.2	Mech/Elect/Civil materials & installation	Lump Sum	1	$ 35,000	$ 35,000
3.3	Chlorine Contact Tank	Lump Sum	1	$ 55,000	$ 55,000
3.4	Piloting Option (1 month)	Lump Sum	1	$ 115,000	$ 115,000
	Subtotal for Task		1		$ 2,973,625
4	**Removals**				$ -
4.1	Remove existing equipment in WTP	Lump Sum	1	$ 75,000	$ 75,000
	Subtotal for Task				$ 75,000
5	**Upgrades to WMWS**				
5.1	Install water meters at each service connection	Each	74	$ 2,500	$ 185,000
					$ 185,000
	Tasks Subtotal				$ 4,165,103
	CRD Administration and Operations	10%			$ 416,510
	Engineering	15%			$ 624,765
	Contingency	40%			$ 1,666,041
	Subtotal				$ 6,872,419
	Total Amount Rounded (exc. GST)				**$ 6,870,000**

APPENDIX B

Appendix A-1A- DAF Water Treatment System 25-year Lifecycle Costs Calculation

09-Sep-26
2021-2386

Discount Rate 4.0%

Dissolved Air Flotation (DAF)		
Capital Cost	$	6,870,000
Annual WTP Operation Expenses	$	167,988
Annual Expenses for Existing Infrastructure	$	100,000
Replacement Costs		
Chemical pumps	$6,000 ea	
Backwash, recycle pumps and compressors	$40,000 LS	
Catalytic media	$15,000 LS	
25-Year Lifecycle Costs	**$**	**11,101,000**

Appendix A-1A- DAF Water Treatment System 25-year Lifecycle Costs Calculation

Year	Capital Cost	Annual Cost	Subtotal (FV)	Subtotal (PV)
0	$ 6,870,000.00	$0.00	$ 6,870,000.00	$6,870,000.00
1		$ 267,988	$ 267,987.90	$257,680.67
2		$ 267,988	$ 267,987.90	$247,769.88
3		$ 267,988	$ 267,987.90	$238,240.27
4		$ 267,988	$ 267,987.90	$229,077.18
5		$ 267,988	$ 267,987.90	$220,266.52
6		$ 267,988	$ 267,987.90	$211,794.73
7		$ 267,988	$ 267,987.90	$203,648.78
8		$ 267,988	$ 267,987.90	$195,816.13
9		$ 267,988	$ 267,987.90	$188,284.74
10	$ 48,000.00	$ 267,988	$ 315,987.90	$213,470.10
11		$ 267,988	$ 267,987.90	$174,079.83
12		$ 267,988	$ 267,987.90	$167,384.45
13		$ 267,988	$ 267,987.90	$160,946.59
14		$ 267,988	$ 267,987.90	$154,756.33
15	$ 50,000.00	$ 267,988	$ 317,987.90	$176,567.39
16		$ 267,988	$ 267,987.90	$143,080.93
17		$ 267,988	$ 267,987.90	$137,577.82
18		$ 267,988	$ 267,987.90	$132,286.36
19		$ 267,988	$ 267,987.90	$127,198.43
20	$ 48,000.00	$ 267,988	$ 315,987.90	$144,212.75
21		$ 267,988	$ 267,987.90	$117,602.10
22		$ 267,988	$ 267,987.90	$113,078.94
23		$ 267,988	$ 267,987.90	$108,729.75
24		$ 267,988	$ 267,987.90	$104,547.83
25		$ 167,988	$ 167,987.90	$63,015.08

$11,101,113.60

Appendix A-1B- Opinion of Probable Cost (Class D) for WMWSCC-Proposed Water Treatment System
09-Sep-26
2021-2386

Item	Description	Unit	Quantity		Rate		Total Cost ($)
1	**General**						
1.1	Bonding and Insurance	Lump Sum	1		2.0%	$	29,600
1.2	Mobilization and Demobilization	Lump Sum	1		4.0%	$	59,201
1.3	Layout and Survey Control	Lump Sum	1	$	11,300	$	11,300
1.4	Landscaping/Arborist Services	Lump Sum	1	$	4,520	$	4,520
	Subtotal for Task					$	104,621
2	**Raw Water Supply Main**						
2.1	100 mm PVC Pipe Water Main	m	275	$	600	$	165,000
2.2	Trench Rock (2/3 of excavation)	m3	120	$	300	$	36,000
2.3	Upgrade and Relocate Intake (Allowance)	Lump Sum	1	$	500,000	$	500,000
	Subtotal for Task					$	701,000
3	**Treatment System and Piloting**						
3.1	Roughing Filters	Lump Sum	1	$	125,080	$	125,080
3.2	Hurricane 5-micron Filters (HC/90-5)	ea	2	$	3,450	$	6,900
3.3	Hurricane 0.35-micron filters (HC/90-0.35)	ea	2	$	2,875	$	5,750
3.4	Harmsco WB 90SC-2 filter housings	ea	4	$	20,700	$	82,800
3.5	UV Reactors	Lump Sum	1	$	372,042	$	372,042
3.6	Mech/Elect/Civil materials & installation	Lump Sum	1	$	90,400	$	90,400
3.7	Waste Holding Tank	Lump Sum	1	$	33,900	$	33,900
3.8	Chlorine Contact Tank	Lump Sum	1	$	62,150	$	62,150
3.9	Allowance for greensand vessels	Lump Sum	1	$	120,000	$	120,000
3.1	Piloting Option (1 month)	Lump Sum	1	$	115,000	$	115,000
	Subtotal for Task					$	1,014,022
4	**Removals**						
4.1	Remove existing equipment in WTP	Lump Sum	1	$	75,000	$	75,000
	Subtotal for Task					$	75,000
5	**Upgrades to WMWS**						
5.1	Install water meters at each service connection	Each	74	$	2,500	$	185,000
	Subtotal for Task					$	185,000
	Tasks Subtotal					$	2,079,643
	CRD Administration and Operations	10%				$	207,964
`	Engineering	15%				$	311,946
	Contingency	40%				$	831,857
	Subtotal					$	3,431,411
	Total Amount Rounded (exc. GST)					**$**	**3,430,000**

APPENDIX B

Appendix A-1B - Roughing and Cartridge Filtration Water Treatment System 25-year Lifecycle Costs Calculation

09-Sep-26
2021-2386

Discount Rate 4.0%

Roughing and Cartridge Filters		
Capital Cost	$	3,430,000
Annual WTP Operating Costs		
Labour	$	164,100
Chemicals	$	3,000
Power	$	1,600
Cartridge Replacement	$	213,700
UV lamp replacement	$	5,500
Misc. Mechanical	$	3,200
Misc. Electrical	$	1,700
Subtotal	$	392,800
Annual Expenses for Existing Infrastructure	$	100,000
Replacement Costs		
Chemical pumps	$6,000 ea	
Backwash pumps and compressors	$30,000 LS	
UV ballasts	$1500 ea	
UV sleeves	$400 ea	
Media replacement	$10,000 LS	
25-Year Lifecycle Costs	**$**	**11,218,000**

Appendix A-1B - Roughing and Cartridge Filtration Water Treatment System 25-year Lifecycle Costs Calculation

Year	Capital Cost	Annual Cost	Subtotal (FV)	Subtotal (PV)
0	$ 3,430,000.00	$0.00	$ 3,430,000.00	$3,430,000.00
1		$ 492,800	$ 492,800.00	$473,846.15
2		$ 492,800	$ 492,800.00	$455,621.30
3		$ 492,800	$ 492,800.00	$438,097.41
4		$ 492,800	$ 492,800.00	$421,247.51
5	$ 3,000.00	$ 492,800	$ 495,800.00	$407,511.46
6		$ 492,800	$ 492,800.00	$389,467.00
7		$ 492,800	$ 492,800.00	$374,487.50
8		$ 492,800	$ 492,800.00	$360,084.13
9		$ 492,800	$ 492,800.00	$346,234.74
10	$ 60,600.00	$ 492,800	$ 553,400.00	$373,857.21
11		$ 492,800	$ 492,800.00	$320,113.48
12		$ 492,800	$ 492,800.00	$307,801.43
13		$ 492,800	$ 492,800.00	$295,962.91
14		$ 492,800	$ 492,800.00	$284,579.72
15	$ 33,000.00	$ 492,800	$ 525,800.00	$291,958.08
16		$ 492,800	$ 492,800.00	$263,109.95
17		$ 492,800	$ 492,800.00	$252,990.34
18		$ 492,800	$ 492,800.00	$243,259.94
19		$ 492,800	$ 492,800.00	$233,903.79
20	$ 60,600.00	$ 492,800	$ 553,400.00	$252,564.54
21		$ 492,800	$ 492,800.00	$216,257.20
22		$ 492,800	$ 492,800.00	$207,939.61
23		$ 492,800	$ 492,800.00	$199,941.94
24		$ 492,800	$ 492,800.00	$192,251.86
25		$ 492,800	$ 492,800.00	$184,857.56

$11,217,946.74

Appendix A-2 - Opinion of Probable Cost (Class D) for OPTION 2 - ROCKY POINT SUPPLY VIA MATHESON LAKE
09-Sep-26
2021-2386

Item	Description	Unit	Quantity	Rate	Total Cost ($)
1	**General**				
1.1	Bonding and Insurance	Lump Sum	1	2.0%	$ 67,832.00
1.2	Mobilization and Demobilization	Lump Sum	1	4.0%	$ 135,664.00
1.3	Layout and Survey Control	Lump Sum	1	$ 10,000	$ 10,000
1.4	Landscaping/Arborist Services	Lump Sum	1	$ 10,000	$ 10,000
1.5	Traffic Management	Lump Sum	1	$ 10,000	$ 10,000
	Subtotal for Task				$ 233,496
2	**Matheson Lake Road Watermain**				
2.1	150 mm PVC watermain	m	830	$ 1,000	$ 830,000
2.2	Trench Rock (2/3 of excavation)	m3	350	$ 300	$ 105,000
2.3	Fire hydrant and lead	Each	0	$ 8,500	$ -
2.4	Services	Each	0	$ 2,500	$ -
	Subtotal for Task				$ 935,000
3	**Booster Pump Station**				
3.1	Base Facility Cost	Lump Sum	1	$ 400,000	$ 400,000
3.2	2 x 70 HP pump station	Each	2	$ 100,000	$ 200,000
3.3	Relocated chlorine and ammonia dosing equipment	Lump Sum	1	$ 25,000	$ 25,000
	Subtotal for Task				$ 625,000
4	**Private Property - Open Cut - Matheson Lake**				
4.1	150mm PVC watermain (gravel surface)	m	550	$ 1,000	$ 550,000
4.2	Trench Rock (2/3 of excavation)	m3	230	$ 300	$ 69,000
4.3	Fire hydrant and lead	Each	0	$ 8,500	$ -
4.4	Services	Each	0	$ 2,500	$ -
	Subtotal for Task				$ 619,000
5	**Private Property - Directional Drilling**				
5.1	150mm HDPE watermain (c/w 8" steel sleeve)	m	600	$ 1,800	$ 1,080,000
5.2	Landing for drilling equipment and preparation	Lump Sum	1	$ 20,000	$ 20,000
	Subtotal for Task				$ 1,100,000
6	**Private Property - Open Cut - Cains**				
6.1	150mm PVC watermain (gravel surface)	m	100	$ 1,000	$ 100,000
6.2	Trench Rock (2/3 of excavation)	m3	42	$ 300	$ 12,600
	Subtotal for Task				$ 112,600
7	**Allowance for Property Purchase**				
7.1	Property Purchase Cost - Mathesons Lake	Lump Sum	1	$ 25,000	$ 25,000
7.2	Property Purchase Cost - Cains	Lump Sum	1	$ 25,000	$ 25,000
	Subtotal for Task				$ 50,000
8	**Removals**				$ -
8.1	Remove existing treatment works - intake and WTP	Lump Sum	1	$ 120,000	$ 120,000
8.2	Decommissioning of existing dams	Lump Sum	1	$ 600,000	$ 600,000
	Subtotal for Task				$ 720,000
9	**Upgrades to WMWS**				
9.1	Install water meters at each service connection	Each	74	$ 2,500	$ 185,000
	Subtotal for Task				$ 185,000
	Tasks Subtotal				$ 4,530,096
	CRD Administration and Operations	10%			$ 453,010
	Engineering	15%			$ 679,514
	Contingency	40%			$ 1,812,038
	Subtotal				$ 7,474,658
	Total Amount, Rounded (exc. GST)				**$ 7,470,000**

APPENDIX B

Appendix A-2 - Opinion of Probable Cost (Class D) for OPTION 2 - ROCKY POINT SUPPLY VIA MATHESON LAKE
09-Sep-26
2021-2386

Discount Rate 4.0%

ROCKY POINT SUPPLY VIA MATHESON LAKE		
Capital Cost	$	7,470,000
Annual Operation Expenses	$	38,750
Replacement Costs		
Pumps in Booster Pump Station	$	200,000
25-Year Lifecycle Costs	**$**	**8,075,000**

Appendix A-2 - Opinion of Probable Cost (Class D) for OPTION 2 - ROCKY POINT SUPPLY VIA MATHESON LAKE

Year	Capital Cost	Annual Cost	Subtotal (FV)	Subtotal (PV)
0	$ 7,470,000.00	$0.00	$ 7,470,000.00	$7,470,000.00
1		$ 38,750	$ 38,750.00	$37,259.62
2		$ 38,750	$ 38,750.00	$35,826.55
3		$ 38,750	$ 38,750.00	$34,448.61
4		$ 38,750	$ 38,750.00	$33,123.66
5		$ 38,750	$ 38,750.00	$31,849.68
6		$ 38,750	$ 38,750.00	$30,624.69
7		$ 38,750	$ 38,750.00	$29,446.82
8		$ 38,750	$ 38,750.00	$28,314.25
9		$ 38,750	$ 38,750.00	$27,225.24
10		$ 38,750	$ 38,750.00	$26,178.11
11		$ 38,750	$ 38,750.00	$25,171.26
12		$ 38,750	$ 38,750.00	$24,203.14
13		$ 38,750	$ 38,750.00	$23,272.25
14		$ 38,750	$ 38,750.00	$22,377.16
15		$ 38,750	$ 38,750.00	$21,516.50
16		$ 38,750	$ 38,750.00	$20,688.94
17		$ 38,750	$ 38,750.00	$19,893.21
18		$ 38,750	$ 38,750.00	$19,128.09
19		$ 38,750	$ 38,750.00	$18,392.39
20		$ 38,750	$ 38,750.00	$17,684.99
21		$ 38,750	$ 38,750.00	$17,004.80
22		$ 38,750	$ 38,750.00	$16,350.77
23		$ 38,750	$ 38,750.00	$15,721.90
24		$ 38,750	$ 38,750.00	$15,117.21
25		$ 38,750	$ 38,750.00	$14,535.78

$8,075,355.60

Making a difference...together

REPORT TO WILDERNESS MOUNTAIN WATER SERVICE COMMISSION
MEETING OF NOVEMBER 19, 2026

SUBJECT **Wilderness Mountain Water Service 2027 Operating and Capital Budget**

ISSUE SUMMARY

To present the 2027 Operating and Capital Budget for Commission review and recommendation for the approval of the Capital Regional District (CRD) Board and for inclusion in the CRD Five-Year Financial Plan, in accordance with Bylaw No 3511, "Wilderness Mountain Water Service Commission Bylaw No. 1, 2008".

BACKGROUND

The CRD is required by legislation under the *Local Government Act* (LGA) to prepare an annual operating and capital budget and a five-year financial plan including Operating Budgets and Capital Expenditure Plans annually. CRD staff have prepared the financial plan shown in Appendix A for the Wilderness Mountain Water Service.

The Operating Budget includes the regular annual costs to operate the service. The Capital Expenditure Plan shows the anticipated expenditure for capital additions. These may include purchases of new assets or infrastructure as well as upgrades or improvements to existing assets.

In preparing the Operating Budget, CRD staff considered:

- Actual expenditures incurred between 2024 and 2026.
- Anticipated changes in level of service (if any).
- Maximum allowable tax requisition.
- Annual cost per taxpayer and per Single Family Equivalent (SFE).

Factors taken into consideration in the preparation of the Capital Expenditure Plan included:

- Available funds on hand.
- Projects already in progress.
- Condition of existing assets and infrastructure.
- Regulatory, environmental, and health and safety factors.

Adjustments for surpluses or deficits from 2026 may be made in January 2027. The CRD Board will give final approval to the budget and financial plan in March 2027.

The Financial Plan for years 2028 to 2031 may be changed in future years.

BUDGET OVERVIEW

Operating Budget

It is projected that 2026 operating expenses will be approximately $25,388 over budget. Factors contributing to the operating overage include emergency water main repair and a water service repair, two boil water advisories resulting in additional staff time, and increased filter replacements.

It is projected that the 2026 operating revenue will be on budget with a minor $100 surplus.

Consequently, there is an overall operating deficit of approximately $25,288 ($25,388 - $100). To balance the budget at year-end, the actual deficit may be addressed through reduced 2026 contributions to the Capital Reserve Fund (CRF) and/or Operating Reserve Fund (ORF), funding from the ORF, a carry-forward to the 2027 budget as an expenditure in accordance with the LGA Section 374(11), or a combination of these options. Based on current projections, the deficit forecast of $25,288 will be carried forward to the 2027 budget.

The 2027 core operating budget of $173,436 represents an increase of $30,862 (21.6%) over the 2026 budget of $142,547. The increase is primarily to account for inflation and increased labour, supply and maintenance costs. The increase reflects core operating costs only and excludes one-time cyclical maintenance activities and emergency repairs funded through the ORF. In 2026, ORF funded projects totaling $16,000 included valve exercising and emergency electrical repairs. 2027 ORF funded projects total $10,000 and include reservoir cleaning and inspection.

Municipal Finance Authority (MFA) Debt

Loan Authorization Bylaw 3504 (LA3504), to borrow $281,000, was approved and adopted in 2008 to upgrade/construct water supply and distribution facilities in the Wilderness Mountain Service Area. Table 1 below summarizes the detailed information for existing MFA debt issue related to LA3504.

Table 1 – Existing Debt Summary

MFA Issues	Term	Borrowing Year	Retirement Year	Refinance Year	Original Interest Rate	Current Interest Rate	Principal	Principal Payment	Interest Payment	Total Annual Debt Cost
LA3504-118	15	2012	2027	2022	3.40%	3.39%	$281,000	$16,138	$9,526*	$25,664

**Spring Borrowing, Interest payment in 2027 – debt retirement year – is only half ($4,763).*

Operating Reserve Fund

The ORF is used to fund cyclical maintenance activities, supplies and equipment purchases that typically do not occur on an annual basis to mitigate the swings in expense and revenue requirement year over year. Typical maintenance activities include hydrant/standpipe maintenance, reservoir cleaning and inspection and ground water well servicing. Additionally, the ORF is used to respond to unforeseen events and operating emergencies.

The ORF transfers planned in the budget are evaluated and guided by the CRD Operating Reserve Guidelines endorsed by the CRD Board. The target balance for the service ranges from $34,000 to $76,000.

It is proposed that the 2027 transfers to the operating reserve be set at $10,050. The ORF balance at the end of 2026 is projected to be approximately $5,636. There is $38,000 planned maintenance to be funded by the ORF over the next five years.

Capital Reserve Fund

The CRF is to be used to pay for capital expenditures that are not funded by other sources such as grants, operating budget, or debt. The CRF transfers planned in the budget are evaluated and influenced by the funding required to support the five-year capital expenditure plan and the emergency response to infrastructure failures. CRF transfers are guided by the CRD Capital Reserve Funding Guidelines endorsed by the CRD Board. The target balance to be maintained for the service is approximately $319,000.

It is proposed that the budgeted transfer to the CRF be set at $12,500 in 2027. The balance of the CRF at the end of 2026 is projected to be approximately $15,805.

Capital Expenditure Plan

The five-year capital plan includes $7,460,200 of expenditure to be funded by a combination of the service's CRF, grant funding, and new debt (debt funded projects are not approved until after a Petition or Alternate Approvals Process is complete).

A complete list of the capital projects can be found in Appendix A, but some of the most significant capital projects being proposed include:

- A Petition or Alternative Approval Process (24-03) is proposed to be funded through the CRF for a total of $10,000 in 2027 and is required to obtain elector input on borrowing strategies for multiple projects that have been identified with a debt funding source.
- New Floating Intake (25-01), proposed as a combination of new debt and grant, with the intent that grant applications will be attempted if available.
- Treatment Plant Upgrades (25-02), at the request of the Commission to improve the Treatment Plant.
- Island Health Compliance – Capital Improvements (27-01), a placeholder budget proposed as a combination of debt and grant funding (if successful) to carry out capital improvements recommended from the options analysis.
- Replacement of the Wilfred Brook North Dam Outlet Gate (27-02) due to deteriorating condition.
- An Asset Management Study (27-03) is proposed to reassess assets in the service and support future capital planning and the petition process.

For the purpose of discussion and analysis, finance staff have simulated the future debt servicing costs in Table 2 below. The indicative interest rate is provided by the MFA at the time of simulation. The debt-servicing simulation is for four projects totaling $2,208,200. These debt-funded projects require approval by the rate payers and will only be carried out upon receiving electoral consent. Please refer to the 2027 through 2031 Five-Year Capital Plan for details.

Table 2 – Future New Debt (Unapproved) Simulation

	Term	Borrowing Year	Retirement Year	Estimated Interest Rate	Principal	Principal Payment	Interest Payment	Total Annual Debt Cost
Future Borrowing(s) Estimation	25	2028	2053	4.90%	$808,200	$20,612	$39,602	$60,214
	25	2029	2054	4.90%	$700,000	$17,853	$34,300	$52,153
	25	2030	2055	4.90%	$700,000	$17,853	$34,300	$52,153
Total					**$2,208,200**	**$56,318**	**$108,202**	**$164,520**

At the commencement of each loan, 1% of the gross amount borrowed is withheld and retained by MFA as Debt Reserve Fund (DRF). To provide the full amount to fund the capital project, this 1% DRF amount is budgeted in the operating budget in the year of borrowing. However, there is no principal payment required in the year of borrowing. The estimated debt servicing cost of $164,520 equates to approximately $2,031.11 cost per parcel.

Capital Projects Fund
As specific capital projects are approved, the funding revenues for them are transferred into this Capital Projects Fund from multiple funding sources if applicable, including CRF, grant funding, external contributions, and debt. Any funds remaining upon completion of a project will be transferred back to its original funding source(s).

User Charge and Parcel Tax
The service is funded by parcel tax, fixed user charges, and fixed water consumption charge. Properties connected to the water system pay the annual user charge and water consumption charge, and all properties within the local service area are responsible for the parcel tax.

The 2027 water rate for consumption charge has increased to $379.33 per SFE compared to $321.35 per SFE in 2026.

Table 3 below summarizes the 2027 over 2026 changes for parcel tax, user charge and fixed water consumption charge.

Table 3 – Parcel Tax, User Charge and Water Consumption Charge Summary

Budget Year	Parcel Tax	Taxable Folios	Parcel Tax per Folio*	User Charge	SFE** Numbers	User Charge per SFE	Water Consumption Charge per SFE	Total Charges
2026	$82,920	81	$1,077.45	$98,410	74	$1,329.85	$321.35	**$2,728.65**
2027	$97,885	81	$1,271.90	$116,170	74	$1,569.88	$379.33	**$3,221.11**
Change ($)	$14,965	0	$194.45	$17,760	0	$240.03	$57.98	**$492.46**
Change (%)	18.05%	0.0%	18.05%	18.05%	0.0%	18.05%	18.04%	**18.05%**

** Includes the 5.25% admin fee charged by the Ministry of Finance (not CRD revenue)*
*** Single Family Equivalent*

The 2027 fixed user charge and fixed water consumption charge per SFE, based on the budget presented, will be included in the fees and charges bylaw for approval by the CRD Board to be effective January 2027.

ALTERNATIVES

Alternative 1
The Wilderness Mountain Water Service Commission recommends the Electoral Areas Committee recommend to the Capital Regional District Board:
That the 2027 Operating and Capital Budget and the Five-Year Financial Plan for the Wilderness Mountain Water Service be approved as presented.

Alternative 2
The Wilderness Mountain Water Service Commission recommends the Electoral Areas Committee recommend to the Capital Regional District Board:
That the 2027 Operating and Capital Budget and the Five-Year Financial Plan for the Wilderness Mountain Water Service be approved as amended.

RECOMMENDATION

The Wilderness Mountain Water Service Commission recommends the Electoral Areas Committee recommend to the Capital Regional District Board:
That the 2027 Operating and Capital Budget and the Five-Year Financial Plan for the Wilderness Mountain Water Service be approved as presented.

Submitted by:	Iain Lawrence, MCIP, RPP, Senior Manager, Juan de Fuca Administration
Concurrence:	Nelson Chan, MBA, FCPA, FCMA, Chief Financial Officer & General Manager, Finance & Technology
Concurrence:	Stephen Henderson, General Manager, Electoral Area Services
Concurrence:	Ted Robbins, B. Sc., C. Tech., Chief Administrative Officer

ATTACHMENT(S)

Appendix A: 2027 Budget Wilderness Mountain Water Service Budget

CAPITAL REGIONAL DISTRICT

2027 Budget

Wilderness Mountain Water

Commission Review

NOVEMBER 2026

Service: 2.691 Wilderness Mountain Water Service **Committee:** Electoral Areas

DEFINITION:

To finance, operate and maintain the supply, conveyance, treatment, storage and distribution of water to the Wilderness Mountain Local Service area that is within the JDF Electoral Area. The service was established by Bylaw No. 3511, adopted on July 9, 2008.

PARTICIPATION:

Wilderness Mountain Local Service Area

MAXIMUM LEVY:

Greater of $130,000 or $3.27/ $1,000 of actual assessed value of land and improvements.

MAXIMUM CAPITAL DEBT:

Maximum Authorized:	$281,000	(MFA Bylaw No.3504, Wilderness Mountain Water Service adopted on May 14, 2008)
Borrowed:	$281,000	(MFA Bylaw No.3504, Wilderness Mountain Water Service)

COMMISSION:

Wilderness Mountain Water Service Commission established by Bylaw No. 3511 (July 9, 2008).

FUNDING:

Consumption Charge:
Water Consumption charge will be collected from each Single Family Equivalent connected to the water system

User Charge:
Collected as a fixed user fee charged quarterly to each Single Family Equivalent connected to the system

Parcel Tax:
Charged to each taxable parcel in the service area whether connected or not.

RESERVE FUND # 1075:

Approved by Bylaw No. 3535 adopted on November 12, 2008.

APPENDIX A

2.691 - Wilderness Mountain Water	2026 BOARD BUDGET	2026 ESTIMATED ACTUAL	BUDGET REQUEST 2027 CORE BUDGET	2027 ONGOING	2027 ONE-TIME	2027 TOTAL	FUTURE PROJECTIONS 2028	2029	2030	2031
OPERATING COSTS										
Contract for Services	17,010	17,000	6,010	-	10,000	16,010	10,130	16,250	10,380	16,510
Allocations	11,612	11,612	11,723	-	-	11,723	11,986	12,248	12,526	12,809
Electricity	7,450	7,450	7,450	-	-	7,450	7,600	7,750	7,910	8,070
Supplies	27,400	52,120	52,240	-	-	52,240	53,280	54,350	55,440	56,550
Labour Charges	80,926	82,000	81,318	-	-	81,318	82,950	84,610	86,300	88,030
Insurance	1,940	1,940	2,210	-	-	2,210	2,322	2,439	2,562	2,691
Water Testing	10,046	9,500	10,294	-	-	10,294	10,556	10,824	11,097	11,386
Other Operating Expenses	2,190	2,340	2,191	-	-	2,191	2,229	2,270	2,311	2,350
TOTAL OPERATING COSTS	**158,574**	**183,962**	**173,436**	**-**	**10,000**	**183,436**	**181,053**	**190,741**	**188,526**	**198,396**
*Percentage Increase over prior year			9.37%		6.3%	15.7%	-1.3%	5.4%	-1.2%	5.2%
DEBT / RESERVES										
Transfer to Capital Reserve Fund	21,000	21,000	12,500	-	-	12,500	41,550	25,000	25,000	25,000
Transfer to Operating Reserve Fund	15,922	15,922	10,050	-	-	10,050	17,695	15,475	17,320	19,190
EXISTING DEBT										
MFA Debt Reserve Fund	130	130	120	-	-	120	-	-	-	-
MFA Debt Principal	16,138	16,138	16,138	-	-	16,138	-	-	-	-
MFA Debt Interest	9,526	9,526	4,763	-	-	4,763	-	-	-	-
PLANNED DEBT										
MFA Debt Reserve Fund	-	-	-	-	-	-	8,082	7,000	7,000	-
MFA Debt Principal	-	-	-	-	-	-	-	20,612	38,465	56,317
MFA Debt Interest	-	-	-	-	-	-	9,900	48,177	82,477	108,202
TOTAL DEBT / RESERVES	**62,716**	**62,716**	**43,571**	**-**	**-**	**43,571**	**77,227**	**116,264**	**170,262**	**208,709**
TOTAL COSTS	**221,290**	**246,678**	**217,007**	**-**	**10,000**	**227,007**	**258,280**	**307,005**	**358,788**	**407,105**
*Percentage Increase over prior year			-1.94%		4.5%	2.6%	13.8%	18.9%	16.9%	13.5%
FUNDING SOURCES (REVENUE)										
Estimated Balance c/fwd from 2026 to 2027	-	(25,288)	25,288	-	-	25,288	-	-	-	-
Transfer from Operating Reserve Fund	(16,000)	(16,000)	-	-	(10,000)	(10,000)	(4,000)	(10,000)	(4,000)	(10,000)
User Charges	(98,410)	(98,410)	(116,170)	-	-	(116,170)	(121,980)	(125,640)	(128,150)	(130,710)
Sale - Water	(23,780)	(23,780)	(28,070)	-	-	(28,070)	(29,470)	(30,350)	(30,960)	(31,580)
Other Revenue	(180)	(280)	(170)	-	-	(170)	(50)	(50)	(50)	(50)
TOTAL REVENUE	**(138,370)**	**(163,758)**	**(119,122)**	**-**	**(10,000)**	**(129,122)**	**(155,500)**	**(166,040)**	**(163,160)**	**(172,340)**
REQUISITION - PARCEL TAX	**(82,920)**	**(82,920)**	**(97,885)**	**-**	**-**	**(97,885)**	**(102,780)**	**(140,965)**	**(195,628)**	**(234,765)**
*Percentage increase over prior year										
User Charge			18.0%			18.0%	5.0%	3.0%	2.0%	2.0%
Water Sale			18.0%			18.0%	5.0%	3.0%	2.0%	2.0%
Requisition			18.0%			18.0%	5.0%	37.2%	38.8%	20.0%
Combined			**18.0%**			**18.0%**	**5.0%**	**16.8%**	**19.5%**	**11.9%**

Wilderness Mountain Reserves
Summary Schedule
2027 - 2031 Financial Plan

Reserve/Fund Summary

	Estimated	Budget				
	2026	2027	2028	2029	2030	2031
Operating Reserve Fund	5,636	5,686	19,381	24,856	38,176	47,366
Capital Reserve Fund	15,805	8,305	49,855	74,855	99,855	124,855
Total	**21,441**	**13,991**	**69,236**	**99,711**	**138,031**	**172,221**

Reserve Schedule

Reserve Fund: 2.691 Wilderness Mountain - Operating Reserve Fund - Bylaw 4242

The Operating Reserve Fund is used to undertake maintenance activities that typically do not occur on an annual basis.

Reserve Cash Flow

Fund:	**1500**	**Estimated**	**Budget**				
Fund Centre:	**105540**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
Beginning Balance		5,614	5,636	5,686	19,381	24,856	38,176
Transfer from Ops Budget		15,922	10,050	17,695	15,475	17,320	19,190
Transfer to Ops for Core Budget		-					
Transfer to Ops Budget		(16,000)	(10,000)	(4,000)	(10,000)	(4,000)	(10,000)
Planned Maintenance Activity		Distribution System Flushing, Valve Exercising, Emergency Electrical Repair	Reservoir Cleaning and Inspection	Distribution System Flushing, Valve Exercising	Reservoir Cleaning and Inspection	Distribution System Flushing, Valve Exercising	Reservoir Cleaning and Inspection
Interest Income*		100					
Ending Balance $		**5,636**	**5,686**	**19,381**	**24,856**	**38,176**	**47,366**

Assumptions/Background:

* Interest in planning years nets against inflation which is not included.

Reserve Schedule

Reserve Fund: 2.691 Wilderness Mountain Water - Capital Reserve Fund - Bylaw 3535

The capital Reserve Fund established to provide for capital expenditures for or in respect of capital projects, land purchases, machinery or equipment necessary for them and extension or renewal of existing capital works or related debt servicing payments.

Reserve Cash Flow

Fund:	1075	Estimated	Budget				
Fund Centre:	101994	2026	2027	2028	2029	2030	2031
Beginning Balance		29,335	15,805	8,305	49,855	74,855	99,855
Transfer from Ops Budget		21,000	12,500	41,550	25,000	25,000	25,000
Transfer from Cap Fund		-					
Transfer to Cap Fund		(35,000)	(20,000)	-	-	-	-
Interest Income*		470					
Ending Balance $		**15,805**	**8,305**	**49,855**	**74,855**	**99,855**	**124,855**

Assumptions/Background:

* Interest in planning years nets against inflation which is not included.

CAPITAL REGIONAL DISTRICT

FIVE YEAR CAPITAL EXPENDITURE PLAN SUMMARY - 2027 to 2031

Service No. 2.691 Wilderness Mountain Water Service	Carry Forward from 2026	2027	2028	2029	2030	2031	TOTAL
EXPENDITURE							
Buildings	$0	$0	$0	$0	$0	$0	$0
Equipment	$0	$0	$0	$0	$0	$0	$0
Land	$0	$0	$0	$0	$0	$0	$0
Engineered Structures	$0	$20,000	$808,200	$5,932,000	$700,000	$0	$7,460,200
Vehicles	$0	$0	$0	$0	$0	$0	$0
	$0	**$20,000**	**$808,200**	**$5,932,000**	**$700,000**	**$0**	**$7,460,200**
SOURCE OF FUNDS							
Capital Funds on Hand	$0	$0	$0	$0	$0	$0	$0
Debenture Debt (New Debt Only)	$0	$0	$808,200	$700,000	$700,000	$0	$2,208,200
Equipment Replacement Fund	$0	$0	$0	$0	$0	$0	$0
Grants (Federal, Provincial)	$0	$0	$0	$5,232,000	$0	$0	$5,232,000
Donations / Third Party Funding	$0	$0	$0	$0	$0	$0	$0
Reserve Fund	$0	$20,000	$0	$0	$0	$0	$20,000
	$0	**$20,000**	**$808,200**	**$5,932,000**	**$700,000**	**$0**	**$7,460,200**

Definitions for the 5-year Capital Plan

Asset Class	Asset class is used to classify assets for financial reporting in accordance with the Public Sector Accounting Board (PSAB) 3150. **L** - Land **S** - Engineering Structure **B** - Buildings **V** - Vehicles **E** - Equipment
Capital Expenditure Type	Capital expenditure type is used for reporting on asset investments and may be used to justify operational needs for a service. **Study** - Expenditure for feasibility and business case report. **New** - Expenditure for new asset only **Renewal** - Expenditure upgrades an existing asset and extends the service ability or enhances technology in delivering that service **Replacement** - Expenditure replaces an existing asset
Carryforward	Represents the carryforward amount from the prior year capital plan that is remaining to be spent. Forecast this spending over the next 5 years.
Funding Source	**Debt** - Debenture Debt (new debt only) **ERF** - Equipment Replacement Fund **Grant** - Grants (Federal, Provincial) **Cap** - Capital Funds on Hand **Other** - Donations / Third Party Funding **Res** - Reserve Fund **WU** - Water Utility If there is more than one funding source, additional rows are shown for the project.

CAPITAL REGIONAL DISTRICT

5 YEAR CAPITAL PLAN

2027 - 2031

Service #: 2.691

Service Nan Wilderness Mountain Water Service

				PROJECT BUDGET & SCHEDULE									
Project Number	Capital Expenditure Type	Capital Project Title	Capital Project Description	Total Project Budget	Asset Class	Funding Source	Carryforward	2027	2028	2029	2030	2031	5 - Year Total auto-populates
24-03	New	Petition or Alternative Approval Process	Conduct public consultation to inform strategies for a referendum (AAP) to borrow necessary future capital funds, if grant does not provide full funding.	$ 10,000	S	Res	$ -	$ 10,000	$ -	$ -	$ -	$ -	$ 10,000
25-01	New	New Floating Intake	Installation of new floating intake.	$ 145,200	S	Debt	$ -	$ -	$ 13,200	$ -	$ -	$ -	$ 13,200
25-01	New	New Floating Intake	Installation of new floating intake.		S	Grant	$ -	$ -	$ -	$ 132,000	$ -	$ -	$ 132,000
25-02	New	Treatment Plant Upgrades	Upgrades to achieve improve treatment plant	$ 220,000	S	Grant	$ -	$ -	$ -	$ 200,000	$ -	$ -	$ 200,000
25-02	New	Treatment Plant Upgrades	Upgrades to achieve improve treatment plant		S	Debt	$ -	$ -	$ 20,000		$ -	$ -	$ 20,000
27-01	New	Island Health Compliance - Capital Improvements	Tentative budget to carry out capital improvements to bring the water service into compliance with Island Health Requirements based on the recommendation of the Options Analysis. (Assume 70% Grant)	$ 7,000,000	S	Debt	$ -	$ -	$ 700,000	$ 700,000	$ 700,000	$ -	$ 2,100,000
27-01	New	Island Health Compliance - Capital Improvements	Tentative budget to carry out capital improvements to bring the water service into compliance with Island Health Requirements based on the recommendation of the Options Analysis. (Assume 70% Grant)		S	Grant	$ -	$ -	$ -	$ 4,900,000	$ -	$ -	$ 4,900,000
27-02	Renewal	Wilfred Brook North Dam - Outlet Gate Replacement	Replacement of outlet gate due to failing condition.	$ 75,000	S	Debt	$ -	$ -	$ 75,000	$ -	$ -	$ -	$ 75,000
27-03	Study	Asset Management Study	Budget for asset management assessment to support petition process	$ 10,000	S	Res	$ -	$ 10,000	$ -	$ -	$ -	$ -	$ 10,000
													$ -
			Grand Total	**$ 7,460,200**			**$ -**	**$ 20,000**	**$ 808,200**	**$ 5,932,000**	**$ 700,000**	**$ -**	**$ 7,460,200**

Service:	2.691	Wilderness Mountain Water Service

Project Number	24-03	**Capital Project Title**	Petition or Alternative Approval Process	**Capital Project Description**	Conduct public consultation to inform strategies for a referendum (AAP) to borrow necessary future capital funds, if grant does not provide full funding.
Project Rationale	Public engagement for authorization to develop a loan authorization bylaw.				

Project Number	25-01	**Capital Project Title**	New Floating Intake	**Capital Project Description**	Installation of new floating intake.
Project Rationale					

Project Number	25-02	**Capital Project Title**	Treatment Plant Upgrades	**Capital Project Description**	Upgrades to achieve improve treatment plant
Project Rationale					

Project Number	27-01	**Capital Project Title**	Island Health Compliance - Capital Improvements	**Capital Project Description**	Tentative budget to carry out capital improvements to bring the water service into compliance with Island Health Requirements based on the recommendation of the Options
Project Rationale	Capital improvements to bring the water service into compliance with Island Health Requirements.				

Service:	**2.691**	**Wilderness Mountain Water Service**

Project Number	27-02	**Capital Project Title**	Wilfred Brook North Dam - Outlet Gate Replacement	**Capital Project Description**	Replacement of outlet gate due to failing condition.
Project Rationale	Capital improvements to bring the water service into compliance with Island Health Requirements.				

Project Number	27-03	**Capital Project Title**	Asset Management Study	**Capital Project Description**	Budget for asset management assessment to support petition process
Project Rationale					

2.691 - Wilderness Mountain Water

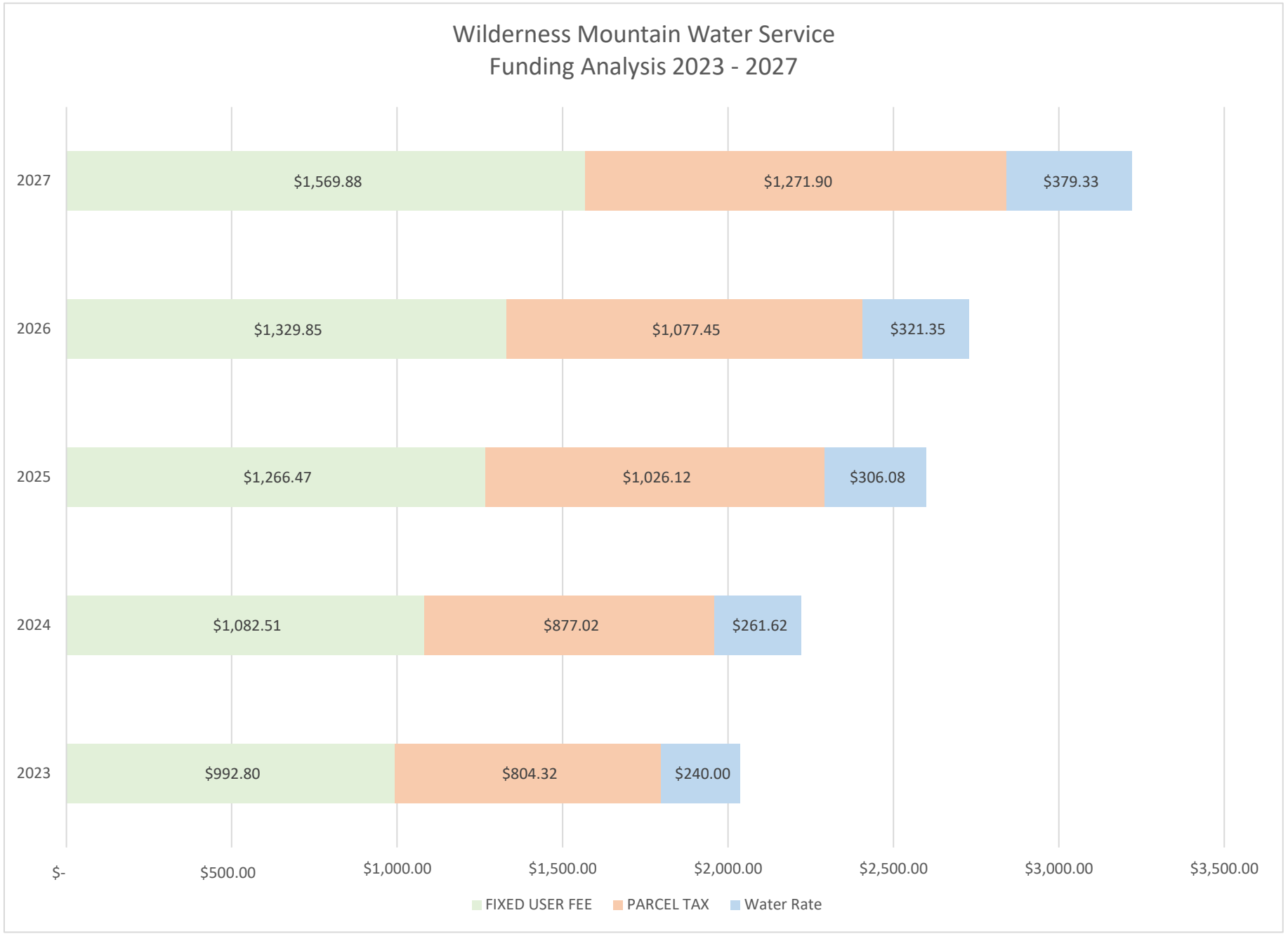
Capital Projects
Updated @ Oct 13, 2026

Year	Project#	Capital Plan#	Status	Capital Project Description	Total Project Budget	Spending		Total Funding in Place
						Expenditure Actuals	Remaining Spending	
2025	CE.731.7001	25-03	Open	SCADA Communication Upgrades	20,000	17,478	2,522	20,000
2026	CE.731.4501	26-01	Open	Island Health Compliance Options	55,000	-	55,000	55,000
				Totals	**75,000**	**17,478**	**57,522**	**75,000**

Service: **2.691** **Wilderness Mountain Water** **Committee: Electoral Areas**

Year	Taxable Folios	Parcel Tax	SFE's	User Charge	Water Rate	Tax & Charges	Bylaw
2023	81	$804.32	74	$992.80	$240.00	**$2,037.12**	4524
2024	81	$877.02	74	$1,082.51	$261.62	**$2,221.15**	4587
2025	81	$1,026.12	74	$1,266.47	$306.08	**$2,598.67**	4649
2026	81	$1,077.45	74	$1,329.85	$321.35	**$2,728.65**	4736
2027	81	$1,271.90	74	$1,569.88	$379.33	**$3,221.11**	
Change from 2026 to 2027		***$194.45***		***$240.03***	**$57.98**	***$492.46***	
		18.05%		***18.05%***	**18.04%**	***18.05%***	

APPENDIX A


Wilderness Mountain Water Service
Funding Analysis 2023 - 2027
2027
$1,569.88
$1,271.90
$379.33
2026
$1,329.85
$1,077.45
$321.35
2025
$1,266.47
$1,026.12
$306.08
2024
$1,082.51
$877.02
$261.62
2023
$992.80
$804.32
$240.00
$-
$500.00
$1,000.00
$1,500.00
$2,000.00
$2,500.00
$3,000.00
$3,500.00
FIXED USER FEE
PARCEL TAX
Water Rate