



LUND WATER SYSTEM CONCERNS

The qathet Regional District (qRD) did not seek to acquire the Lund Waterworks District (LWD) as a strategic expansion. The qRD became involved because the system, its governance, and its infrastructure reached a point where provincial policy, grant funding, public health requirements, and dam safety obligations intersected. The upcoming petition does not decide whether those obligations exist; it decides who is best positioned to manage them.

In 2017, the qRD had a very keen interest in LWD due to the invitation initiated by the LWD to address needed upgrades. As a result, we actively pursued becoming the purveyor of water in Lund. Part of this was engaging in meetings with provincial authorities to understand access to grants and funding streams. As a result of one meeting at the Union of British Columbia Municipalities (UBCM) Convention, where we met with Housing and Municipal Affairs (HMA), they advised us to apply for a 100 per cent eligible cost grant. The Rural and Northern Communities Program grant application failed (2020). When the subsequent 73% per cent grant came along the Board of the day declined to apply because they realized how cost onerous it could be on the part of the water users. The Board did not change their minds until they were encouraged by the Assistant Deputy Minister (ADM) of HMA to apply. That is how we find ourselves in this process today.

Being sensitive to the independence and resilience of Improvement Districts, the qRD learned long ago to tread softly after an innocuous initiative on Texada Island and the experience of how quickly public opinion can flame up into a perceived hostile takeover. The future of LWD lies in the hands of the water users. As it is, the qRD was brought into this process based on the Improvement District Governance: Policy Statement 2006 publication. Contained within it are policies being followed by HMA and the qRD:

- The ministry will take a pro-active approach to restructure improvement districts which:
 - are experiencing problems with their infrastructure;
 - have serious management problems;
 - are facing irreconcilable conflicts with municipalities or regional districts;
 - or
 - are not complying with legislative requirements
- The ministry will encourage and facilitate regional districts assuming greater responsibility for local services in rural areas. The conversion of improvement districts is a two-way street. Both the improvement district and the regional district have to be willing partners. Ministry advisory efforts will be focused largely



on encouraging regional district involvement in providing local services in rural areas and facilitating the transfer process.

- Encourage regional districts to work with improvement districts and to make application for capital infrastructure grants to rehabilitate improvement district water and sewer systems on the assumption that the ownership of the system would shift to the regional district.
- Encourage regional districts to utilize Restructure Implementation Grants to assist with the administrative cost incurred by local governments when they assume responsibility for improvement district services.

Had this been a strategically targeted acquisition, the qRD probably would have went through the efforts of analyzing everything in advance; climate change, groundwater sourcing, etc. However, a key feature of regional district local government finance is its use of separate, discrete budgets for different regional services. Every service provided by a regional district is accounted for separately using a dedicated service fund. Because the budgets are discrete, revenues and costs specific to one service cannot be arbitrarily shifted to or spread among other services. Each regional district service has its own group of participating jurisdictions. Participants in one service are not expected to subsidize, and are not permitted to be subsidized by, participants of other services.

Attempting to perform any analysis then, or even now, would be a difficult task as the qRD, based on how we are legislated to administer finances, does not have access to funding to perform those investigations and research as we do not have an established service from which to draw the required funds. Establishing a service is a journey which eventually requires assent of the electorate. Until that occurs, no taxing authority is available to build up sufficient funding to perform the tasks. A methodical and drawn-out process of applying for grants and the time lapse of performing the work would probably have been the course taken.

How we have arrived here is not happenstance. In December of 2020, the Trustees of the day resigned leaving the Improvement District without quorum and in receivership. There were no nominations received to fill the vacancies. One individual came forward to help maintain operational continuity while the future of LWD remained unresolved. To confirm that the LWD was absolutely in receivership, HMA mandated a new call for Trustees to step up to the plate and fill the vacant positions. Again, nobody came forth. This lack of interest signalled to HMA that a letter written to them dated February 26, 2018, stood in which it said all five trustees concluded that they had no choice but to seek conversion of the Lund Waterworks District from an Improvement District to a Regional District Service Area. This desire was once again confirmed in a subsequent letter to the ADM dated June 19, 2020. On February 22, 2022, Cabinet passed an Order-in-Council to formally appoint a Receiver.



1. Climate Change and Source Water Resilience

Why the public may hear references to both WHO “best practice” and BC funding requirements is as follows:

Two different frameworks are often discussed when planning drinking water infrastructure:

1. WHO (World Health Organization) best practice guidance, and
2. BC funding agreement requirements under the Investing in Canada Infrastructure Program (ICIP).

They serve different purposes and should not be confused.

WHO best practice guidance and what it is

The World Health Organization publishes international public health guidance for drinking water systems of all sizes. A core principle of WHO guidance is that:

Risk to drinking water safety is driven mainly by system scale, complexity, and resilience, not by whether a community is in a rich or poor country.

WHO therefore issues specific guidance for small and rural water systems, because such systems typically:

- rely on a single water source,
- have limited redundancy and storage,
- have smaller operating budgets and staffing, and
- are more vulnerable to climate related stresses such as drought, wildfire, extreme rainfall, and source water changes.

For these reasons, WHO best practice encourages proactive risk management, including:

- water safety planning,
- sanitary inspections,
- and, increasingly, climate resilient planning that looks ahead to future conditions rather than relying only on past averages.

WHO guidance is advisory. It informs good decision making but is not legally binding unless it is adopted into local regulation or contract.



BC funding agreement minimum compliance and what it is

The BC ICIP funding agreement sets out the minimum legal and contractual requirements needed to receive and retain grant funding.

Under this agreement:

- certain assessments (including climate resilience assessments) are required only if project costs exceed specific thresholds;
- for smaller projects, climate related studies may be eligible for funding, but are not mandatory unless the threshold is triggered.

Meeting funding agreement requirements confirms that a project is:

- contractually compliant,
- eligible for funding,
- and consistent with provincial and federal program rules.

It does not mean that all possible long-term risks have necessarily been examined, only that the minimum required conditions for funding have been satisfied.

Why both perspectives matter

It is possible, and common, for a project to be:

- fully compliant with BC funding rules, while
- not fully aligned with WHO best practice, particularly for small rural systems facing climate related uncertainty.

Deciding whether to go beyond minimum compliance is a policy and governance choice, not a funding requirement.

That decision often weighs:

- affordability,
- risk tolerance,
- long term operating costs,
- and public confidence.

The funding agreement defines what is required to receive infrastructure funding, while WHO guidance describes internationally recognized best practice for managing drinking water risk. Especially, for small rural systems where risk is driven by system size and resilience rather than location or wealth.



Based on all of the McElhanney and MSR reports to date:

1. No report includes a formal or explicit climate risk assessment of the Lund water system.
2. Specific future climate scenarios (drought, wildfire, extreme rainfall, turbidity change, reduced snowpack) are not formally analysed.
3. Climate change is not explicitly incorporated into source selection, treatment design, reservoir sizing, dam safety, or lifecycle costing.

What is present is conventional, historically based engineering analysis using observed water quality, historical demand records, and current regulatory design standards.

Core WHO premise

WHO guidance for small and rural water systems is built on the principle that risk is driven primarily by system scale, complexity, and resilience, not by jurisdictional wealth. Small systems are more vulnerable because they rely on:

- a single source,
- limited storage and redundancy,
- limited operational capacity,
- and are more exposed to climate driven shocks (drought, wildfire, extreme rainfall).

What a Proportionate Climate Risk Assessment Would Involve

(Small system appropriate. Not a major study)

This is not a large or academic exercise. WHO explicitly promotes scaled, practical assessments for small systems.

Scope

A proportionate assessment would typically include:

1. System hazard identification (workshop based):
 - Drought duration and frequency
 - Wildfire & post fire runoff
 - Extreme rainfall & turbidity spikes
 - Reduced snowpack/recharge
 - Compound events (fire → rain)



2. Simple scenario testing:

- “What happens if summer inflow drops X% for Y weeks?”
- “What if turbidity spikes exceed historical max?”
- “What if dam spillway faces higher inflow frequency?”

3. Vulnerability screening:

- Source
- Intake
- Treatment
- Storage
- Dam
- Operations

4. Risk ranking:

- Likelihood × consequence
- Focused on public health, service continuity, and cost exposure

5. Targeted mitigation options:

- Low cost, high value actions
- Operational changes
- Design contingencies
- Monitoring triggers

No detailed climate modelling is required for a small system.

Cost magnitude

For a system the size of Lund:

- Order of magnitude cost:

~\$25,000 – \$75,000, depending on depth and facilitator

This is small relative to total project costs and comparable to one minor engineering allowance already carried in contingencies.

What it would realistically change

Likely changes:



- Improved confidence in:
 - reservoir sizing robustness,
 - treatment resilience to water quality shocks,
 - dam safety exposure to future hydrology,
 - long term operating cost assumptions.
- Identification of low-cost resilience measures (e.g., monitoring, operating rules, redundancy triggers).

Unlikely to change:

- The fundamental need for a new treatment plant
- The need for reservoir replacement
- The basic choice of treatment technology
- The requirement for dam safety upgrades

In other words, it would refine and de risk decisions, not restart the project.

The existing studies were designed to meet current regulatory and funding requirements using historical conditions. They did not assess how future climate pressures, such as drought, wildfire, or extreme rainfall could affect water supply reliability, treatment performance, storage, dam safety, or long-term costs. A small, proportionate climate risk assessment could close this gap without materially redefining the project.

Having said that, in Canada, the governing public-health and drinking-water framework starts with Health Canada's Guidelines for Canadian Drinking Water Quality, which are developed with the Federal-Provincial-Territorial Committee on Drinking Water, and in BC with the *Drinking Water Protection Act*, the Drinking Water Protection Regulation, and the requirements imposed through the local drinking water officer and permit process. Health Canada's own summary tables emphasize that microbiological protection is the highest priority and that a source-to-tap approach is the basis for safe drinking water.

It should be noted as well that storage sizing against a 120-day no-rain condition and some resilience-oriented stress testing has been embedded in design assumptions.

And, equally important to climate change is BC's statutory framework. The *Drinking Water Protection Act* requires water suppliers to provide potable water, empowers drinking water officers, allows them to require source and system assessments where threats need to be identified, and requires emergency response and contingency planning for prescribed systems. The Drinking Water Protection Regulation further requires disinfection for surface water supplies and for any groundwater source that, in



the opinion of the drinking water officer, is at risk of containing pathogens. Construction permits and operating permits are part of that same regime. The engineering reports to date are based fully on these assumptions.

Regarding the dam assessment and climate resilience, extended drought conditions have been considered, as we are generally experiencing wetter winters now. Also, snow pack is not a contributing factor for storage and capacity as it is mostly rainfall in our geographic location. The Lund area is described as low coastal terrain ranging from sea level to hills of about 80 m above sea level, and uses Powell River climate normals showing average monthly air temperatures from about 4°C in December to 18°C in August, with precipitation far more prominent than cold-season snow storage in the immediate mapped area.

The existing engineering work appears to meet current regulatory and funding requirements. It does not appear to include a formal standalone climate risk assessment. A proportionate assessment could improve confidence around drought, wildfire, turbidity, storage, source resilience, dam safety, and long-term cost exposure, but it would likely refine the project rather than fundamentally change it.

2. Dam Repair Versus Dam Replacement Costs

Based strictly on the language of the ICIP Shared Cost Agreement, Thulin Lake dam repairs, upgrades, or replacement are not explicitly included in the approved scope of the Lund Water System Renewal Project, unless they are limited to minor works that can reasonably be characterized as “water reservoir repairs.”

Anything beyond minor, ancillary works to existing reservoirs or appurtenant structures would likely constitute a scope change requiring formal amendment and approval.

As such, the:

- new water treatment plant;
- new water storage reservoir;
- new intake and pumphouse;
- water reservoir repairs; and,
- associated piping and other works

are all one project.

The Thulin and Lund Lake Dams are a separate risk and remediation project. The qRD applied for and was awarded a Disaster Resilience and Innovation Funding (DRIF) program Stream 1 grant. The DRIF program provides funding for activities that support community resilience by providing data, building partnerships, and supporting long-term



disaster risk reduction and climate adaptation planning; and structural and non-structural disaster risk reduction projects. The Stream 1 grant enables us to perform foundational work, and we are actively engaged in that now.

Foundational projects include activities that support community resilience by providing data, building partnerships, and supporting long-term disaster risk reduction and climate adaptation planning, such as:

- Risk mapping
- Flood-plain mapping
- A disaster risk reduction/climate adaptation plan or a multi-hazard/climate risk resilience plan
- Assessment of the community's adaptive capacity
- Planning and design activities related to the development of proposed structural projects
- Benefit-cost analyses to assess the future of risk reduction options under consideration
- Flood mitigation planning, including both structural and non-structural solutions
- Other innovative projects that improve knowledge of risks and disaster risk reduction solutions

The qRD also submitted an application to the DRIF program Stream 2 grant for structural projects. We expect a decision to be announced in the fall.

Structural projects include:

- Construction or upgrading of infrastructure (e.g., dikes, dams, floodwalls, retention ponds, flood pump stations)
- Installation of structural flood protection works, or upgrades/retrofits to modernize existing structural flood protection works
- Slope stabilization projects new or modified public cooling/warming infrastructure (e.g., HVAC systems for designated cooling/warming centres, treed corridors for extreme heat. Operations and maintenance projects are ineligible, e.g., fire alarms, electrical upgrades outside of what is needed for the approved project)
- Movement or armouring of critical infrastructure
- Daylighting or opening buried waterways and restoring to more natural conditions
- Vertical evacuation refuge structures (limited to communities with potential tsunami inundation and where the population is unable to evacuate to high ground)
- Other structural solutions

In the case of structural (Stream 2) projects, eligible proponents must own, operate, and maintain the proposed infrastructure. Where the proponent is not the owner of the



infrastructure and associated assets, the project may be eligible if ownership of the infrastructure and associated assets are transferred to the proponent before the project is complete. For example, an eligible proponent may apply for infrastructure owned by an improvement or diking district, water utility, or private water systems at the time of EOI submission, if the ownership of the infrastructure and associated assets is transferred to the sponsoring local government as a part of the project. Evidence of future ownership transfer must be provided at the full proposal stage.

Based on the Shared Cost Agreement (SCA) IG0575 and the nature of the Lund Waterworks District Engineering Consultant Cost Review Report (MSR, 2023), the MSR report represents a separate, standalone exercise, not part of the Lund Water System Renewal Project as approved under the SCA.

The Lund Waterworks District Engineering Consultant Cost Review Report is a separate project or advisory study, distinct from the Lund Water System Renewal Project (IG0575) defined and funded under the Shared Cost Agreement.

It has no effect on the approved Project scope unless and until its recommendations are formally adopted through a Schedule A amendment approved by the Province and Canada.

Provincial dam safety regulators have identified Thulin Lake Dam as a high consequence structure with significant safety deficiencies that must be addressed.

These findings create a legal obligation on the dam owner to manage and reduce risk through monitoring, interim mitigation, and planning for remediation.

Separately, replacing or decommissioning dams requires secured funding, detailed design, regulatory approvals, and consultation. While professional engineers have recommended dam replacement as the long-term solution, that recommendation does not itself constitute funding approval or authorization to construct. Decisions about funding and project delivery are made through separate government programs and approvals.

The DRIF funded first phase, together with the 2023 engineering cost review, does not authorize construction or finalize dam replacement. It develops the preliminary technical and financial foundation needed to understand whether continued repair is viable or whether replacement is warranted. This work includes early screening of seismic and foundation risks, identification of downstream consequences to the Lund community, and order of magnitude cost estimates calibrated to those risks. Detailed investigations, final design, and confirmed costs would only occur in a later phase that would require separate funding approval and authorization.



Should the DRIF Stream 2 grant be successful, depending on the amount awarded, this would be a 100% eligible funded grant. Therefore, in theory, there would be little to no tax implications.

I will repeat, a recurring source of confusion, understandably, given how often the two are discussed together, is the relationship between the water system upgrade and the Thulin and Lund Lake Dams. These are legally and financially distinct undertakings:

- The water system upgrade (treatment, storage, pumping, and distribution) is funded through the Investing in Canada Infrastructure Program (ICIP) Shared Cost Agreement IG0575. This is the project for which Lund electors will be asked to approve local borrowing.
- The Thulin and Lund Lake Dams renewal and removal project is funded separately through the Disaster Resilience and Innovation Fund (DRIF). Stream 1 funding (\$243,500) has been awarded for preliminary design; the Stream 2 application for detailed design, through construction (estimated at \$4.7 million) is pending, with a decision anticipated this fall.

The dam work is not included in, and does not draw on, the ICIP grant or the local borrowing associated with the water system upgrade. Should the DRIF Stream 2 application succeed, it is expected to be a 100% funded grant, meaning little to no tax implication for Lund ratepayers from the dam work itself. The dams are nonetheless a real and separate obligation: both have been classified by the Province's Dam Safety Program as High Consequence structures with a 1-Alert risk rating, and that classification creates a standing legal obligation on the dam owner, currently the LWD, to manage and reduce risk regardless of how the water system conversion proceeds.

The borrowing request is for the water system upgrade. It is not for dam replacement. Dam-related obligations are real, but they are being pursued through a separate DRIF funding stream.

3. Current Project Scope Versus Full qRD Acquisition Ready Scope

The qRD is confident that the current scope will bring the condition of assets up to an acceptable standard to satisfy Policy 3.15 - Water/Wastewater Utility Acquisition.

As previously mentioned, the Thulin and Lund Lake Dams are a separate project. The qRD is currently working with an awarded DRIF Stream 1 grant performing foundational work and a Stream 2 grant application for construction has been submitted.

Prior to takeover the qRD expects all easement, rights-of-way and fire hydrant issues to be resolved by LWD and HMA.



Water treatment, storage facilities and pumping stations will be constructed to post-disaster building standards.

It is the qRD's intention to extend a line along Finn Bay Road to tie into the underwater main. This will achieve several positive outcomes. Three polyethylene storage tanks currently sit in the vicinity on the site of the former wood stave reservoir for this neighbourhood. They serve no purpose but for fire protection. Connecting these tanks into the greater system will reduce the need for additional water storage and utilize the water in the tanks for more than just fire flow. The submarine line will also be upsized to a minimum 150mm diameter.

It should be noted that Trihalomethanes (THMs) do not form instantly at a water treatment plant, they increase over time and distance. The highest concentrations are typically found:

- At the far ends of the distribution system (dead ends)
- In areas with long water age / residence time
- In storage reservoirs or tanks with low turnover
- In warm zones of the system (temperature accelerates reactions)

By creating this loop there will be redundancy in the system to assist in prevention of THM build up, better utilization of the treated water, reduction in water storage tank size, and opportunities for water system isolation and enabling all water users to receive uninterrupted water flows during maintenance and repairs.

4. Sensitivity Analysis for Cost Escalation

As mentioned earlier, regional district services are discrete. We do not have a service and thus no funding to carry out these exercises.

To utilize feasibility study funding would be an unfair imposition on the other electoral areas.

The project estimate includes a 25% contingency in case there are cost increases or bids come in higher than expected. If conversion is successful, the qRD will then start the process of tendering the project. The bids will give us a closer estimate of projected costs. If costs are projected to be greater than the budget, then staff will determine a course of action.

We do not see value in producing a half-dozen or more variations or scenarios of the parcel tax estimates as this would serve more to confuse residents than inform them of anything of value or significance.



The Upgrade Project Scope of Work and Cost Estimates, originally created by MSR and updated over the last several years (most recently by the qRD in early 2026), was provided publicly at the LWD Open House and is posted on the LWD website. This estimate accounts for potential cost increases by applying a contingency factor.

An industry-standard contingency of 25% has been applied given the information that is currently on hand for the construction of the project. This is based on Engineers and Geoscientists British Columbia (EGBC) Guidelines for Class C construction cost estimates. The contingency has been applied to the Subtotal Construction Costs as detailed in the cost estimate. Construction cost escalations have also been applied that have been verified by the LWD engineering consultant to update costs and value the construction for a 2027 start-date.

As this estimate is publicly available, anyone so inclined should be able to estimate a 10, 20 or 30% capital cost escalation as the capital cost figures were explicitly detailed in the publicly available cost estimate (Subtotal Construction Costs and Total Eligible Project Costs). This can then be divided over the currently estimated 124 parcels in LWD to yield the estimated flat parcel tax increases.

Realistic dam replacement costs are currently estimated at \$4.7M per the recent DRIF Stream 2 application. These costs are not included in the parcel tax estimates as this work is not part of the ICIP project scope.

The current estimate plus ineligible costs were detailed in the same cost estimate noted above that was provided at the LWD Open House. Most ineligible costs are fixed estimates from MSR. The only ineligible cost that is currently variable is the qRD Project Management Fee, which is 2.5% of the Total Eligible Project Costs. This has also been included in the posted documents on the LWD website, so is publicly available. The currently estimated ineligible costs have already been incorporated into the flat parcel tax estimate. Again, however, these costs can be estimated as a portion of flat parcel tax by taking their value and dividing them over the LWD parcels.

I believe that the MSR proposal for the LWD system upgrade has accounted for climate change as it relates to treatment, as VCH informally commented that the proposed dNF treatment facility can be modified to accept sources other than surface water, such as groundwater.

The source security upgrades will be addressed and accounted for in the detailed design for the Thulin and Lund Lake dams renewal and removal project (surface water source).

The value of climate related treatment would be included in the ICIP grant and thus would be accounted for in the current flat parcel tax. Source security upgrades are



included in the project scope submitted under the DRIF Stream 2 grant application which is for 100% of eligible costs, so it would have no impact on the flat parcel tax.

If the debt payment did need to increase the incremental debt payment on a further \$1 million dollars of borrowing is estimated at \$74,212 per year. This increased debt payment would mean an annual increase of approximately \$598 if recovered via a flat parcel tax or \$563 per average home if the debt was to be recovered via a property value tax.

5. Ineligible Costs

Ineligible costs include:

Municipal Finance Authority of BC borrowing fees	\$48,000
Legal surveys and legal fees	\$113,033
Land acquisition for statutory rights of way	\$283,101
qRD project management	\$258,000
Total	\$702,134

The costs are estimated. If the actual costs exceed the estimates the qRD would have to make a plan of action as to how we might deal with the proposed additional costs.

The ineligible costs for Legal Survey & Legal Fees and Land Acquisition for SRW have been estimated by MSR based on their understanding of the current situation of the LWD infrastructure. MFA borrowing costs would be relative to the amount of funds borrowed, so would be variable.

The qRD project management costs are a function of the total project capital costs, estimated at 2.5% of the Total Eligible Project Costs, so these are variable as well.

These costs could potentially be reduced, otherwise adjusted or offset, depending on the level of involvement of qRD staff on the overall management of the project.

Additional ineligible costs would have to be covered by local borrowing, as the LWD has little to no reserves that could be utilized to cover ineligible costs.

That said, provided that the LWD and HMA can resolve the Statutory Rights-of-Way and Easement concerns in advance of the project commencing, as is required by the qRD Utility Acquisition Policy 3.15, Article 6.9, the legal survey fees and required land acquisition for SRW's/Easements should be kept to a minimum, potentially less than currently estimated.

The Legal Survey, Legal Fees and Land Acquisition for SRW costs are a direct result of the historical challenges presented by the installation of water distribution infrastructure

14



without proper surveys accompanied by the associated legal charges, lien or notations (SRW/Easement agreements) with landowners on properties not owned by the LWD.

These challenges are common to Improvement Districts, as the distribution system infrastructure typically develops over time without specific designs and plans. As the qRD is held to a higher standard than the LWD, and per qRD Board direction received in 2025, all infrastructure must reside within legal SRW's and easements in order for the qRD to assume ownership of the Utility.

Allow me to expand. Members of the community have noted, correctly, that different cost figures have appeared in different documents over the life of this project. This is not an inconsistency to leave unexplained. The figures below are presented with their dates and sources so one can see how the estimate evolved as the engineering scope was refined:

Source / Date	Estimate	Basis
McElhanney, Oct 2022	~\$26.6M	Full Class C municipal-standard design, 30% contingency — the original engineering baseline
MSR Solutions, May 2023	~\$11.9M	"Needs vs. wants" review reducing scope to a smaller treatment footprint, reduced storage and submarine line costs
qRD, April 2026	\$14.6M–\$15.0M	Updated for 2026 construction pricing, post-disaster storage standards, and the Finn Bay Road loop

The figure that matters for most purposes, and for every Lund property owner, is the local borrowing amount. Based on the current scope and maximum ICIP grant utilization, the project's total estimated eligible and ineligible costs are as follows:

Item	Amount
Total estimated project cost (maximum ICIP scenario)	\$15,024,380
ICIP grant (73.33% of eligible costs)	\$11,017,378
Local portion of eligible costs	\$4,007,002
Ineligible costs (legal surveys, land acquisition for rights-of-way, qRD project management, MFA borrowing fees)	\$702,134
Total local borrowing requested	\$4,709,136



Every figure in these tables is an engineering estimate carrying an industry-standard contingency, and remains subject to final detailed design and to construction permit approval by Vancouver Coastal Health. Actual tendered costs may come in above or below these estimates; that is the purpose of the construction contingency built into the current numbers, and it is also why the qRD has been clear that final costs will only be known once the project is tendered following any conversion approval.

On the ineligible costs specifically: these are not new or hidden charges. They are costs the ICIP grant does not cover by design, chiefly legal survey and land acquisition costs tied to securing proper statutory rights-of-way for infrastructure that, in several cases, was installed decades ago potentially outside of easements. The qRD's Utility Acquisition Policy 3.15, Article 6.9 requires that all infrastructure reside within legal rights-of-way before the qRD can take ownership. If the LWD and the Ministry of Housing and Municipal Affairs (HMA) are able to resolve these matters in advance of construction, these costs, and the associated local borrowing, could be reduced below current estimates.

6. Full Annual Household Cost

The full annual costs are estimated as follows:

Debt payment will be collected either via a Parcel Tax Or via a Property Value Tax, not both.

If debt payment is recovered via a flat parcel tax an average representative household should expect to pay:

Debt payment if via flat parcel tax	\$2,818
User fees	\$1,200
Annual replacement reserve contribution	\$1,150
Total Annual Cost	\$5,168

OR

If debt payment is recovered via a property value tax an average representative household should expect to pay:

Debt payment if via property value tax	\$2,652
User fees	\$1,200
Annual replacement reserve contribution	\$1,150
Total Annual Cost	\$5,002



The annual user fees will be used to pay for the following:

- System operation
- Testing and compliance
- Treatment chemicals or consumables
- Electricity
- Insurance
- Administration
- Emergency repairs

The annual replacement reserve contribution will be used to pay for the following:

- Asset renewal
- Future capital replacement

The user fees noted above are for an **average** household. Water use will be metered so a household that uses a lot of water will pay more than a household that uses very little water, but on **average** we project user fees to be approximately \$1,200 per year.

Successful businesses have been managing their assets for decades.

Although local governments have always owned infrastructure and assets, they historically did not manage them strategically but relied on taxation or debt financing to renew and replace them. Traditionally a local government would build infrastructure when it was needed, fix it when it breaks and fund it through taxation or borrowing. This practice led to deferred maintenance, hidden infrastructure deficits and rising long-term costs. When a local government inherited or purchased an asset it was not shown on the books at its historical value and expensed as it was used up, it was just expensed in the year of purchase like any other operational cost. The cost of owning the asset over time was not recognized in the financial statements.

In the case of the qRD, we have been proactively planning (financially) for our assets for many, many years. For example: When the City of Powell River operated the incinerator and landfill site the qRD purposely set some of the funds aside into a reserve as we knew that one day we would need to develop an alternative landfill site. For Lasqueti we purposely set funds aside annually for possible free-store expansion and development of future landfill or a transfer station. As another example: We had been setting funds aside for the Cemetery for new burial sections and future site development.

While we had been doing some proactive financial planning for our assets, we were not managing them. We did not have an inventory of what we owned, or inherited. We did not record the annual cost of using up that asset over time. When we made a purchase most often the consideration was to purchase whichever choice was least expensive. A



business, on the other hand, would not always purchase what was cheapest as they are looking at their assets as investments to provide a return over the asset's life cycle. A business wants to know what the asset costs them each year that it is in productive use, how to keep it operational, and how to make it last as long as possible. Because of the difference in mindset a business might not purchase the cheapest option, they would look at the option that would provide them with the lowest cost over the asset's life cycle and the best return for their money.

The province recognized that readers of the local government financial statements could not see what the assets were costing over time as they were used up and mandated that local governments formalize plans to manage their assets. The PSAB Section 3150 - Tangible Capital Assets standard required that local governments recognize and report their tangible capital assets on their financial statements for fiscal years beginning on or after January 1, 2009. Starting in 2009 local governments had to:

- Complete and inventory of their assets
- Estimate historical costs
- Begin depreciating their assets

One way to explain the concept might be:

Asset management is about looking after the things that you own so that they keep working well, don't cost too much over time, and last as long as possible. For the water system:

- We need to know what we have (distribution system (pipes in the ground), reservoirs, pump stations, treatment plant, etc.)
- We need to take care of the system (service the pumps, service the treatment plant, etc.)
- We need to fix things at the right time (not too early as it is a waste of money, but not too late to risk failure)
- We need to plan ahead (save money to replace pipes, the treatment plant or the reservoir in the future)

Asset Management BC is providing free online training opportunities for community infrastructure and asset management in BC. It is a two-hour, self-paced online course designed to help staff, senior management and elected officials in BC understand the importance of asset management.

We are provincially mandated to plan ahead for the renewal costs of our capital assets. Proactively setting funds aside annually helps to ensure we can afford to repair, replace and maintain our assets over time. Best practice and responsible local government means not only planning for these costs, but actively managing the assets every day.



7. Comparison With Groundwater and Dam Removal

Groundwater vs. surface water as a raw water source

Evidence based comparison for potable water treatment systems.

Well characterized groundwater is, in general, a more reliable and dependable raw water source for potable water treatment systems than surface water, particularly for long term availability, predictability, and operational stability.

Surface water remains advantageous where groundwater storage is geologically constrained or where large, centralized supplies are required.

This conclusion reflects global scientific consensus, not a universal rule.

Why groundwater is often more reliable

a) Storage and buffering:

- Groundwater resides in geologic storage, often integrating years to decades of recharge.
- This makes groundwater less sensitive to short term climate variability (storms, droughts, snowpack timing).

USGS and UNESCO both identify groundwater as the primary natural buffer against hydrologic extremes.

b) Predictability and forecasting:

- Aquifer water levels typically change slowly and measurably, enabling trend-based forecasting once monitoring exists.
- Peer reviewed syntheses show groundwater trends are more stable and forecastable than river flows under non stationary climate conditions.

c) Raw water quality stability:

- Groundwater is naturally filtered through soil and rock, resulting in lower microbial variability than surface water.
- This reduces treatment complexity and operational risk, though chemical issues must be managed.



Where surface water still has advantages

Surface water performs better when:

- Large instantaneous volumes are required
- Geology limits groundwater storage
- Economies of scale justify centralized treatment
- Recharge occurs primarily as runoff rather than infiltration

However, surface water is:

- More exposed to wildfire, landslides, turbidity spikes, algal blooms
- More variable under changing precipitation timing

USGS explicitly documents higher volatility in surface water systems.

From a reliability perspective, groundwater is generally superior where aquifers provide storage.

From a scale and logistics perspective, surface water may be preferable where groundwater storage is poor or fragmented.

Geology and topography that best support sustainable groundwater

Key finding from USGS, UNESCO, and peer reviewed hydrogeology:

Groundwater sustainability depends primarily on geology (storage and permeability), with topography influencing recharge efficiency rather than storage itself.

Geological / topographic settings with strongest evidence for sustainability

1. Alluvial and buried valley aquifers (highest confidence)

Attributes:

- Flat to gently sloping valleys
- Thick sand and gravel deposits
- High porosity and permeability
- Large storage volume



Evidence:

- Identified by USGS as principal aquifers supplying potable water at regional scale.
- Peer reviewed work confirms these systems provide predictable, drought resilient supply.

2. Glacial outwash plains and buried paleovalleys

Attributes:

- Thick glacial sediments
- High recharge and storage capacity
- Common in Canada and northern regions

Evidence:

- Explicitly included by USGS within unconsolidated aquifer systems.
- UNESCO identifies them as climate resilient due to long term recharge integration.

3. Karst (carbonate) plateaus – conditional:

- Very high yields possible
- High vulnerability to contamination
- Requires strong protection and governance

4. Crystalline bedrock and steep mountainous terrain

Attributes:

- Low porosity
- Minimal storage
- Water occurs only in fractures

Evidence:

- USGS classifies crystalline rock aquifers as low storage and highly variable.
- Peer reviewed literature confirms reliability is limited and site specific.



Evidence aligned hierarchy (most → least favourable):

1. Alluvial / buried valley aquifers
2. Glacial outwash systems
3. Karst systems (managed)
4. Fractured crystalline bedrock

Application to qathet / Powell River geology

Regional geological context:

- Dominated by Coast Mountains granitic and metamorphic bedrock
- Steep, semi mountainous terrain
- Thin soils, high runoff
- Limited areal extent of large sedimentary basins

Groundwater implications for qathet / Powell River

What the geology supports well:

Recharge:

- High precipitation and snowmelt
- Bedrock uplands act as effective recharge zones

What the geology does not support well:

Large, regional groundwater storage:

- Granitic bedrock provides very limited aquifer storage
- Well yields are fracture controlled and highly variable

Where groundwater can be viable locally

- Valley bottoms and floodplains
- Localized sand and gravel deposits
- Shallow weathered bedrock zones
- i.e. Fraser Valley and lower mainland valleys

BC groundwater mapping shows productive aquifers occur where unconsolidated sediments are present, not on granitic uplands.



Surface water vs groundwater for qathet / Powell River

Evidence based assessment

In qathet / Powell River, surface water is often the more defensible primary local government raw water source, because:

- Geological storage for groundwater is limited
- Groundwater systems are small and seasonal
- Large, centralized groundwater supply would be high risk

However:

- Supplementary or localized groundwater may be appropriate where sedimentary aquifers exist
- Groundwater can increase resilience if redundancy and proper monitoring are in place

This aligns with both BC provincial groundwater science and global hydrogeologic consensus.

In the context of Lund, preliminary work has identified a constrained fractured-bedrock setting, little to no saturated overburden storage, likely dependence on fractures that may be hydraulically connected to nearby lakes, uncertain sustainable yields, saline risk in some wells, and likely need for at least five wells.

Final analysis

1. Globally, groundwater is usually the more reliable raw water source for potable systems because it provides geologic storage, buffering, and predictability.
2. Sustainable groundwater requires specific geology: thick sediments or buried valleys, not steep bedrock terrain.
3. qathet / Powell River sits in a geology that favors recharge but limits storage, making large scale groundwater dependence risky.
4. Surface water is therefore a reasonable primary source in qathet, with groundwater best used selectively and strategically, not as a wholesale replacement.

This position is fully aligned with USGS, UNESCO, peer reviewed hydrogeology, and BC government science and is defensible in both technical and public policy settings.



The qRD has recently engaged MSR Solutions and their sub-consultant Elanco to perform a 72-hour pump test and well assessment of the artesian well (WPN 62469) at the Northside Volunteer Fire Department (NVFD) Hall #2, located at 9574 Roots Way in Lund. Can-West drilling, who drilled the well, will be assisting Elanco in the 72-hour pump test. The 72-hour pump test will help to determine the potential flowrate and output of the well, and a full laboratory water-quality analysis of the groundwater will be conducted.

In addition to the testing of the well at NVFD Hall #2, MSR Solutions will be conducting an analysis of the potential costs for a groundwater supply as an alternate source for the LWD. At present, long-term sustainability of existing well yields is unknown because formal pumping tests have not been completed. The best future well sites will likely need hydraulic connection to surface water bodies and access to critical sites may be difficult. Wells are unlikely to have sustainable yields above 150 m³/day; and a 600 m³/day well field would likely require at least five wells. So, a cautious approach would be to proceed under the assumption that at least five groundwater wells would be required to provide the flows necessary to meet the required Maximum Daily Demand plus Fire-Flows (MDD+FF) or the Peak Hour Demand (PHD) for the LWD system.

The analysis will include some high-level cost estimates for construction of access roads, clearing of well sites, well drilling, well installation, testing, power infrastructure from the BC Hydro grid to the well-sites, electrical, SCADA and backup power costs and construction costs for the distribution infrastructure (water distribution mains) required to deliver water from the wells to a single common treatment facility.

With respect to costs, it is important to note that treatment costs including auxiliary power, disposal and other items are around \$2.2 million of a \$9.6 million project before contingencies, which is about 23% of project costs.

The consideration of a ground water supply alternative has many hurdles to be proven. Costs are being reviewed and it is important that the costs of decommissioning of dams will be required, likely not creating a cost-effective alternative. In looking at the water analysis for Thulin Lake and the Fire Department well, it is noted the ground water is hard, and has sodium at 73 mg/L compared to the surface water supply at 3 mg/L creating an impact to human reasonable salt intake.

The regulatory hurdles are also real and should be stated plainly. Under the *Water Sustainability Act*, non-domestic groundwater use is licensed in BC, well construction and decommissioning are regulated activities, groundwater sampling and analysis are required for new or altered wells, and the regime includes aquifer-protection provisions. For drinking water specifically, groundwater that is considered at risk of pathogens can



still require disinfection under the Drinking Water Protection Regulation. It is anticipated that water treatment and disinfection is required for both surface water and groundwater, at similar costs.

Health Canada also says sodium is relevant for sodium-restricted diets, identifies 20 mg/L as a level of interest in that context, and uses 1.5 L/day as a planning intake assumption. On that basis, 73–81 mg/L would contribute roughly 110–122 mg/day of sodium from drinking water alone. Groundwater has meaningfully higher sodium exposure and salinity variability compared to the Thulin Lake source.

The decommissioning-cost point is also important and any groundwater-versus-surface-water comparison that does not include dam-removal or dam-remediation obligations is not telling the full story.

Let me reiterate, several residents, have asked why groundwater has not been pursued more aggressively, particularly given the artesian well at the Northside Volunteer Fire Department site. This is a legitimate question.

The qRD has engaged MSR Solutions and their hydrogeological sub-consultant, Elanco Enterprises Ltd., along with a drilling company, to conduct a 72-hour pump test and full water-quality analysis of the NVFD well, along with a broader assessment of groundwater potential in the Lund area. This work is underway now. Preliminary desktop hydrogeological assessment indicates several relevant constraints that any final recommendation will need to weigh:

- Local bedrock is fractured granite with limited storage capacity; sustainable well yields in the area are estimated to be well below the 600 m³/day required to meet Maximum Daily Demand plus fire flows, meaning a viable groundwater supply would likely require a minimum of three to five wells rather than one.
- Several existing wells in the area show elevated salinity, below aesthetic levels. However, they remain a concern for residents with health issues. The surface water source does not have a salinity issue.
- Groundwater drawn from fractured bedrock of this kind is likely to be classified by VCH as Groundwater at Risk of Containing Pathogens (GARP), which would still require filtration, UV disinfection, and chlorination, meaning a groundwater source would not eliminate the need for a treatment plant, only change its design.
- A groundwater-based supply would still require new storage, distribution infrastructure, well power servicing, and because Thulin Lake would no longer be the primary source, the dam safety obligations would shift toward decommissioning rather than renewal, which carries its own environmental review and cost implications.



Groundwater is being assessed seriously and in good faith, not dismissed. But based on the evidence gathered to date, it is unlikely to prove materially cheaper once the full system cost is accounted for, including regulatory approval timelines for groundwater licensing. The results of this testing program will be made public once complete, and I have asked staff to ensure that happens promptly.

Based on the information currently available, groundwater does not yet appear to offer a clearly lower-cost or lower-risk alternative, but the qRD is completing further testing before drawing a final conclusion.

A final remark. Residents have asked why a particular treatment approach was selected and whether the engineering has kept pace with current guidelines. This sits at the heart of why the proposed system costs what it does.

The qRD's engineer of record, MSR Solutions Inc., evaluated four treatment technologies against the realities of Lund's water source and demand profile: enhanced slow sand filtration, dissolved air flotation with rapid sand filtration, ballasted flocculation with rapid sand filtration, and direct nanofiltration. Slow sand filtration, initially favoured for its lower operating cost, was found not to be viable once the elevated Total Organic Carbon (TOC) content of the Thulin Lake source was accounted for; it would require either a much larger treatment footprint than the site can accommodate, or a higher-cost design with materially higher operating costs.

Direct nanofiltration was selected because it offers the smallest footprint, the lowest long-term operational burden on a small system with limited operator capacity, and a design that can be configured with multiple treatment trains. This is important for a community system facing both winter high-flow, high-turbidity conditions and summer tourism-driven peak demand. This redundancy is what allows the plant to remain in service through both seasonal extremes and changing source-water chemistry, rather than being taken offline for maintenance or overwhelmed during a single failure event.

This is also a direct response to the lessons of Walkerton and North Battleford, which fundamentally reshaped drinking water regulation in Canada. A small system serving year-round residents and a significant seasonal population cannot rely on a single point of failure. The proposed system is engineered for reliability, robustness, and resilience, and for the lowest construction cost on the needs assessment.

On the question of equivalency with provincial guidance: MSR Solutions has reviewed the proposed design against the 2024 Design Guidelines for Drinking Water Systems in British Columbia and has confirmed in writing that the design is fully within those guidelines. I would also direct readers to the June 2, 2026, letter from Jack Davidson, Drinking Water Officer with Vancouver Coastal Health, which clarifies an important point: the Design Guidelines are guidance, not regulation, and VCH's formal regulatory review will occur at the construction permit stage. This project has not yet reached this



stage because conversion and elector approval are the necessary preconditions. VCH has indicated that, in its preliminary view, nothing in the 2024 Guidelines is expected to fundamentally alter the project's public health requirements or materially reduce the scope of the infrastructure already identified as necessary.

8. Conclusion

The qRD recognizes that the pace of this process can feel slow, particularly set against how quickly information and opinion now circulate in the community. That pace is deliberate, not indifferent. The qRD is required to balance the interests of Lund residents, local businesses dependent on summer tourism, and the Tla'amin Nation. The Nation is both a landowner and rights-holder within the service area and is a party to an evolving government-to-government relationship with the qRD.

The path forward rests with Lund's water users. If a petition representing at least 50% of parcel owners, representing at least 50% of assessed value of all land and improvements in the service area, supports conversion to a qRD local service area, the qRD will proceed with borrowing approval, detailed design, and construction. If the petition does not succeed, responsibility for the system remains with the LWD membership. However, the considerable infrastructure and dam safety obligations described above will not disappear, only the grant funding currently available to address them will.

The future of the LWD, including its water system and governance, will ultimately be determined by the membership through the upcoming petition. HMA has indicated that its actions will reflect the direction provided by the membership. If the petition supports conversion, HMA would proceed with the required administrative steps, including the preparation of documentation and Ministerial Orders. If the petition does not support conversion, those efforts would not move forward.

In that case, responsibility for the water system, the Improvement District, and its future direction would remain with the LWD membership. This includes considerations related to infrastructure such as the Thulin and Lund Lake dams. As with any complex system, there are a number of uncertainties. It is not possible to predict how the Improvement District may evolve, nor how external agencies, such as Vancouver Coastal Health (Public Health) or Dam Safety, may respond to future conditions or regulatory requirements.

A comparable situation recently occurred within the RDOS, where Sage Mesa water users voted not to proceed with a proposed change, and the regional district subsequently discontinued its involvement. However, it should be noted that they did not have any grants in hand. <https://pentictonwesternnews.com/2026/05/08/district-formally-abandons-takeover-of-embattled-sage-mesa-water-system/>



Looking more broadly, LWD has a long history and has served its community for many decades. Like many systems of its kind, it has navigated changing expectations, regulatory environments, and financial realities over time. There are ongoing considerations common to water systems today, such as long-term financial planning, infrastructure renewal, regulatory compliance, asset management practices, and evolving water quality and treatment standards. These are complex matters that require careful planning, resources, and often external funding support.

At present, initiating new, large-scale studies or projects is challenging without identified funding sources. Regional districts operate within clearly defined service and funding frameworks, and significant initiatives typically require advance planning and the securing of grant funding. In this context, available funding opportunities, such as the ICIP program, are time sensitive.

The broader provincial policy framework regarding Improvement Districts has been in place for many years and continues to shape available options. Local governments, including the qRD, have recently raised advocacy points through forums such as the AVICC Convention, highlighting opportunities to modernize policies to better support sustainability, infrastructure investment, and orderly transitions. These discussions recognize both the challenges faced by Improvement Districts and the importance of ensuring viable paths forward, whether through continued independent operation or conversion.

At the same time, provincial expectations around oversight and support for Improvement Districts are significant, and it is recognized that meeting these expectations across a large number of districts may present practical challenges.

Ultimately, the decision rests with the membership. Each water user is encouraged to consider the information available, reflect on their priorities and level of comfort with potential outcomes, and cast their vote accordingly. Whether the preference is for continuity, change, or further certainty, all perspectives are valid and important. Whatever the outcome, the intent is to respect the decision of the membership and to support the next steps in a constructive and collaborative manner.

I want to close by acknowledging what is, at root, a difficult position for everyone involved. The costs presented are real and significant, and I do not minimize the burden they represent for many households. At the same time, the underlying infrastructure, built decades ago, has reached a point where deferral carries its own serious costs and risks. The qRD's objective throughout has been to bring forward a system that is high-quality, reliable, and sized to serve Lund's needs both now and as the community grows, while using every available grant dollar to minimize what falls to local taxpayers.

Lastly, there is a lot of pressure and stress put on local governments potentially taking over utilities. Residents are entitled to ask difficult questions and to weigh risks



differently. The qRD, however, must make recommendations and decisions that can withstand review by Vancouver Coastal Health and the applicable provincial and federal regulatory frameworks.

Thank you,

Al Radke, BSBA, CLGM
Chief Administrative Officer