WATER STREET ENGINEERING

TECHNICAL MEMORANDUM

Subject	Josephine Lake Capacity Analysis		
Project	Cowan Point Utility Company Ltd. Josephine Lake Water Supply		
To	Larry Adams Cowan Point Utility Company Ltd.	**From**	Laura Christensen, PEng and Allan Bronsro, PE, PEng
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1. INTRODUCTION

1.1. PURPOSE

This technical memorandum assesses the water supply capacity of Josephine Lake, located on Bowen Island, BC.

1.2. BACKGROUND

Bowen Island Properties is preparing a rezoning application for a pilot project at Seymour Landing at Cowan Point. Current plans involve the inclusion of multi-family homes (townhomes, fourplexes) and commercial buildings (stores, cafes, medical offices).

It is proposed that this future development would receive potable water supply from the Cowan Point Utility Company, which sources water from Josephine Lake to the northwest. The utility currently has 111 single-family equivalents connected to its system, and is authorized to serve an additional 31 homes (total 143 lots / single-family residential equivalents).

1.3. PREVIOUS WORK

Kerr Wood Leidal Associates Ltd. (KWL) has previously completed several assessments of water supply for Cowan Point's developments serviced by Josephine Lake, most recently updated in 2010 (Kerr Wood Leidal, 2010). In this update, a hydrologic analysis was completed, finding an estimated support capacity for the lake of 885 people (or 340 lots, at 2.6 people per lot) with a proposed long-term sustainable maximum withdrawal of 126,000 m^3 per year.

The 2010 KWL report noted "it is recognized that the demands used in this analysis may be conservative and future reservoir monitoring may show that additional development could be serviced by the water supply."

1.4. SCOPE

A capacity study for Josephine Lake is needed to support the rezoning application. The current scope of work is to review observed water demands and monitored lake levels of Josephine Lake. The objectives will be to confirm assumptions made in the 2010 report and determine whether the proposed additional developments are feasible to be serviced.

The scope of work for this assignment included:

1. Existing demand assessment: Developing existing/observed per-capita water demands from meter data, water treatment plant flows, and census populations. The existing per-capita demands are compared to previously projected demands (as per the 2010 report).

2. Future demand projection: Develop projected per-capita demands for future developments. Based on recent, local experience, demands for multi-family developments are generally lower than single-family (fewer people per dwelling unit, lower per-capita use). Refining the future demand projection will avoid overestimating their impact on the water system. Consideration of the Utility's current water conservation measures is included.

3. Capacity assessment: Review lake level data, rainfall, and water treatment plant flows. This will be compared against the assumptions made in the 2010 report and the 126,00 m^3/year (345 m^3/day) long-term sustainable maximum withdrawal.

1.5. LIMITATIONS

This technical memorandum is based on the existing analysis completed by KWL (Kerr Wood Leidal, 2010). It must be read with the Statement of Limitations at the end of this document.

2. DATA REVIEW

2.1. POPULATION

The number of single-family homes serviced is taken from Cowan Point Utility water meter readings, which lists all properties connected to the water distribution system. Note some properties are included in the list but are noted to not yet be connected or have no water consumption recorded; these properties are considered as not serviced. Based on the 2024 meter data the following properties are counted:

- 121 total properties
- 109 water connections (i.e., 12 properties have been subdivided but not yet connected, or have not had meter reads yet)
- 2 non-residential connections (golf course & WWTP)
- 101 occupied residential properties (some water use recorded over the year)
- 91 residential have year-round water use (regularly occupied dwellings)
- 10 properties have seasonal water use only (seasonally occupied dwellings)

Note that these property counts are based on observed meter data. According to the utility there are 112 connections. The difference may be due to properties under construction or currently vacant.

From the StatsCan 2021 Census of Population (Statistics Canada, 2023), the population per "usually occupied" private dwelling is 2.58 ca/du. Note that properties connected to the utility are within two dissemination areas, and so the population density is taken as the weighted average of these two areas (2.63 ca/du in dissemination area 59153665, and 2.47 ca/du in dissemination area 59153667).

Table 1: Serviced populations

Year	No. of single-family homes serviced	Population density assumed (ca/du)	Population serviced (ca)
2010 (KWL Study)	55	1.98	109
2022-2024	101	2.58	258

2.2. METERED CONSUMPTION RECORDS

All properties connected to the Cowan Point Utility are metered, and meters are recorded quarterly. A summary of the total metered consumption is provided in Table 2 and Figure 1.

Note that the metered data provided includes some negative readings (<1% of total water use), as well as some high readings (due to known leaks), which have not been corrected or removed. The 2024 Q2-Q4 consumption includes the golf course and WWTP (no ICI meter readings prior to this).

Table 2: Metered consumption summary (m³/day)

Year	Metered Consumption (m³/day) by Quarter				Average
	Q1 (Dec 16 - Mar 15)	Q2 (Mar 16 - Jun 15)	Q3 (Jun 16 - Sep 15)	Q4 (Sep 16 - Dec 15)	
2022	48.4	40.0	77.1	51.4	54.2
2023	32.2	53.0	64.5	39.9	47.4
2024	39.5	42.7	68.6*	41.5*	48.1
*includes the golf course (avg 1,350 L/day) and WWTP (avg 16 L/day)					

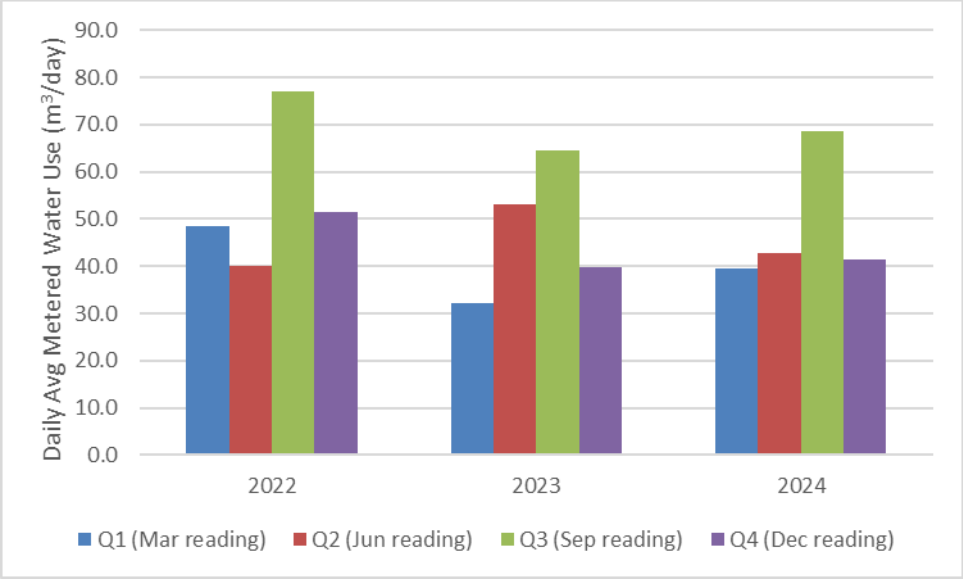

Figure 1: Metered consumption by quarter and year

2.3. WTP FLOWS

The raw water flows and filtered water flows at the water treatment plant (WTP) are recorded every 2 days but were provided on a quarterly basis for analysis (Table 3). For comparison, the Josephine Lake maximum withdrawal of 126,000 m³/year is equivalent to 345 m³/day versus the 2024 average daily raw water flow of 145 m³/day (i.e. 42% of maximum).

The filtered water flows tend to be smaller than raw water flows, as there is an overflow at the water treatment plant, which is utilized when flushing of the slow sand filters occurs or when there is more water being pumped than the filters' capacity. It is noted that there was an increased overflow in 2024 due to repairs to the WTP pumps, but the overflows are expected to decrease once the repairs are complete.

We note that filtered WTP flows are much larger than metered consumption flows (2023 average metered flow is 47.4 m³/day while the 2023 average WTP filtered flow is 136 m³/day; difference of 88 m³/day). This is further discussed in section 3.4.

Table 3: WTP flow summary (m³/day)

Year	Quarter				Average
	Q1 (Dec 16 – Mar 15)	Q2 (Mar 16 – Jun 15)	Q3 (Jun 16 – Sep 15)	Q4 (Sep 16 – Dec 15)	
Raw Water Flow (m³/day)					
2022	96.3	94.0	138.0	119.9	112.0
2023	118.4	136.0	157.1	148.0	139.9
2024	160.0	154.3	180.1	87.2	145.4
Filtered Water Flow (m³/day)					
2022	89.8	93.2	132.4	119.9	108.8
2023	119.4	132.4	149.2	141.3	135.6
2024	147.4	150.4	173.5	87.2	139.6
WTP Overflows (Raw Water Flow – Filtered Water Flow) (m³/day)					
2022	6.6	0.8	5.6	0.0	3.2
2023	-1.0	3.7	7.9	6.7	4.3
2024	12.7	3.9	6.6	0.0	5.8

2.4. LAKE LEVELS & RAINFALL DATA

Lake levels from 2009 (after the dam had been raised) until 2024 were provided and are shown in Figure 2. In all years, the spillway elevation was reached, i.e. the reservoir fully filled. The minimum lake elevation occurred in 2015, at 243.44 m. The depth-storage curve for Josephine lake was not provided.

Rainfall data at Josephine Lake was also reviewed. It is noted that periods of rain gauge failure were noted and snow depth is not included in the annual precipitation depth. Due to these data issues, the rainfall data is difficult to analyze from a statistical perspective.

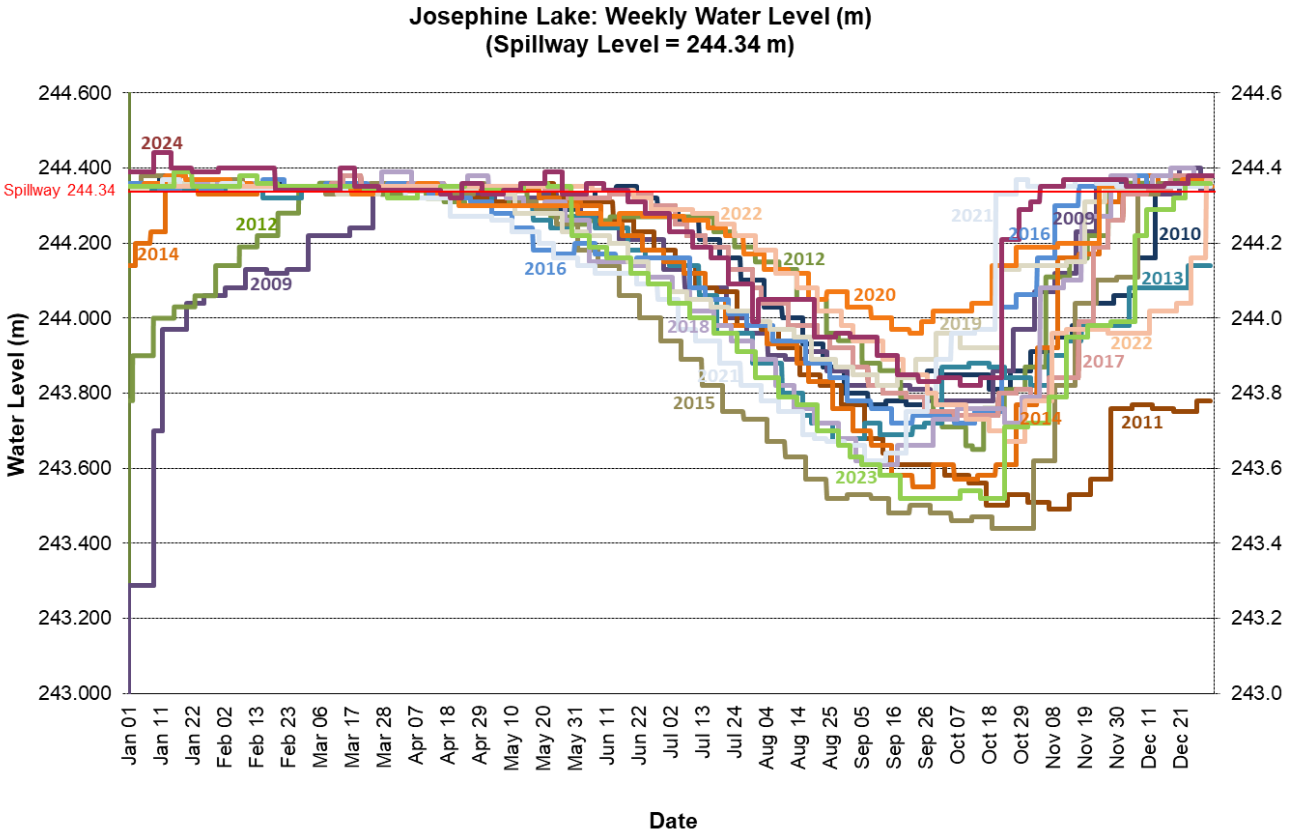

Figure 2: Josephine Lake Weekly Water Level (2009-2024)

Table 4: Josephine Lake Rainfall with Data Comments

Year	Total Annual Rainfall (mm)	Comment
1997	1,955.2	
1998	2,123.0	
1999	1,984.2	Gap Nov 30/99 to Jan 13/00
2000	1,276.0	
2001	1,552.0	
2002	1,176.8	
2003	1,454.6	
2004	1,576.0	
2005	1,510.8	Gap Dec. 24 to Dec. 31
2006	621.8	Gap Jan 1 to Mar. 10; gap Apr. 3 to June 20; gap Nov. 15 to Dec. 31
2007	1,268.4	Gaps Jan. 1 - 19, Feb. 2 - Mar. 9; and Nov. 22 to Dec. 10
2008	1,079.4	Gap Dec. 16-31 - lots of snow, freezing weather
2009	1,391.4	Gap Jan 1-5 - lots of snow, freezing weather
2010	1,562.2	Gap Jan 1-5 - lots of snow, freezing weather; no rain in July

Year	Total Annual Rainfall (mm)	Comment
2011	1,426.8	
2012	1,807.8	Gap Jan 15-20, Feb 28-29, Dec 18-19 - some snow, freezing weather
2013	1,298.2	Jan7-23 frozen, little precip; Jul no rain; Sep 12-16 battery recharge offline, total rainfall recorded those days
2014	1,692.6	
2015	1,824.8	Mar 23-24 battery recharge offline, total rainfall those days was recorded
2016	2,287.0	Dec 6-9, 12-19, 29-31 snow, freezing with snow, no precipitation recorded
2017	1,476.8	Jan 1-15 freeze/little snow; Feb-Mar very rainy/rain gauge damaged; Apr 4 gauge repaired; Jul 8-14 low battery
2018	2,269.2	Nov 12-15 gap battery failed so data not logged, significant rain one of the days not reported
2019	1,343.4	Feb 3-Mar 11 freeze-some days above 0/total 20-30cm snowfall
2020	1,127.4	Freeze/snow: Jan 14-16 (20-30cm), Feb 3-5 (10-15cm); Gauge problem rain Feb 26-27, Mar 11-12; Gauge stop Aug 20-Oct 30 (rain Sep 18-20, 23-26, Oct 9-13, 23) see dam log
2021	1,083.2	Freeze/snow: Feb 13-15 (5-10cm); battery stop Mar 29-Apr 3 (rain); battery dead Nov 16-24 (significant rain); freeze/snow Dec 23-31 (30-40cm)
2022	842.6	Freeze/snow: Jan 1-9 (10-20cm)
2023	944.8	Significant snow Feb 26-28 (approx 40 cm)
2024	1,313.2	Freeze/snow: Jan 12-17 (15-20 cm)

3. EXISTING DEMAND ASSESSMENT

Cowan Point Utility water meter readings were utilized to assess connected populations and calculate existing water demands. All properties connected to the utility are metered.

3.1. RESIDENTIAL UNIT DEMANDS

From the metered consumption data, residential unit demand rates were derived. All residential properties currently connected to the utility are single-family detached.

Residential demands were calculated on a lot-basis and then averaged. These demand calculations exclude properties with negative or zero quarterly water demands.

The demands were assigned as follows:

- Average day demand (ADD): Average Q1–Q4 demand
- Base demand (BD): Q1 demand, except for 2022 which uses Q2 demand
- Peak quarter demand (Q3): Summer (Q3) demand
- Seasonal demand (SD_{Q3}): Difference between peak quarter (Q3) demand and BD, represents the increase in demand in summer months

For properties included in the demand calculations, the unit rate demands were calculated (using the population density determined in Section 2.1). The resulting unit demand rates (ADD, BD, SD_{Q3}) are provided in Table 5.

Table 5: Residential unit demand rates

Year	Water Demand per Residential Lot (L/lot/day)			Water Demand per Capita* (L/ca/day)		
	ADD	BD	SD_{Q3}	ADD	BD	SD_{Q3}
2022	562	424	143	218	165	56
2023	496	342	120	192	133	47
2024	508	424	146	197	164	56
Average 2022-2024	522	397	136	203	154	53
*assumes 2.58 ca/lot, based on census data						

The above results in the following existing residential demands:

- Base demand of 154 L/ca/day, and
- Peak quarter seasonal demand of 136 L/lot/day.

The base demand of 154 L/ca/day is low relative to design standards and typically observed rates in BC. This may be representative of the awareness of water conservation in the community, or due to lower occupancy from seasonal properties.

3.2. REVIEW OF OUTDOOR WATER USE

Properties within the Cowan Point Utility Company have a restrictive covenant that limits outdoor water use: residents should "not use any water system or devices used to water outside plants or vegetation unless they are drip irrigation fed by cisterns with control valves, matched sprinkler heads and automatic shut off hoses all of a type and with specification as approved by Cowan Point Utility from time to time."

To assess if this restrictive covenant is being followed, the summer and winter water use was compared for properties that showed year-round water consumption indicative of regularly occupied use (average >100 L/day in all quarters). This was compared for properties with the restrictive covenant versus Highland Estates (subject to the utility's water tariff no. 5) (see Figure 3). This shows that most properties have some increase in water use in summer, with many properties doubling their water use in the summer (summer water use >200% of winter water use). This indicates there are potential further water reductions that could be realized if outdoor water restrictions were more strictly enforced.

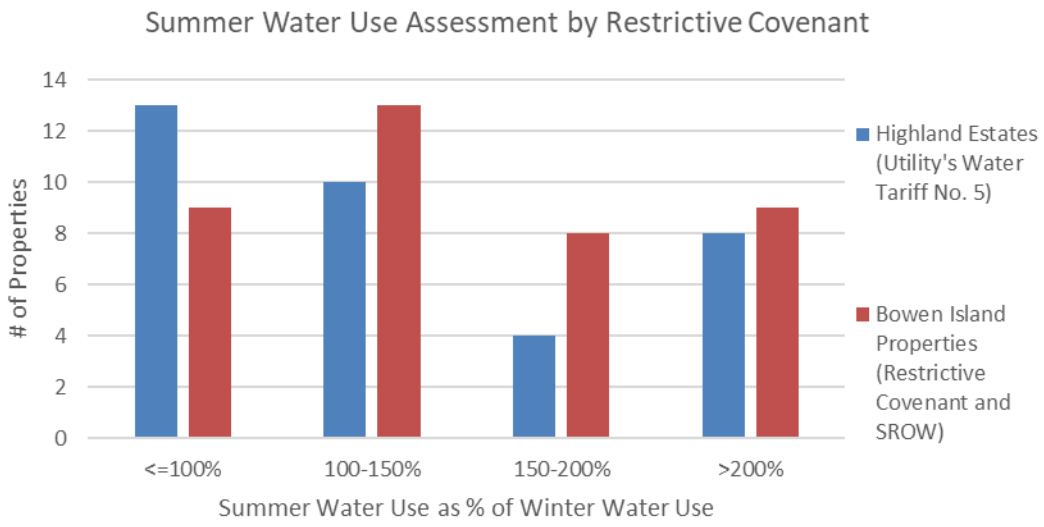

Figure 3: Summer water use as percentage of winter water use by restrictive covenant area

3.3. ICI POPULATION EQUIVALENTS

There are two serviced ICI properties, the WWTP and the golf course. As noted, these two properties have metered consumption records for 2024 Q2-Q4 only.

ICI population equivalents (PE) and single-family residential equivalents (SFRE) were calculated using 2024 peak quarter (Q3) unit demand rates (269 L/ca/day, 693 L/lot/day) and Q3 ICI consumption readings. The resulting PEs and single-family residences equivalents (SFREs) are provided in Table 6, and compared to the previous Cowan Point allocations (Bowen Island Properties, 2024). Note that the golf course is currently only authorized for 3 SFRE of consumption (and is billed for consumption in excess of this amount) and has exceeded this in the two billing periods. The utility expects the golf course consumption to be reduced to be in-line with the approved amount (3 SFRE). For conservative projections, we have allowed 4 SFRE for the golf course and 1 SFRE for the WWTP.

Table 6: 2024 Q3 ICI PEs and SFREs

ICI Property	Previous Allocation		2024 Q3 Calculation			
	PEs	SFRE (at 2.6 PE/SFRE)	Q3 Demand (L/s)	Q3 Res Unit Demand	PEs	SFRE (at 2.58 PE/SFRE)
Golf Course	7.8	3.0	0.0235	269 L/PE/day	7.55	3.99
WWTP	2.6	1.0	0.0002		0.06	0.03
Total	10.4	4.0	0.0237	-	7.61	4.02

3.4. NON-REVENUE WATER

It is noted that recorded filtered water flows are significantly greater than the metered consumption, as shown in Figure 4. This difference is referred to as non-revenue water (NRW), which typically includes leakage and other unaccounted for water uses (such as hydrant uses). The calculated NRW water rates are as shown in Table 7.

NRW has been increasing steadily to the end of 2023 where it has remained high but stable at approximately 1.2 L/s from Q4 2023 to Q3 2024. NRW dropped significantly (58% reduction) in Q4 2024 as repairs and adjustments were made to address the high flows.

It was noted by Bowen Island Properties that, to maintain required Vancouver Coastal Health chlorine residuals, there are five bleed lines at the ends of the water distribution piping. These bleed lines and their estimated flows are shown in Table 8 for reference, as provided by Bowen Island Properties. In late 2024, some repairs and adjustments were made to reduce NRW, which was reflected in the measured Q4 NRW.

The Q4 NRW is still high relative to the metered consumption (108%) but is consistent with the estimated flow from the bleed valves. Further investigation into reducing the use of bleed valves and finding alternate methods to maintain chlorine residuals in the system (i.e. looping) should be considered. As the Q4 NRW represents the value after these repairs, this has been used as the assumed value moving forward (435 L/connection/day).

Figure 4: WTP flows vs Residential Consumption

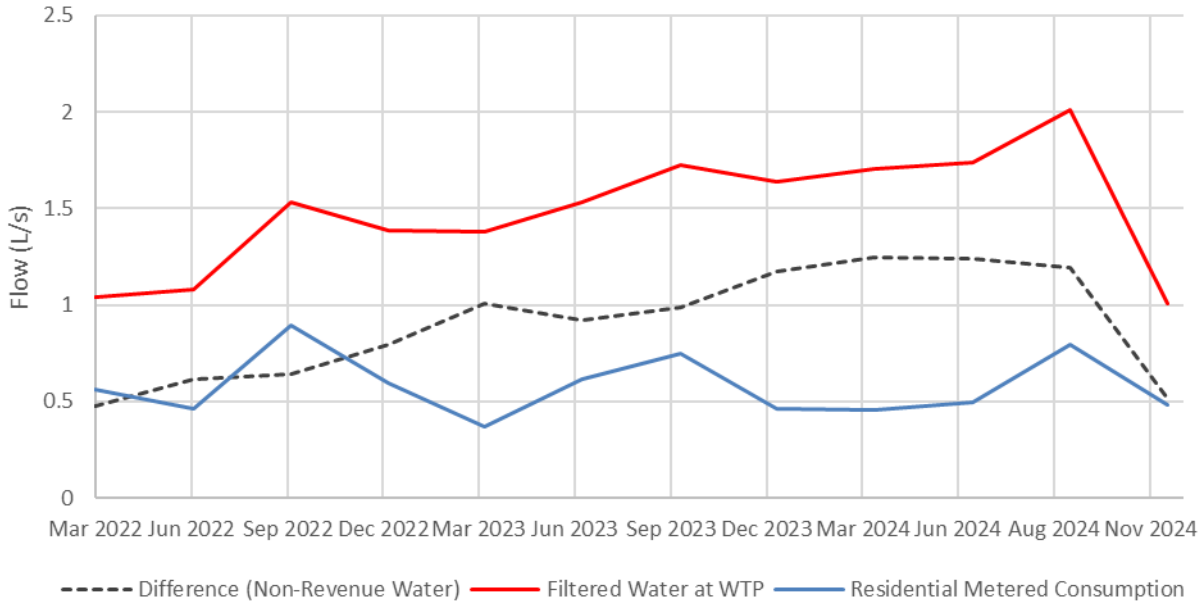

Table 7: Non-revenue water

Year	Quarter				Annual Average	NRW as % of Treated Water
	Q1	Q2	Q3	Q4		
L/s						
2022	0.47	0.61	0.64	0.79	0.63	50%
2023	1.01	0.92	0.99	1.17	1.02	65%
2024	1.25	1.24	1.19	0.52	1.05	65%
L/connection/day						
2022	405	526	548	678	539	-
2023	860	786	846	1,004	874	-
2024	1,068	1,038	999	435	885	-

Table 8: Bleed valve flow estimates (L/s)

Bleed Valve Location	Before Jun 2023	From Jul 2023 (after Arbutus Bay Ln valve repaired)
Josephine Dr	0.18	0.18
Salal Dr	0.13	0.13
Forest Ridge Rd	0.13	0.13
Seymour Bay Dr	0.13	0.13
Arbutus Bay Ln	0.32	0.10
Total	0.88	0.65

3.5. COMPARISON TO PREVIOUS VALUES

Using the demands developed from the 2022-2024 meter data, and non-revenue water rates, the existing (2024) water demands are estimated as shown in Table 9, and compared to values used in the 2010 KWL study.

The indoor base demand is observed to be much lower than the study design demand (154 L/PE/day vs 280 L/PE/day), which may be due to low occupancy in some residences (i.e., vacation properties) or highly efficient use. It does appear that the residential metered usage from 2022-2024 is lower than the usage from 2003-2009 (522 L/lot/day vs 685 L/lot/day), which may be a result of more efficient fixtures being adopted.

Note that the NRW is very large, much higher than the design estimate used in 2010 (435 L/lot/day vs 104 L/lot/day). Despite the large NRW value, the total daily use is less than the total design value previously used (957 L/lot/day vs 1,014 L/lot/day).

Table 9: Water Use Comparison

Source	Indoor BD (L/PE/day)	ADD (excl. NRW) (L/PE/day)	PE/lot	ADD (excl. NRW) (L/lot/day)	NRW (L/lot/day)	Total Daily Use (L/lot/day)
2010 KWL Study Design Demand	280	350	2.6	910	104	1,014
2003-2009 metered (2010 KWL Study)	-	346	1.98	685	n/a	n/a
Observed Average 2022-2024	154	203	2.58	522	435*	957
*NRW estimate from 2024 Q4 only, as it represents NRW after system repairs.						

4. FUTURE DEMAND PROJECTION

The following components should be considered:

- Indoor water use: The observed average appears to be lower than previously forecast. The current value is low compared to other jurisdictions. Further reductions in per capita indoor water use should not be expected.
- Outdoor water use: Assessment of summer water use data indicates that despite outdoor water use restrictions, some customers are still using significant amounts of water for outdoor use. Reducing this through education and enforcement could further reduce the per-capita water use.
- NRW: The actual NRW is approximately 4x the design value used in 2010. This should be the easiest category for water use reductions.

The following adjustments to the 2010 design values could be justified:

- Reduction of the indoor water demand from 280 L/PE/day to 200 L/PE/day (conservative estimate compared to the observed 154 L/PE/day).
- Maintain the same outdoor water demand of 70 L/PE/day (observed is currently approximately 49 L/PE/day)
- Maintain assumed 2.6 PE/lot (similar to census rate of 2.58 ca/lot)
- The current NRW reduced by half to 220 L/lot/day, which would be a NRW rate of 24%, which should be feasible in this system.

Table 10: 2025 Proposed Design Values

Source	Unit	2010 Design Values	Proposed 2025 Design Values
Indoor water demand	L/PE/day	280	200
Outdoor water demand	L/PE/day	70	70
Subtotal (metered water use)	L/PE/day	350	270
Assumed people per lot	PE/lot	2.6	2.6
Subtotal (metered water use)	L/lot/day	910	702
NRW	L/lot/day	104	220
Total design water demand	L/lot/day	**1,104**	**922**

According to information provided by Bowen Island Properties, there are currently 231 allocated or committed units. Assuming the estimated maximum lake yield of 126,000 m^3/yr remains (see Capacity Assessment in 5), the number of units that can be supported under each design condition are summarized in the following table.

Table 11: Available units and people under various design values

	2010 Design Values	Proposed 2025 Design Values	Proposed 2025 Design Values with 2010 NRW Value*
Current SFRE Allocated	231	231	231
Additional Units	109	143	197
People/Unit	2.6	2.6	2.6
Additional People	283	372	512
*2010 NRW value of 104 L/lot/day			

We note that the above table assumes 2.6 ca/lot, which is consistent with single-family properties. The construction of multi-family buildings with smaller units may justify lower persons/lot assumptions. Bowen Island Properties has proposed a breakdown of additional units at the Seymour Landing development (Table 12), showing an additional 251 people, which is within the estimated remaining capacity based on the 2010 design values.

Table 12: Proposed Seymour Landing Unit Counts

Unit Type	Size (sqft)	# of units	People/Unit	# of people
1-bed	600	21	1.5	31
1-bed + den	850	55	1.5	82
2-bed	1,100	55	2.2	121
3-bed	1,750	7	2.6	18
Totals		**137**		**251**

5. LAKE CAPACITY ASSESSMENT

Reservoir level data and rainfall data were reviewed. Since the spillway was raised in 2009 (approximately 15 years of data), the lowest water level observed occurred in 2015 (particularly hot, dry year) with a minimum lake elevation of 243.41 m. Comparatively, the 2010 modelling (1962-2010, 48 years) showed annual lake minimums in the range of 242.3 m to 243.2 m (Figure 5). It appears that recent lake levels are consistent with 2010 modelling, but further modelling using hydrologic model, the depth-storage curve, and recent years of rainfall/lake level data should be performed to validate the 2010 model.

The 2010 KWL report analyzed the rainfall for the period of 1962-2002, with rainfall predicted by correcting a nearby rain gauge to Josphine Lake. The period of 1962-2002 (40 years), had a minimum annual precipitation occurring in 1985 with an annual total of 997 mm. We note that the provided rainfall data for Josephine Lake had observed annual rainfall of 843 mm and 945 mm in 2022 and 2023, respectively, which appears to indicate that the assumed rainfall in the 2010 report may not be representative of the current conditions and the impacts of climate change.

The 2010 report suggests that “the result of this climate change scenario would be a larger water level fluctuation in the reservoir with lower summer water levels. However, the reservoir will be able to fill faster during the wet season. Therefore [...] an overall upward trend in precipitation is expected thereby increasing the maximum annual withdrawal”. There is insufficient quality of rainfall data at Josephine Lake to assess if there is an overall upward trend in precipitation observed. Analysis of rainfall data from nearby rain gauges with more complete datasets should be conducted to verify the inputs to the 2010 report water balance and the climate change assumptions.

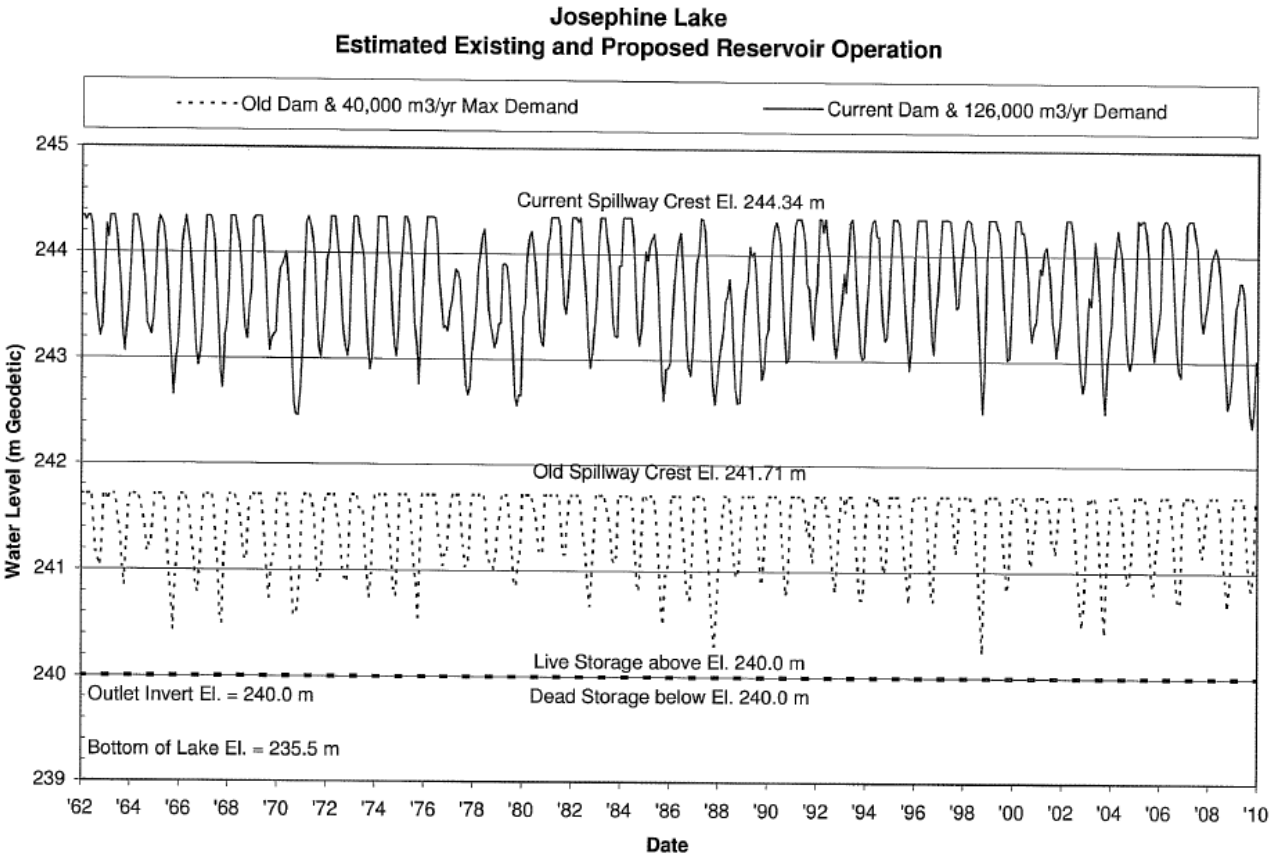

Figure 5: Reservoir operation (Kerr Wood Leidal, 2010)

6. CONCLUSIONS AND RECOMMENDATIONS

A review of water meter data indicates that the indoor water use is lower than the 2010 design value (154 L/ca/day vs 280 L/ca/day). The current outdoor water use is similar to the design value (49 L/ca/day vs 70 L/ca/day) but could be reduced with education and enforcement of the outdoor water use restrictions. The NRW is significantly higher than design (435 L/lot/day vs 104 L/lot/day) despite repairs completed in 2024. Further measures to reduce NRW should be taken, including:

- Review of bleed valves and reducing flow to amount necessary to meet health requirements
- Metering bleed valve use
- Feasibility assessment of looping improvements or other capital upgrades to improve water quality
- Regular monitoring of NRW through comparison of customer metered water use and treated water flows

There are currently 231 units allocated out of a maximum of 340 units (based on 2010 analysis). If the design values were adjusted to better reflect the recent observed metered water usage, an additional 34 units could be serviced (88 additional people at an assumed 2.6 ca/unit). With significant reductions in non-revenue water (primarily due to bleed valves) this could be increased to an additional 88 units over existing maximum (228 additional people). A full breakdown of additional units and people is available in Table 11 (page 11).

The current maximum lake yield was estimated by KWL to be 126,000 m^3/yr. The data reviewed does not indicate that this value is incorrect, but a review of recent data (2010-2024) should be completed to verify previous modelling is accurate. Confirmation of the long-term yield is critical to the viability of the future build-out.

The proposed Seymour Landing development has a total of 137 units with a population of 251 people. Based on the assumptions in this report, and subject to the additional work recommended, it is assessed that this population can be supported by the currently estimated lake yield of 126,000 m^3/year.

WATER STREET ENGINEERING LTD. *(EGBC permit to practice # 1000830)*

Laura Christensen, PEng
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REFERENCES

Bowen Island Properties. (2024). *Water Supply Unit Allocations - Cowan Point.*
Kerr Wood Leidal. (2010). *Cowan Point/Josephine Lake Development. Review of Water Supply. 2010 Update.*
Statistics Canada. (2023). *Census Profile. 2021 Census.*

ABBREVIATIONS

ADD -Average Day Demand
BD – Base Demand
ICI – Industrial Commercial Institutional (water use categories)
KWL – Kerr Wood Leidal Associates Ltd.
PE – Population Equivalents
NRW – Non-Revenue Water
SD – Seasonal Demand
SFRE – Single Family Residence Equivalents
WTP – Water Treatment Plant
WWTP – Wastewater Treatment Plant

STATEMENT OF LIMITATIONS

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Version	Status	Date	Description of Revisions	Author
A	Draft	10 Feb 2025	Original	LC
0	Final	21 Feb 2025	Final	LC

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