

DISTRICT OF SQUAMISH
REPORT NUMBER: 221-11672-00

2024 WATER MASTER PLAN UPDATE PROJECT REPORT

DECEMBER 06, 2024

FINAL





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DISTRICT OF SQUAMISH

FINAL

PROJECT NO.: 221-11672-00
CLIENT REF: RFP #R22-53
DATE: DECEMBER 06, 2024

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December 06, 2024

FINAL

District of Squamish
37955 Second Avenue
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Attention: David Roulston, P.Eng., Senior Manager of Infrastructure Planning

Dear Sir:

Subject: 2024 Squamish Water Master Plan
Client ref.: RFP #R22-53

WSP is pleased to submit this final report for the 2024 Squamish Water Master Plan Update. WSP has updated the water network to represent existing (2023) and future (2041) conditions. The model has been calibrated and employed as a tool to predict the system's behaviour under both 2023 and 2041 conditions.

Our team looks forward to our continued collaboration to manage the water system's continued growth. I warmly invite any comments you may have which arise from this report.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Michael Levin', is written over a light grey rectangular background.

Michael Levin, P. Eng., PMP
Project Manager

CL/AM/BM/ML/ab
WSP ref.: 221-11672-00

REVISION HISTORY

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Prepared by	Approved By			
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Hydraulic Modeller

December 6, 2024

Date

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The seal is circular with a double-line border. The outer ring contains the text 'PROFESSIONAL' at the top, 'OF' in the center, and 'BRITISH COLUMBIA ENGINEER' at the bottom. The inner circle contains the text 'M. LEVIN' and '# 48883'. Below the seal, the date '2024-12-06' is printed.

Michael Levin, P. Eng., PMP
Project Manager
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December 6, 2024

Date

WSP CANADA INC. 2024-12-06

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TABLE OF CONTENTS

1	EXECUTIVE SUMMARY.....	1
1.1	Introduction.....	1
1.2	Water Supply.....	1
1.3	Water Pump Stations	1
1.4	Water Storage	1
1.5	Distribution Network	2
1.6	Bill 44 Driven Impacts	2
1.7	Ancillary Studies	3
2	INTRODUCTION.....	4
2.1	Scope of Work	4
3	EXISTING WATER SYSTEM.....	5
3.1	System Overview.....	5
3.2	Water Supply and Treatment.....	8
3.3	Pump Stations	9
3.4	Pressure Reducing Stations	9
3.5	Storage Reservoirs	10
3.6	Distribution System	11
4	MODEL UPDATES.....	13
4.1	Scenario Development.....	13
4.2	Infrastructure Updates.....	13
4.3	Population and Demand Allocation.....	13
4.4	Existing Demands	14
4.5	Future Water Demands	15
4.6	Water Demand by Zone	15
5	MODEL CALIBRATION.....	17
5.1	Hydrant Test Program.....	17



5.2	Field Calibration Results	17
6	DESIGN CRITERIA.....	19
6.1	Service Pressure Design Standards	19
6.2	Maximum Velocity	19
6.3	Fire Protection and Storage	19
6.4	Supply Storage	20
6.5	Other Criteria	21
7	HYDRAULIC ANALYSIS	22
7.1	Source Supply Capacity	22
7.1.1	Source Supply Recommendations.....	22
7.2	Storage Reservoirs	22
7.2.1	Existing Reservoir Storage	23
7.2.2	Storage Capacity Assessment	23
7.2.3	Storage Reservoir Recommendations.....	25
7.3	Pumping Capacity Analysis	26
7.3.1	Existing Pump Capacity	26
7.3.2	Pump Capacity Assessment.....	26
7.4	Distribution System Analysis.....	27
7.4.1	Average Day Demand.....	27
7.4.2	Peak Hour Demand.....	31
7.4.3	Fire Flow Analysis	34
7.4.4	Distribution System Recommendations	37
7.5	Bill 44 Impact Assessment.....	42
7.5.1	Preliminary Review	42
7.5.2	Storage Reservoir Analysis	42
7.5.3	Storage Capacity Analysis.....	43
7.5.4	Pumping Capacity Analysis	44
7.5.5	Fire Flow Analysis	44
7.5.6	Bill 44 Driven Distribution System Recommendations.....	48
8	SYSTEM IMPROVEMENTS	49
8.1	Cost Estimate Basis	49



8.2	Capital Projects Lists	50
8.3	Financial Model.....	54
8.3.1	Water Rate Increases	54
9	ANCILLARY STUDIES	55
9.1	Long-Term Source Development Strategy	55
9.1.1	Summary and Recommendations	55
9.2	Water Conservation Plan	56
9.2.1	Summary and Recommendations	56
9.3	AC Watermain Renewal Program	57
9.3.1	Summary and Recommendations	58
9.4	Future Projects	58
9.4.1	Water Supply Trunk Main	58
9.4.2	Assessment of Powerhouse Springs Supply Main.....	59
9.4.3	Assessment of Powerhouse Springs' Long-Term Capacity.....	59

TABLES

TABLE 3-1:	WATER SYSTEM SUMMARY	5
TABLE 3-2:	EXISTING WELLS AT POWERHOUSE SPRINGS.....	8
TABLE 3-3:	EXISTING SUPPLY SOURCES	9
TABLE 3-4:	DISTRICT OF SQUAMISH PUMP STATIONS	9
TABLE 3-5:	DISTRICT OF SQUAMISH PRESSURE REDUCING STATIONS.....	10
TABLE 3-6:	DISTRICT OF SQUAMISH STORAGE RESERVOIRS	11
TABLE 3-7:	EXISTING WATERMAINS.....	11
TABLE 4-1:	SUMMARY OF WATER DEMANDS BY LAND USE TYPE UNDER CURRENT CONDITIONS	14
TABLE 4-2:	SUMMARY OF WATER DEMANDS BY LAND USE TYPE FORECASTED IN 2041.....	15
TABLE 4-3:	AVERAGE DAY DEMANDS BY PRESSURE ZONE	15
TABLE 5-1:	MODEL C-FACTORS	17
TABLE 6-1:	SERVICE PRESSURE REQUIREMENTS	19
TABLE 6-2:	MINIMUM FIRE FLOW REQUIREMENTS UNDER EXISTING AND FUTURE SCENARIOS.....	20



TABLE 6-3:	DURATION OF FIRE FLOW PER FIRE UNDERWRITERS' SURVEY FOR STORAGE CAPACITY ASSESSMENT	20
TABLE 7-1:	EXISTING SOURCE CAPACITIES	22
TABLE 7-2:	EXISTING RESERVOIR CONTRIBUTIONS ..	23
TABLE 7-3:	STORAGE CAPACITY ANALYSIS	24
TABLE 7-4:	EXISTING PUMP CAPACITIES	26
TABLE 7-5:	PUMP CAPACITY ANALYSIS.....	26
TABLE 7-6:	PRESSURES DURING AVERAGE DAY DEMAND BEFORE CAPITAL IMPROVEMENTS.....	27
TABLE 7-7:	PRESSURES DURING PEAK HOUR DEMAND BEFORE CAPITAL IMPROVEMENTS.....	31
TABLE 7-8:	NUMBER OF DEFICIENT FIRE FLOWS COINCIDENT TO MAXIMUM DAY DEMAND	34
TABLE 7-9:	STORAGE CAPACITY ANALYSIS UNDER HIGHER FIRE-FLOW REQUIREMENTS TRIGGERED BY BILL 44	43
TABLE 7-10:	NUMBER OF DEFICIENT FIRE FLOWS COINCIDENT TO MAXIMUM DAY DEMAND UNDER HIGHER FIRE-FLOW REQUIREMENTS TRIGGERED BY BILL 44 ..	44
TABLE 8-1:	SUMMARY OF UNIT RATES USED FOR CAPITAL IMPROVEMENT PLAN	49
TABLE 8-2:	CAPITAL PROJECTS LIST	51
TABLE 9-1:	SUMMARY OF COSTS FOR LONG-TERM SOURCE DEVELOPMENT STRATEGIES	55
TABLE 9-2:	WATER CONSERVATION PLAN SCHEDULE AND BUDGET	57

FIGURES

FIGURE 3-1:	DISTRICT OF SQUAMISH WATER NETWORK MAP	6
FIGURE 3-2:	DISTRICT OF SQUAMISH WATER SYSTEM SCHEMATIC.....	7
FIGURE 7-1:	AVAILABLE SERVICE PRESSURES IN AVERAGE DAY DEMAND (2023).....	29
FIGURE 7-2:	AVAILABLE SERVICE PRESSURES IN AVERAGE DAY DEMAND (2041).....	30
FIGURE 7-3:	AVAILABLE SERVICE PRESSURES IN PEAK HOUR DEMAND (2023)	32
FIGURE 7-4:	AVAILABLE SERVICE PRESSURES IN PEAK HOUR DEMAND (2041)	33
FIGURE 7-5:	AVAILABLE FIRE FLOWS COINCIDENT TO MAXIMUM DAY DEMAND (2023).....	35



FIGURE 7-6:	AVAILABLE FIRE FLOWS COINCIDENT TO MAXIMUM DAY DEMAND (2041).....	36
FIGURE 7-7:	SERVICE PRESSURES DURING FUTURE AVERAGE DAY DEMAND (2041) WITH IMPROVEMENTS.....	38
FIGURE 7-8:	SERVICE PRESSURES DURING FUTURE PEAK HOUR DEMAND (2041) WITH IMPROVEMENTS.....	39
FIGURE 7-9:	AVAILABLE FIRE FLOWS COINCIDENT TO FUTURE MAXIMUM DAY DEMAND (2041) WITH IMPROVEMENTS	40
FIGURE 7-10:	AVAILABLE FIRE FLOWS COINCIDENT TO FUTURE MAXIMUM DAY DEMAND (2041) WITH IMPROVEMENTS AND WITH VELOCITY CONSTRAINTS OF 3.5 M/S.....	41
FIGURE 7-11:	AVAILABLE FIRE FLOWS COINCIDENT TO MAXIMUM DAY DEMAND (2023) UNDER HIGHER FIRE-FLOW REQUIREMENTS TRIGGERED BY BILL 44	46
FIGURE 7-12:	AVAILABLE FIRE FLOWS COINCIDENT TO MAXIMUM DAY DEMAND (2023) WITH IMPROVEMENTS (INCLUDING BILL 44 DRIVEN UPGRADES).....	47

APPENDICES

- A** LONG TERM SOURCE DEVELOPMENT REVIEW
- B** WATER CONSERVATION PLAN
- C** AC WATERMAIN RENEWAL PLAN UPDATE
- D** WATER & SEWER UTILITIES RATE STUDY
- E** HYDRANT FLOW TEST SET
- F** CALIBRATION RESULTS

1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

The 2024 Water Master Plan update (2024 WMP) presents an updated snapshot of the District’s drinking water distribution network. By considering the current system’s ability to service future demands for drinking water, the 2024 WMP will guide the District in prioritizing its required infrastructure upgrades and renewals strategically and cost-effectively to continue to provide a high-quality drinking water service to its residents. A hydraulic water model was used to assess the performance of the District of Squamish’s water system. Each time horizon was analyzed under average day demand, maximum day demand, and peak hour demand conditions.

1.2 WATER SUPPLY

The water system in the District sources its raw groundwater from wells situated in the Powerhouse Springs well field. This water is of high quality, drinkable, and undergoes no treatment except for disinfection. The District is also configured to draw water from Stawamus River and Mashiter Creek, however, these sources do not provide reliable water quality year-round and have led to boil water advisories in the past. In the past twenty years, enhancements to the water system have enabled the District to reduce its dependence on surface water from the Stawamus River and Mashiter Creek, which have not been used in the last 10 years and function only as emergency backups to Powerhouse Springs.

The Powerhouse Springs well field faces limitations in its potential water supply. According to the Long-Term Source Development Review Memo (refer to Appendix A), WSP found that while the well field can currently meet the existing maximum day demand (MDD) of 255 L/s in the District, projections indicate that by 2026, the MDD (262 L/s) will surpass the existing capacity (255 L/s) if no upgrades are implemented. To address this, the District must enhance its supply capacity. This includes installing additional wells and pumps at Powerhouse Springs in the short term and developing an additional water supply source by 2041. The Stawamus River should be thoroughly evaluated as a potential supplement to meet the District’s future water needs.

1.3 WATER PUMP STATIONS

Every water pump station in the District has sufficient capacity to pump water to the storage reservoirs, fulfilling both the current (2023) MDD and the projected growth needs up to 2041. At this time, there are no suggestions for improvements or upgrades to any of the District’s pump stations.

1.4 WATER STORAGE

Water storage reservoirs are designed to hold water for managing peak water demands, ensuring fire safety, and preparing for emergencies in the water system. A study of the District’s reservoirs indicates that some may not have the ideal capacity. However, in some situations, these storage shortfalls can be mitigated by cascading water from pressure zones at higher elevations to those at lower elevations via PRV stations, which connect different regions of the District.

Specifically, by 2041, the Plateau and Thunderbird Reservoirs are projected to fall short of the necessary storage capacities. Given operational concerns, it is advised to investigate their current conditions in the short term to determine whether to either expand these reservoirs or build new ones in the vicinity to rectify these shortcomings.

1.5 DISTRIBUTION NETWORK

WSP has revised the District's current hydraulic water model to assess the present (2023) service level being offered to its residents, and to envision the system's configuration under the projected growth scenario for 2041. An analysis was conducted on system pressures and available fire flows coincident to maximum day demand across all scenarios. The process of selecting enhancements to the water system was undertaken with a focus on rectifying existing shortcomings, while also ensuring they are scaled for future growth.

The multitude of upgrades to transmission mains and watermains that were evaluated and selected will rectify a significant portion of the District's fire flow inadequacies. These upgrades have been incorporated into the District's list of Capital Projects.

There are six categories considered for water infrastructure Capital Projects List:

- 1 Capital Projects List Upgrades** – these are projects that would resolve existing pressure and fire flow deficiencies in the District's water system and are chosen mainly due to the large number of deficiencies they resolve. One reservoir upgrade is also included to provide for adequate volumes of water during a fire coincident with maximum day demand. The total estimated cost of these upgrades is \$11.1 million.
- 2 Bill 44 Projects** – these are projects that would resolve future fire flow deficiencies in the District's water system as well as on major facilities as a result of Bill 44-driven upgrades by developers. The total estimated cost of these upgrades is \$2.9 million.
- 3 Other Capital Projects** – these are projects that the District has carried over from previous condition assessment studies, asset management plan recommendations, capital plan reports, and the DCC bylaw. These upgrades also improve the system reliability through the replacement of aging water infrastructure such as PRVs in the District's water system. The total estimated cost of these upgrades is \$3.6 million.
- 4 Long-Term Source Development Strategy Costs** – these consist of near-term and medium-term costs associated with increasing the system's supply capacity. Near-term costs include the installation of an additional well at the Powerhouse Springs well field estimated at \$1.0 million. Medium-term costs include the evaluation and development of a secondary water source estimated at \$2.1 million.
- 5 AC Watermain Renewal Program** – A strategic replacement strategy for AC watermains prioritized by a risk rating which allows for capital expenditures to be earmarked for higher-risk assets in the District's system. Currently, with the updated age rating, the majority of AC watermains are classified as medium or high risk and have been prioritized for replacement within 15 years. By deferring low-risk AC watermain renewals by 15 years (start replacement by 2041), the total cost for replacing high-risk and medium-risk AC watermains is \$43.9 million over the next 15 years (2025-2040), replacing 26 km of watermains.
- 6 Water Conservation Plan** – A strategic prioritization approach that aims to enhance the District's metering systems, modernized leak detection techniques, bylaw revisions, infrastructure improvements, and the implementation of conservation-focused rate structures. The total estimated cost is \$40,000.

In summary, the projected total expenditure for the recommended upgrades in the Water Master Plan stands at \$64.9 million over the next 16 years (2024-2041). This estimate takes into account an allowance of 15% for engineering fees and 15% for contingency.

1.6 BILL 44 DRIVEN IMPACTS

WSP has evaluated the effects of Bill 44 on the District's water network for the 2041 scenario. For this assessment, the fire-flow requirement for new multi-family parcels is assumed to increase to 90 L/s, compared to the previous 60 L/s requirement for single-family areas. The proposed upgrades due to Bill 44 have been added to the District's list of Capital Projects.

The upgrades associated with Bill 44 consist exclusively of pipe upgrades spanning over 1.7 kilometres and costing approximately \$2.9 million. It should be noted that the intention is for these costs to be covered through re-development efforts, rather than being charged to the District.

1.7 ANCILLARY STUDIES

Concurrent with the development of the District’s Water Master Plan, several ancillary studies have also been carried out. While these studies don’t add directly to the Capital Projects List, they contribute to the ongoing sustainable management of the water utility in the long run. These studies are:

- **Long-Term Source Development Strategy** – This technical memorandum provides updates to the previously submitted business case in 2014 for considering water supply source expansion options, while developing upon the latest proposals for increased extraction from a new well at Powerhouse Springs in the immediate future. This includes Class D cost estimates and life-cycle cost analyses, including a detailed review of infrastructure-related requirements (such as pumping and storage requirements) that would enable the successful implementation of each strategy.
- **Water Conservation Plan** – The Water Conservation Plan builds on the District’s water conservation experience to set out a course of action for the next 17 years that will allow the District’s water utility to influence system demands in order to meet a water conservation goal. An attainable target of a 20% reduction in per capita water demand (ADD and MDD) by 2041 was selected. The updated plan recommends enhanced metering systems, modernized leak detection techniques, bylaw revisions, infrastructure improvements, and the implementation of conservation-focused rate structures. Collectively, these initiatives will establish the groundwork for the District to achieve its water conservation target.
- **AC Watermain Renewal Program** – The AC Watermain Renewal Plan identifies priority watermain assets which must be replaced expediently, as well as opportunities for deferrals through conducting a thorough risk assessment of the District’s AC watermain inventory. This includes updating the probability of failure analysis with recent replacements and current system pressures. The outcomes of this report include a financial analysis to quantify the cost implications of AC watermain replacements on the water utility.
- **Water and Sewer Utilities Rates Study** – A long-term financial plan was developed to estimate the revenue required to sufficiently fund the total estimated costs of the water utility; operations, maintenance, and inspection programs; administration; the Capital Projects List; the rehabilitation and replacement of existing infrastructure and build reserves. Refer to this study for detailed information on proposed rate changes to support the recommended conservation programs, the Capital Projects List, and contributions to reserves.

2 INTRODUCTION

The District of Squamish (Squamish) retained WSP Canada (WSP) to update its Water Master Plan. The new document will be known as the 2024 Water Master Plan (2024 WMP) and will replace the 2015 Water Master Plan, which was originally prepared by Opus DaytonKnight Consultants Ltd., now a part of WSP. The objective of the 2024 WMP update is to present an updated analysis of Squamish's hydraulic water model. This analysis was carried out to develop improvement projects and servicing strategies identified in this report.

WSP conducted a technical evaluation of the hydraulic infrastructure to assess the condition of the current water network and proposed enhancements to rectify present shortcomings and accommodate future growth projections. This involved updating the District's existing WaterCAD water model to accurately capture the network as of 2023.

The revised hydraulic model offers a means to analyze Squamish's water system for the following purposes:

- Evaluate the current hydraulic performance and operational parameters to identify immediate and medium-term enhancements needed within the system.
- Evaluate the existing system's capacity to accommodate Squamish's anticipated future water demands resulting from population growth. Thus, identify the necessary long-term improvements and upgrade initiatives necessary to support this projected growth.

This report covers the District's existing storage reservoirs, pump stations, and transmission and distribution network.

2.1 SCOPE OF WORK

The following summarizes the scope of work performed during the 2024 WMP update project:

- Gather and review information related to the water system, such as past studies, reports, drawings, operational data, et cetera from the District.
- Identify and correct known errors in the existing WaterCAD model identified by District staff.
- Incorporate changes to the District's water network from 2015 to the present, by considering updated GIS data and record drawings.
- Prepare an updated hydraulic schematic of the District's overall water distribution network.
- Develop scenarios under 2023 and 2041 conditions and allocate demands within the water model.
- Plan and implement 6 multi-pressure test sets of four tests each plus 8 C-Factor hydrant tests for model calibration purposes, in cooperation with District operations staff.
- Calibrate the hydraulic water model using data collected from the field-testing program.
- Establish distribution system and reservoir capacity design criteria requirements.
- Examine and pinpoint current and future inadequacies within the water system, suggesting necessary upgrades for each, and formulate a prioritized 17-year plan for capital improvements.
- Develop cost estimates and timelines for proposed upgrades.
- Compile a final report and slide show presentation to document the analysis conducted and outline the recommended subsequent actions upon project completion.

3 EXISTING WATER SYSTEM

This section provides an overview and general description of the existing water system in the District.

3.1 SYSTEM OVERVIEW

The District of Squamish water network contains 15 pressure zones, 9^a storage reservoirs, and over 146 km of watermain. The District’s water supply is primarily provided by seven pumps located at the Powerhouse Springs groundwater source. Two surface water intakes, one at Stawamus River and the other at Mashiter Creek, have been discontinued from regular use in recent years. However, they remain functional and are maintained for use in the event of emergency but have not been relied upon for potable water supply for more than a decade.

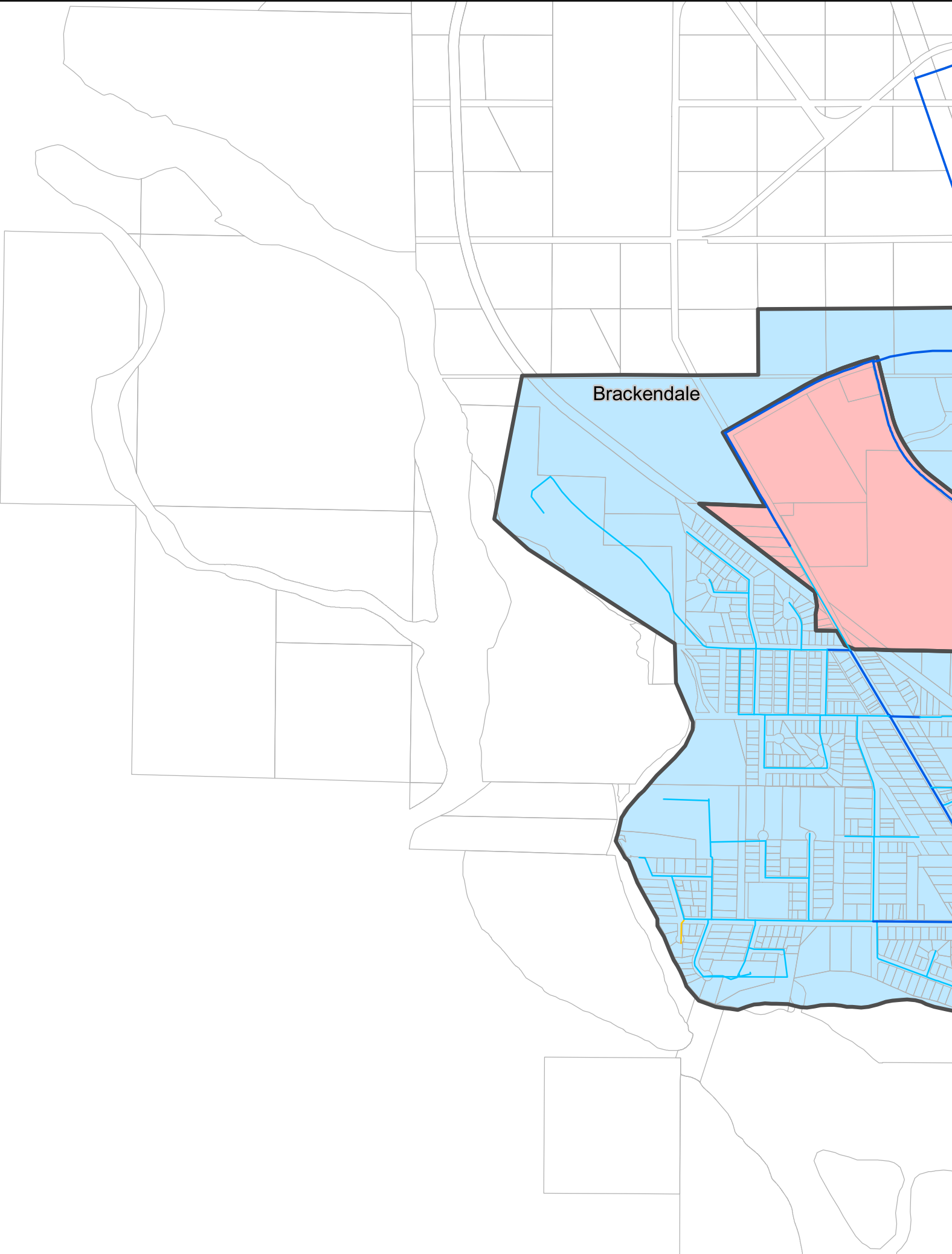
At present, the District’s water system caters to more than 29,206 residents and delivers in excess of 4.3 million cubic meters of drinkable water annually for consumption. Table 3-1 and Figure 3-1 illustrate the system’s components and the network’s layout respectively. WSP has also developed an updated hydraulic schematic showcasing the hydraulic connectivity of pivotal water mains, pump stations, storage tanks, and pressure zones (refer to Figure 3-2). The schematic depicts each significant component with a y-axis equivalent to the component’s hydraulic grade, encompassing elevation plus pressure head.

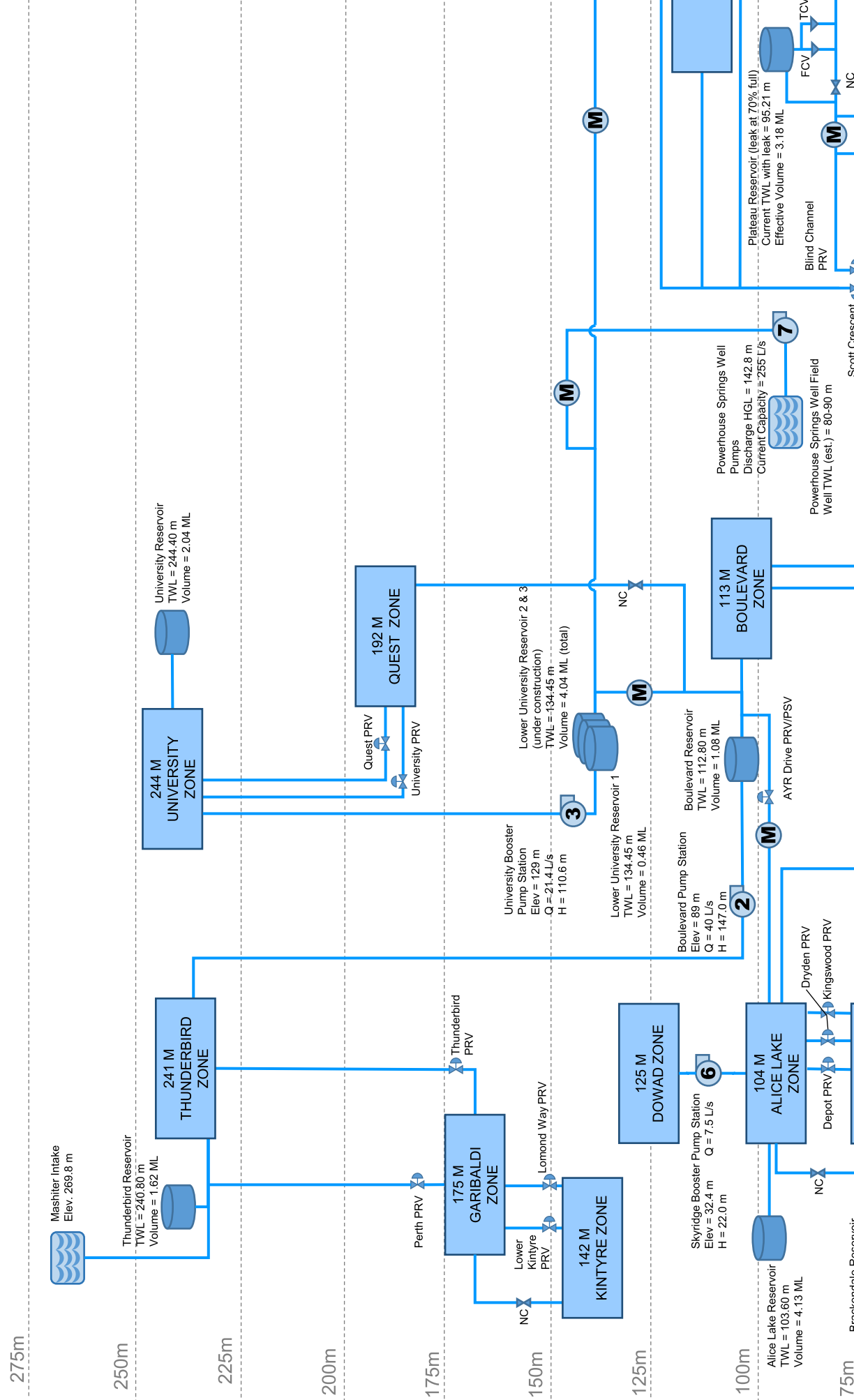
Table 3-1: Water System Summary

WATER SYSTEM COMPONENT	QUANTITY
Pressure Zones	15
Supply Sources	3
Storage Reservoirs	9 ^a
Pump Stations	4
Pressure Reducing Valves	35
Length of Watermains (in km)	146
Service Connections	8,700
Fire Hydrants (Owned by the District)	650

a. By the end of 2024, there will be a total of 9 reservoirs, which will include the newly constructed Lower University Reservoirs 2 and 3.

Brackendale





3.2 WATER SUPPLY AND TREATMENT

The District’s water supply is sourced from seven groundwater wells located at the Powerhouse Springs well site. This site is situated 5 kilometres east of the Squamish Town Center. Additionally, the District has two alternative sources from surface water supplies at Mashiter Creek and the Stawamus River.

Prior to the 1999-2000 study into the Powerhouse Springs well site and the subsequent well development, the Mashiter Creek and Stawamus River intakes had been the sole water sources for the District. However, this surface water supply is not considered sustainable for the long term due to its vulnerability to high turbidity during heavy rainfall and its inability to maintain adequate flow in the Stawamus River during low river conditions for fisheries/environmental purposes. Presently, this surface water source is maintained for emergency use only, but it necessitates the District to issue water quality or boil water advisories. Table 3-2 provides an overview of the well capacities at the Powerhouse Springs site.

Table 3-2: Existing Wells at Powerhouse Springs

MODEL ID	YEAR COMMISSIONED	PUMP CAPACITY (L/S)	MOST RECENT REHABILITATION
1	2002	89.6	2021
2	2002	48.6	2015
3	2002	94.6	2019
4	2005	24.6	2022
5	2008	43.5	2017
6	2008	57.4	2013
7	2008	11.7	2020

The combined potential yield of all pumps at the wells is estimated to be 370 L/s, which equates to a firm station capacity of a maximum of 275 L/s. The firm capacity of a facility is the total pumping capacity of all pumps combined, excluding the capacity of the largest pump.

The District holds a Project Approval Certificate, issued in 1998 under the Environmental Assessment Act, allowing a combined withdrawal of up to 255 L/s from the well field. This is contingent on a maximum of three wells operating at any given time, each with a withdrawal rate of 85 L/s. Currently, the District is in the process of registering the wells under the Water Sustainability Act, which will eventually supersede the Project Approval Certificate.

The District of Squamish also holds water licenses for both the Stawamus River and Mashiter Creek. The withdrawal limit for the Stawamus River is 132 L/s, while Mashiter Creek is 184 L/s, totaling 316 L/s. These licenses were acquired before the establishment of the Powerhouse Springs Well sites. At that time, both Mashiter Creek and Stawamus River served as the primary sources of potable water for the District. Table 3-3 provides an overview of the capacities of each potable water source within the District.

Table 3-3: Existing Supply Sources

SOURCE	ABSTRACTION LIMIT (L/S)
Powerhouse Springs Wells ^a	255
Mashiter Creek ^b	184
Stawamus Creek ^b	132

- a. The District has an Environmental Assessment certificate for abstraction of up to 255 L/s at Powerhouse Springs.
- b. The listed Maximum Daily Diversion Volume from each source as noted by the BC Water License held by the District.

3.3 PUMP STATIONS

The District of Squamish currently operates four pump stations. The most recent addition was the Skyridge Pump Station in 2017. A fifth pump station is expected to be added to the network in the near future. Table 3-4 illustrates key pump station characteristics of all District of Squamish pump stations included in the water model.

Table 3-4: District of Squamish Pump Stations

MODEL ID	PUMP STATION NAME	NUMBER OF PUMPS	DESIGN CAPACITY
2428, 2429	Boulevard	2	40 L/s @ 147 m (each)
6149, 6156	Crumpit Woods	2	5.1 L/s @ 67 m (each)
5285, 5286, 5287	University Booster	3	21 L/s @ 111 m (each)
14005, 14009, 14014, 14020, 14023, 14370	Skyridge Booster	6	Pumps 1 & 2: 2 L/s @ 22 m (each) Pumps 3 & 4: 5.8 L/s @ 30 m (each) Pumps 5 & 6: 104 L/s @ 50 m (each)

3.4 PRESSURE REDUCING STATIONS

The District of Squamish’s water network currently includes 15 pressure zones, most of which are managed by pressure-reducing valves (PRV). Table 3-5 summarizes the particulars of each PRV station, as reflected in the water model. These setpoints were provided by the District.

Table 3-5: District of Squamish Pressure Reducing Stations

MODEL ID	PRV STATION	DIAMETER (MM) – FIRE / DOMESTIC	DOWNSTREAM PRESSURE SETTING (PSI) – FIRE / DOMESTIC	PRESSURE ZONE SUPPLIED
11309 / 11312	Ayr Drive	250 / 75	60 / 90	Alice Lake
11593 / 11594	Blind Channel	250 / 100	84 / 89	Squamish River
2475	Clarke	150	52	Clarke
11048	Crumpit Woods	200	60	Crumpit Woods
2486 / 9937	Depot	150 / 50	65 / 70	Brackendale
5402	Dryden	50	75	Brackendale
14115	Hospital	200	64	Hospital Hill
11064 / 2487	Kingswood	150 / 75	85 / 90	Brackendale
14028 / 14031	Laurelwood	200 / 75	72 / 75	Squamish River
2483 / 10018	Lomond	150 / 38	47 / 65	Kintyre
11293 / 11296	Lower Kintyre	150 / 50	57.5 / 60.3	Kintyre
10668 / 12006	Maple	150 / 75	89 / 91	Westway
11576 / 11575	Perth	200 / 75	69 / 73	Garibaldi
2479 / 10806	Powerhouse	300 / 300	28 / 19.5	Stawamus
13980 / 5312	Quest	250 / 100	52 / 62	Quest
10719 / 12311	Scott Crescent	250 / 100	83 / 86	Squamish River
2494	Tantalus	250	76	Squamish River
2482 / 9952	Thunderbird	150 / 38	60 / 70	Garibaldi
12076 / 12075	University	200 / 50	77 / 85	University
11524 / 11523	Westway	200 / 75	51 / 61	Westway

3.5 STORAGE RESERVOIRS

The District of Squamish currently operates 7 storage reservoirs. Two new reservoirs, Lower University Reservoirs 2 and 3, are currently under construction. These reservoirs were modelled as tank elements in the water model and are tabulated below in Table 3-6.

Table 3-6: District of Squamish Storage Reservoirs

MODEL ID	RESERVOIR NAME	LOW WATER LEVEL (M)	TOP WATER LEVEL (M)	VOLUME (M ³)	ZONE SUPPLIED
2413	Alice Lake	92.1	103.6	4.13	Alice Lake, Brackendale
2409	Boulevard	103.5	112.8	1.08	Boulevard
6138	Crumpit Woods	168.0	173.0	0.80	Crumpit Woods
2424	Lower University Reservoir 1	127.5	134.5	0.35	Stawamus, Westway, Hospital Hill, Clarke
14220	Lower University Reservoir 2 ^a	125	134.5	2.02	Stawamus, Westway, Hospital Hill, Clarke
14221	Lower University Reservoir 3 ^a	125	134.5	2.02	Stawamus, Westway, Hospital Hill, Clarke
2410	Plateau Reservoir ^b	85.9	96.0	4.54	Squamish River
2411	Thunderbird	236.5	240.8	1.62	Thunderbird, Garibaldi, Kintyre
5283	University	235.2	244.4	2.04	University, Quest

- a. Currently under construction and not yet operational.
- b. Plateau Reservoir is operating at reduced capacity of 70% due to leakage issues.

3.6 DISTRIBUTION SYSTEM

Squamish’s distribution network comprises more than 146 kilometres of water mains serving a diverse population of over 29,206 residents, alongside various industrial, commercial, and institutional entities. The distribution pipes vary in diameter from 50 mm to 500 mm, with installation dates spanning from 1959 to 2022. Table 3-7 presents a summary of the current pipe diameters and their estimated total lengths, derived from the GIS database information supplied by the District.

Table 3-7: Existing Watermains

DIAMETER (MM)	TOTAL LENGTH (M)
50	803
75	248
100	1529
150	52,472
200	30,464
250	11,046
300	33,641
350	1,328

DIAMETER (MM)	TOTAL LENGTH (M)
400	3,764
450	5,788
500	5,059
TOTAL	146,142

4 MODEL UPDATES

WSP was tasked with the responsibility of incorporating the latest field data regarding recent construction and operational changes in the water system since the previous model update. Additionally, we conducted a thorough review of the model to identify any data deficiencies and implemented further updates related to system and demand parameters to ensure its suitability for system analysis.

4.1 SCENARIO DEVELOPMENT

A hydraulic water model, based on the District's previous models, was used to assess the performance of the District's distribution system under average day demand, maximum day demand, and peak hour demand conditions. Available fire flow was also assessed coincident to maximum day demands. Each of these four scenarios was assessed at two distinct time horizons.

- 1 2023 Existing Scenario – This horizon assesses the current level of service being offered. The District's 2015 WMP model underwent revisions incorporating documented pipe upgrades, capital improvement projects, and demands from new development areas.
 - 2 2041 Future Scenario – This horizon evaluates the level of service based on projected growth. This scenario also identifies infrastructure upgrades needed prior to this date.
-

4.2 INFRASTRUCTURE UPDATES

Newly built watermains have been identified and incorporated into the model using GIS data supplied by the District, along with record drawings of recently developed subdivisions within Squamish. The subsequent modifications have been executed to align the District's water model with the layout of the existing water system as of September 30, 2023. It should be noted that the original model from the 2016 WMP has been periodically updated by WSP; the following lists the most recent updates made.

- Updates to watermains on Bracken Park Way, Zenith Road East, Brennan Road and Rod Road, Judd Road, Eagle Run Drive, Read Crescent, Finch Drive, Raven Drive, Plateau Creek, Mamquam Road, Tantalus Pinch Point, and Government Road (from Depot Road to Axen Road).
 - Newly constructed Lower University Reservoirs were added.
 - Newly constructed watermains and corresponding demands were added for Legacy Ridge and Oceanfront Developments.
 - PRV setpoints for each PRV station were updated.
-

4.3 POPULATION AND DEMAND ALLOCATION

To cover any recent growth in the District since the last model update, water demands were accounted for at each new development under existing average day, maximum day, and peak hour static demand scenarios. The location of these new developments was determined based on record drawings provided by the District. All new development parcels were assigned average day demands per the District of Squamish's Subdivision and Development Control Bylaw 2021. A peaking factor of 2.0 was used for MDD, and 3.0 was used for PHD for all demand types. For existing parcels, no adjustments were made to their population or demands assigned to them from the 2015 model.

The District's population for 2023 is estimated to be approximately 29,206 based on the latest figures from Statistics Canada.

Future demands were developed utilizing population estimates for Traffic Area Zones (TAZ) provided by ISL Engineering for the purposes of the 2023 Transportation Master Plan. Population equivalents from the District of

Squamish’s Subdivision and Development Control Bylaw (No. 2649) 2018 were applied to these TAZ population estimates to generate demand estimates. An annual population growth rate of 4% was calculated based on the existing population derived from the latest Stats Canada estimate and the future populations derived from TAZ estimates. Based on discussion with the District, this is consistent with historical growth levels observed by the District.

Using a 4% annual compounded growth rate as the basis, the District is projected to have a residential population of 60,400 by the year 2041. This forecast is considered conservative as it assumes a 4.0% increase over both single-family and multi-family zoning. It’s worth mentioning that the TAZ data observed larger rises in the residential population, specifically multi-family, compared to less significant increases in ICI (industrial, commercial, and institutional) developments.

4.4 EXISTING DEMANDS

A system’s ADD is the average demand in the water system over an entire year. ADD is useful for analyzing historic demands and general usage patterns in the District and in estimating future demands. The future ADD is important in determining the average water supply requirements for the water system. According to the District’s water consumption data, the ADD in 2023 was 156 L/s, marking an approximate 30% increase compared to the previous water master plan. This can be attributed to new property developments within the District.

A system’s MDD provides an estimation of the maximum water usage per capita for one day (often the hottest summer day) in a year. It is used for sizing the District’s reservoir storage capacities, distribution system pumping capacities, and transmission mains. In 2023, the District recorded an MDD of 245 L/s, reflecting a 17% increase compared to the previous water master plan.

A system’s PHD is an estimation of the maximum hour of water usage of the system during a day in a certain year. The peak hour demand usually occurs on or around the day when MDD occurs. The PHD is calculated through peak water usage from the source, as well as the consumption of balancing storage in the system reservoirs. In pressure zones without reservoirs, the supply must meet this total peak hour demand. The PHD estimated for 2023 is 343 L/s, which represents an increase of 53% from the previous water master plan.

Table 4-1 below summarizes the ADD, MDD, and PHD calculated for residential and non-residential (ICI) customers. System peaking factors, which compare peak hour demands versus average day demands, were calculated at 2.2. The PHD system peaking factors have risen from the 2015 WMP due to the demand estimation approach taken.

Table 4-1: Summary of Water Demands by Land Use Type (2023)

TYPE	ADD (L/S)	MDD (L/S)	PHD (L/S)
Single-Family	52.8	98.1	119.7
Multi-Family	51.7	82.8	126.8
Commercial	17.5	20.0	29.4
Industrial	20.6	29.0	44.4
Institutional	13.7	15.3	22.2
TOTAL	156	245	343

4.5 FUTURE WATER DEMANDS

WSP forecasted the future consumption of the District of Squamish’s water system users in 2041 through a combination of TAZ population estimates and existing per capita demand rates. The resulting average day, maximum day, and peak hour demands for the water system in the 2041 horizon are presented in Table 4-2. Many of the land use types see increased demands versus existing conditions, resulting from densification and population growth. Meanwhile, WSP predicts industrial water demands to be replaced by commercial demands as the District’s core industrial lands continue to be redeveloped into mixed-use areas due to rising property prices.

Table 4-2: Summary of Water Demands by Land Use Type (2041)

TYPE	ADD (L/S)	MDD (L/S)	PHD (L/S)
Single-Family	64.3	155.8	193.3
Multi-Family	128.2	230.8	256.3
Commercial	40.8	61.3	61.1
Industrial	8.2	12.4	12.4
Institutional	12.7	19.0	19.0
TOTAL	254	479	542

4.6 WATER DEMAND BY ZONE

The current District of Squamish water distribution network contains 15 pressure zones. Of these, three zones have been newly created over the past ten years to facilitate greenfield development: Crumpit Woods, Dowad, and Quest. Given land availability within District limits, WSP has assumed that future growth will be driven by infill development or by development increasing the areas of existing pressure zones. Table 4-3 provides an overview of each pressure zone’s average day consumption in both the current and future time horizons.

Table 4-3: Average Day Demands by Pressure Zone

ZONE	2023 (EXISTING CONDITIONS), L/S	2041 (FUTURE CONDITIONS), L/S	% GROWTH PER YEAR
Alice Lake	5.0	18.8	8.1%
Boulevard	1.7	3.6	4.7%
Brackendale	14.0	18.9	1.8%
Clarke	0.4	0.6	3.0%
Crumpit Woods	1.8	1.5	-0.8%
Dowad	1.8	3.7	4.2%
Garibaldi	6.5	8.9	1.9%
Hospital Hill	6.8	7.0	0.2%

ZONE	2023 (EXISTING CONDITIONS), L/S	2041 (FUTURE CONDITIONS), L/S	% GROWTH PER YEAR
Kintyre	1.1	2.2	3.9%
Quest	1.2	2.5	4.3%
Squamish River	95.9	152.5	2.8%
Stawamus	1.6	4.4	6.3%
Thunderbird	1.8	4.8	6.1%
University	6.6	11.5	3.3%
Westway	10.3	13.3	1.5%
TOTAL	156	254	2.9%

5 MODEL CALIBRATION

The utilization of water models has become integral for optimizing operations and planning expansions. However, the efficacy of these models hinges on their ability to accurately represent the dynamic hydraulic behavior of the actual infrastructure. To attain this precision, a calibration procedure is required to adjust the model's parameters to align with real-world data obtained from field hydrant tests. This process not only ensures a heightened level of accuracy but also instills confidence in the reliability of these models, validating their suitability for analyzing system demands such as ADD, MDD, and PHD conditions. Additionally, such a model can prove to be invaluable in anticipating system performance under stressful scenarios, such as during a fire flow event.

5.1 HYDRANT TEST PROGRAM

As part of the 2024 WMP update, WSP utilized a hydrant testing program to aid in the calibration and validation process. This program consists of two types of tests: C-factor tests, which measure the roughness coefficients in pipes of similar material and diameter, and multi-pressure hydrant tests, which are used in larger pressure zones to give an overview of headlosses and network connectivity within a specific neighbourhood section. To calibrate the water model, a total of eight C-factor tests and six sets of multi-pressure hydrant flows were carried out. The data collected from these field tests were then subsequently simulated in the model to compare the flow and pressure at various locations, thereby aligning the model with current conditions.

5.2 FIELD CALIBRATION RESULTS

To calibrate the hydraulic water model, the model scenarios were adjusted to match the best available data on PRV setpoints and water demands. The aim of the hydraulic water model calibration is to achieve a pressure difference of less than 10% between the simulated results and the field data, as per the AWWA standard ECAC 1999. Moreover, the acceptable deviation for flow rates (where measured) should be at most $\pm 10\%$ difference in pressure, $\pm 3\%$ of flows under ADD conditions, and $\pm 5\%$ under MDD and PHD conditions. Since hydrant tests were only conducted during the fall months in this testing program, WSP only compared them to ADD model scenarios.

The typical C-factor values from the previous 2016 Water Master Plan were further adjusted during the calibration as a result of the hydrant flow testing. The updated C-factors are summarized in Table 5-1.

Table 5-1: Model C-Factors

MATERIAL	1959-1979	1980-1990	1991-2000	2001-2024	> 300 MM
Asbestos Cement	100	110	-	120	+10
Ductile Iron	110	120	130	140	+10
HDPE	110	-	-	140	+10
PVC	110	120	130	140	+10
Steel	110	-	-	140	+10

The calibration results show a favourable correlation between the computer simulations and the field observations in the pressure zones with hydrant testing data. 90% of the static and residual pressures met the acceptable difference between calculated and measured results, with the remaining 10% attributed to data logger error. This calibration provides the assurance that the model has been adequately calibrated to meet the requirements of system modelling and analysis.

The hydrant testing configuration is included in Appendix E while the results of the hydrant testing, and calibrated values of the water model are summarized in Appendix F.

6 DESIGN CRITERIA

This section outlines the design criteria utilized for evaluating the system's minimum and maximum service pressures, maximum velocities, available fire flows, and storage volumes.

6.1 SERVICE PRESSURE DESIGN STANDARDS

Minimum and maximum service pressure standards are required to ensure that all properties receive drinking water within the District. Too low service pressures can result in an insufficient hydraulic grade for water to, for instance, run washing machines or exit faucets while too high service pressures can significantly increase pipe leaks and watermain breaks. Minimum service pressures are commonly reviewed during high-demand scenarios, namely under peak hour conditions and coincident to a fire flow event. Meanwhile, maximum service pressures are commonly reviewed during low-demand periods, such as average day demand conditions.

Table 6-1 summarizes the range of service pressures permitted within the District of Squamish's water network. These criteria are based on the District's Subdivision and Development Control Bylaw No. 2649, 2018. These are the same standards that are used to assess the adequacy of the District's water network in Section 7.

Table 6-1: Service Pressure Requirements

SCENARIO	TYPE	PRESSURE (PSI)	PRESSURE (KPA)
During Average Day Demand (ADD)	Maximum	123 psi	850 kPa
During Maximum Day Demand coincident with a Fire Flow (MDD + FF)	Minimum	22 psi	150 kPa
During Peak Hour Demand (PHD)	Minimum	44 psi	300 kPa

The current District bylaw states that, pending approval from the District official, the maximum permissible pressure can be raised to 1035 kPa (150 psi) for systems featuring multiple pressure zones. WSP suggests utilizing the 150 psi requirement for analysis purposes.

6.2 MAXIMUM VELOCITY

Per MMCD design guidelines, maximum velocities under fire flow conditions should be below 3.5 m/s to avoid excessive surge pressures. The fire flow analysis in this study was completed with unrestrained velocities, as in the previous iteration and per typical practice for master planning exercises; however, an additional scenario was run with a velocity constraint of 3.5 m/s for the District's reference (see Figure 7-10 in Section 7.4.4).

6.3 FIRE PROTECTION AND STORAGE

The fire flow requirements assigned to each junction were updated from those in the 2015 WMP water model. The general approach follows from the 2015 WMP but was updated to include current land uses and water demands. The District of Squamish's water network must be able to deliver large volumes of water for fire protection, in addition to normal demands. Fire protection considerations are:

- 1 That only one fire will be fought at a time;
- 2 A minimum residual pressure of 22 psi shall be maintained in each watermain, to ensure that pumper trucks obtain adequate water supplies; and,
- 3 Fire flows are tested coincident to maximum day demand.

The recommended minimum fire flow requirements were developed as per the criteria in the 2015 WMP. Both existing and future fire flow requirements are based on the 2022 MMCD Design Guideline Manual. Table 6-2 below are the minimum fire flow requirements used in the 2024 WMP update, broken down by development type.

Table 6-2: Minimum Fire Flow Requirements under Existing and Future Scenarios

TYPE	EXISTING SCENARIO (L/S)	FUTURE SCENARIOS (L/S)	REQUIRED DURATION OF FIRE FLOW (HR)
Single Family Residential	60	60	1.50
Multi-Family Residential	90	90	2.00
Institutional	150	150	2.00
Commercial	150	150	2.00
Industrial	225	225	3.00

6.4 SUPPLY STORAGE

Water storage reservoirs are strategically positioned at specific elevations to support pressure zones within the distribution system. These zones typically experience design pressures ranging from a minimum of 44 to 50 psi up to a maximum of 123 to 150 psi. During a fire event, minimum pressures are allowed to drop to 22 psi.

The calculation of the fire storage component is based on the suggested fire flow rates outlined in Table 6-2 multiplied by the fire flow durations in Table 6-3. It also considers the land use with the highest fire flow demand within the pressure zones served by each reservoir.

Table 6-3: Duration of Fire Flow per Fire Underwriters' Survey for Storage Capacity Assessment

FIRE FLOW RATE (L/S)	DURATION OF FIRE, FOR STORAGE CAPACITY (HOURS)
60	1.50
90	2.00
120	2.00
150	2.00
200	2.50
225	3.00
250	3.50

The primary purpose of water storage is to balance and optimize the supply and distribution of water. When appropriately sized, reservoirs retain water during periods of low demand and supplement the primary water source during high-demand periods, such as during peak hours. Typically, reservoirs are designed to replenish daily and possess sufficient storage capacity to meet the requirements for both balancing storage (equivalent to 25% of the maximum day demand) and fire storage, as determined by the recommended flow rates and durations specified in Table 6-3. Additionally, there is also a need for emergency storage. The volume requirements for storage are calculated using the following formula:

$$Volume = A + B + C$$

Where:

- A = Fire Storage (required extent and duration of fire flow as specified in the guidelines above)

- B = Equalization Storage (25% of Maximum Day Demand served by the Reservoir)
 - C = Emergency Storage (25% of the sum of A and B)
-

6.5 OTHER CRITERIA

Other criteria from the District’s bylaw which were used for this report include:

- Criteria 1.6.d – In residential areas, water mains servicing fire hydrants must be 150 mm in diameter or larger.
- Criteria 1.6.e – Water mains in commercial/industrial/institutional areas shall be designed to take into account anticipated demands and fire flows, and the minimum allowable size is 200 mm.

7 HYDRAULIC ANALYSIS

This section evaluates the hydraulic performance of the current water system infrastructure in the District, taking into account both the current (2023) conditions and anticipated (2041) future demands. The primary objective of this assessment is to determine the system’s effectiveness in meeting the standards outlined in Section 6. The results of this evaluation will identify shortcomings, enabling WSP to recommend appropriate enhancements for the water utility over the short, medium, and long term.

The analysis in this section includes an assessment of the existing storage and pumping capacities, as well as a review of the system pressures and fire flows within the distribution network.

7.1 SOURCE SUPPLY CAPACITY

The main source of water supply in the District of Squamish is the Powerhouse Springs well field. The untreated water undergoes a treatment process involving liquid sodium hypochlorite. The capacities of the current water sources are summarized in Table 7-1.

Table 7-1: Existing Source Capacities

WATER SOURCE	CURRENT CAPACITY (L/S)
Powerhouse Springs Well Site	255
Mashiter Creek	184
Stawamus River	132
TOTAL	571

As noted in Section 3.2, the Mashiter and Stawamus River surface water sources are not normally utilized except in emergency circumstances. Most notably, there are frequent turbidity events and low flow periods in these surface water sources during the peak summer demand periods, which limits the actual withdrawal rate from these sources.

This review illustrates that the current capacity of the Powerhouse Springs Well site (firm capacity = 275 L/s) is just sufficient to supply the existing MDD in the District of Squamish (245 L/s) but unable to supply the District’s future MDD (479 L/s). Increases to the supply capacity of the District’s water utility are required.

7.1.1 SOURCE SUPPLY RECOMMENDATIONS

As highlighted in the review of WSP’s Long-Term Source Development Strategy, which is detailed in Section 9.1, it is recommended that the District consider the installation of an additional well and a 70 HP pump at Powerhouse Springs Well Field in the near future and expand the abstraction limit at Powerhouse Springs. This expansion would allow for the installation of an additional high-capacity well by 2026 to meet the growing water demands in the District. These measures will enable Powerhouse Springs to meet existing and interim demands while the District evaluates the feasibility of developing an additional water source from the Stawamus River as a medium- to long-term supplementing supply option.

7.2 STORAGE RESERVOIRS

WSP has conducted an evaluation of the existing storage capacities of the District’s reservoirs to assess their suitability for current and future storage requirements. This evaluation encompasses the storage capacity

considerations for the years 2023 and 2041. The calculation of the necessary fire storage only considers the maximum fire demand within the service area and the analysis includes only those reservoirs owned by the District.

It should be noted that Plateau and Thunderbird Reservoirs were constructed by directly boring into rock, unlike typical construction methods of above-ground or below-ground storage tanks. This approach has been effective over most of these reservoir’s service lives to date. However, in recent years, the District has discovered a leak in the rock structure that makes up Plateau Reservoir. Due to significant water losses when Plateau Reservoir is filled above a certain level, the District never fills Plateau Reservoir beyond 70% of its stated capacity. The reduced capacity continues to be limiting during emergency scenarios, as the reservoir rapidly drains above 70% full. For the purpose of this analysis, WSP considers the storage capacity of Plateau Reservoir to be 3,178 m³ – 70% of the storage volume stated in the previous table. The Thunderbird Reservoir has not experienced any known leakage issues, however, due to its similar construction, the District is currently looking into a condition assessment program for both reservoirs.

7.2.1 EXISTING RESERVOIR STORAGE

Table 7-2 offers an overview of storage reservoir volumes, the pressure zones they support, and corresponding estimates of the maximum daily demand they accommodate in the water system.

Table 7-2: Existing Reservoir Contributions

RESERVOIRS	STORAGE VOLUME (ML)	ZONES SUPPLIED	2023 MDD (L/S)	2041 MDD (L/S)
Alice Lake	4.13	Alice Lake, Brackendale	31	78
Boulevard	1.08	Boulevard, Dowad ^a	6	15
Crumpit Woods	0.80	Crumpit Woods	3	4
Lower University 1	0.46	Stawamus, Westway, Hospital Hill, Clarke	28	52
Lower University 2	2.04			
Lower University 3	2.02			
Plateau	3.18	Squamish River	149	266
University	2.04	University, Quest	11	27
Thunderbird	1.62	Thunderbird, Garibaldi, Kintyre	17	37
TOTAL	17.4		245	479

a) Dowad Zone receives pumped water from the Skyridge Booster Pump Station sourced from Boulevard Reservoir.

Although reservoirs are engineered to fulfill the requirements of the pressure zone they serve, their volumes may cascade into lower pressure zones or be pumped to higher pressure zones to address storage volume shortages during periods of increased fire flow demand. Pressure zones lacking storage reservoirs rely on supply from neighboring zones to satisfy fire flow demands.

7.2.2 STORAGE CAPACITY ASSESSMENT

As outlined in Section 6.4, the design of the fire storage element adheres to the flow and duration recommendations of the FUS, as detailed in Table 6-2. The selection of land use for all reservoirs under review was determined by the

land use that necessitates the greatest fire flow within the pressure zones serviced by each respective reservoir. Specifically, in the Downtown Core of Squamish, where substantial multi-family developments are planned and have been built, the District has requested a fire flow requirement of 250 L/s for fire storage purposes.

Table 7-3 provides a comparison of the total storage needed and the currently available storage under both existing (2023) and anticipated (2041) future demand scenarios. Additionally, it highlights the adjustments in storage volume necessary to rectify any deficiencies in the storage capacity.

Table 7-3: Storage Capacity Analysis

RESERVOIR	A – FIRE STORAGE (ML)	B – EQUALIZATION STORAGE (ML)	C – EMERGENCY STORAGE (ML)	A + B + C REQUIRED STORAGE (ML)	AVAILABLE STORAGE (ML)	EXCESS (ML)	DEFICIENT?
EXISTING (2023)							
Alice Lake	1.08	0.66	0.44	2.18	4.13	1.95	No
Boulevard	1.08	0.14	0.30	1.52	1.08	-0.44	Yes
Crumpit	0.32	0.07	0.10	0.49	0.80	0.31	No
Lower University 1	2.43	0.60	0.76	3.79	0.46	-3.40	Yes
Plateau	2.43	3.22	1.41	7.06	3.18	-3.88	Yes
University	1.08	0.24	0.33	1.66	2.04	0.38	No
Thunderbird	1.08	0.36	0.36	1.80	1.62	-0.18	Yes
FUTURE (2041)							
Alice Lake	1.08	1.69	0.69	3.46	4.13	0.67	No
Boulevard	1.08	0.33	0.35	1.76	1.08	-0.69	Yes
Crumpit	0.32	0.08	0.10	0.51	0.80	0.29	No
Lower University 1, 2, 3	2.43	1.12	0.89	4.43	4.50	0.07	No
Plateau	2.43	5.74	2.04	10.21	3.18	-5.67	Yes
University	1.08	0.59	0.42	2.09	2.04	-0.05	Yes
Thunderbird	1.08	0.80	0.47	2.35	1.62	-0.73	Yes

The analysis above indicates that under the 2023 scenario, there are insufficiencies in storage volumes within the pressure zones supplied by Boulevard, Lower University, Plateau, and Thunderbird Reservoirs. Looking ahead to the 2041 scenario, storage volume deficiencies are projected in the pressure zones served by Boulevard, Plateau, University, and Thunderbird Reservoir.

Below are listed the remaining storage deficiencies, accounting for cascading from adjacent zones, and the corresponding recommended improvements in storage volume as suggested by WSP:

- There is a storage deficiency at Boulevard Reservoir of 0.44 ML under existing conditions and 0.69 ML under future conditions. The two new Lower University Reservoirs currently under construction will be able to cascade water through PRVs to address this deficient fire flow volume.
- There is a storage deficiency at Lower University Reservoir of 3.40 ML under existing conditions. The two new Lower University Reservoirs currently under construction will resolve this deficiency once built.
- There is a storage deficiency at Plateau Reservoir of 3.88 ML under existing conditions and 5.67 ML under future conditions. The existing demand for Plateau can be met by cascading water from the existing Lower University Reservoir, the two new Lower University Reservoirs, and Alice Lake Reservoir. Should Plateau’s leakage issue be remedied (i.e. back to full capacity), the 2041 demand for Plateau can also be met by cascading water from the same sources stated above. A condition assessment of Plateau Reservoir is suggested to identify potential corrective actions for addressing its leakage problems.
- There is a future storage deficiency at University Reservoir of 0.05 ML under future conditions. Water cannot be cascaded from higher pressure zones to address this deficiency. Given that this deficiency is relatively minor and due to growth, there are no specific upgrades proposed at this time. Instead, WSP suggests reviewing this deficiency and addressing it during the next iteration of the Water Master Plan.
- There is a storage deficiency at Thunderbird Reservoir of 0.18 ML under existing conditions and 0.73 ML under future conditions. Water cannot be cascaded from higher pressure zones to address this deficiency.
- Construction of a new reservoir (0.73 ML) to service the Thunderbird or the Garibaldi pressure zone is suggested.

The upgrade/construction of new reservoirs is necessary to remediate storage shortfalls in future scenario analyses. These reservoirs are primarily necessitated by growth and should be partially financed through Developer Cost Charges (DCCs).

7.2.3 STORAGE RESERVOIR RECOMMENDATIONS

As outlined in Section 7.2, the District has recently identified a substantial leakage problem with Plateau Reservoir when its water level exceeds 70% capacity. As a result, it is recommended to conduct a physical inspection of the reservoir, ideally during winter or nighttime low-flow conditions. Remediation efforts may involve relining the reservoir and sealing any existing cracks. Given its similar construction methodology, the District is also looking into conducting a physical inspection of the Thunderbird Reservoir.

The construction of a new 0.73 ML reservoir in the Thunderbird Zone could be prioritized around 2041 as the upsize required is due to future growth. The District has the option to finance this new reservoir through developer cost charges.

Considerations which should be taken to determine the optimal location of reservoir storage in the distribution system may include:

- Proximity to roads and powerlines, and existing residents
- Property ownership
- Availability of space for future expansion
- Appropriate topography for construction
- Maintaining/Providing pressures and fire flows
- Influence on system hydraulics
- Seismic Considerations

7.3 PUMPING CAPACITY ANALYSIS

This section evaluates the current capabilities of the District’s pump stations to determine if they can meet the maximum daily demands of each pressure zone within the District under both present (2023) and future (2041) scenarios. The analysis only includes pump stations owned by the District.

7.3.1 EXISTING PUMP CAPACITY

The estimation of design flows for all pumps was derived from the modelled pump curves. The design capacity of a pump station is calculated as the total design flow of all pumps minus the largest pump. This section evaluates the current capabilities of the District’s pump stations to determine if they can meet the maximum daily demands of each pressure zone within the District under both present (2023) and future (2041) scenarios. The analysis only includes pump stations owned by the District.

Table 7-4 provides a summary of the design capacity for each of the District’s pump stations.

Table 7-4: Existing Pump Capacities

PUMP STATION	RATED CAPACITY	RESERVOIR	DESIGN CAPACITY (L/S)
Boulevard	Pumps: 2 x 40 L/s @ 147 m (each)	Boulevard	40
Crumpit Woods	Pumps: 2 x 5.1 L/s @ 67 m (each)	Curtis	5.1
University Booster	Pumps: 3 x 21 L/s @ 111 m (each)	University	42
Skyridge Booster	Pumps: 2 x 2 L/s @ 22 m (each)	Alice Lake	119.6
	Pumps: 2 x 5.8 L/s @ 30 m (each)		
	Pumps: 2 x 104 L/s @ 50 m (fire)		

The assessment of pump stations is based on their ability to meet the maximum daily demand of the areas they serve. Since each pumped area has storage reservoirs, the peak hour demand is met through the excess reservoir storage capacity and is not required as part of the pump capacities.

7.3.2 PUMP CAPACITY ASSESSMENT

Table 7-5 outlines the service areas associated with each pump station and compares the required pump capacity to the available pump capacity under existing and future demand conditions.

Table 7-5: Pump Capacity Analysis

PUMP STATION	SERVICE AREA	REQUIRED CAPACITY (L/S)	MODELED CAPACITY (L/S)	EXCESS (L/S)	DEFICIENT?
EXISTING (2023)					
Boulevard	Thunderbird, Garibaldi, Kintyre	18.2	40	21.8	No
Crumpit Woods	Crumpit Woods	3.5	5.1	1.6	No
University Booster	University, Quest	12.4	42	29.6	No

PUMP STATION	SERVICE AREA	REQUIRED CAPACITY (L/S)	MODELED CAPACITY (L/S)	EXCESS (L/S)	DEFICIENT?
Skyridge Booster	Dowad	5.6	119.6	114.0	No
FUTURE (2041)					
Boulevard	Thunderbird, Garibaldi, Kintyre	37.6	40	2.5	No
Crumpit Woods	Crumpit Woods	3.7	5.1	1.4	No
University Booster	University, Quest	27.5	42	14.5	No
Skyridge Booster	Dowad	9.4	119.6	110.2	No

The analysis demonstrates that there are no inadequacies in pumping capacity within the water utility under existing (2023) and future (2041) scenarios. As such, no upgrades to the pump stations are suggested for the District under this Water Master Plan.

7.4 DISTRIBUTION SYSTEM ANALYSIS

This section assesses the effectiveness of the District’s water distribution mains in maintaining adequate service pressures and fire flows throughout the entire water distribution system, under both current and future demand scenarios.

7.4.1 AVERAGE DAY DEMAND

Within each zone, the property located at the lowest elevation encounters the greatest pressure relative to the hydraulic grade line (HGL) established by a reservoir, PRV, or pump. Table 7-6 provides a summary of node counts within different pressure zones where pressures exceed 150 psi under both existing and future ADD conditions.

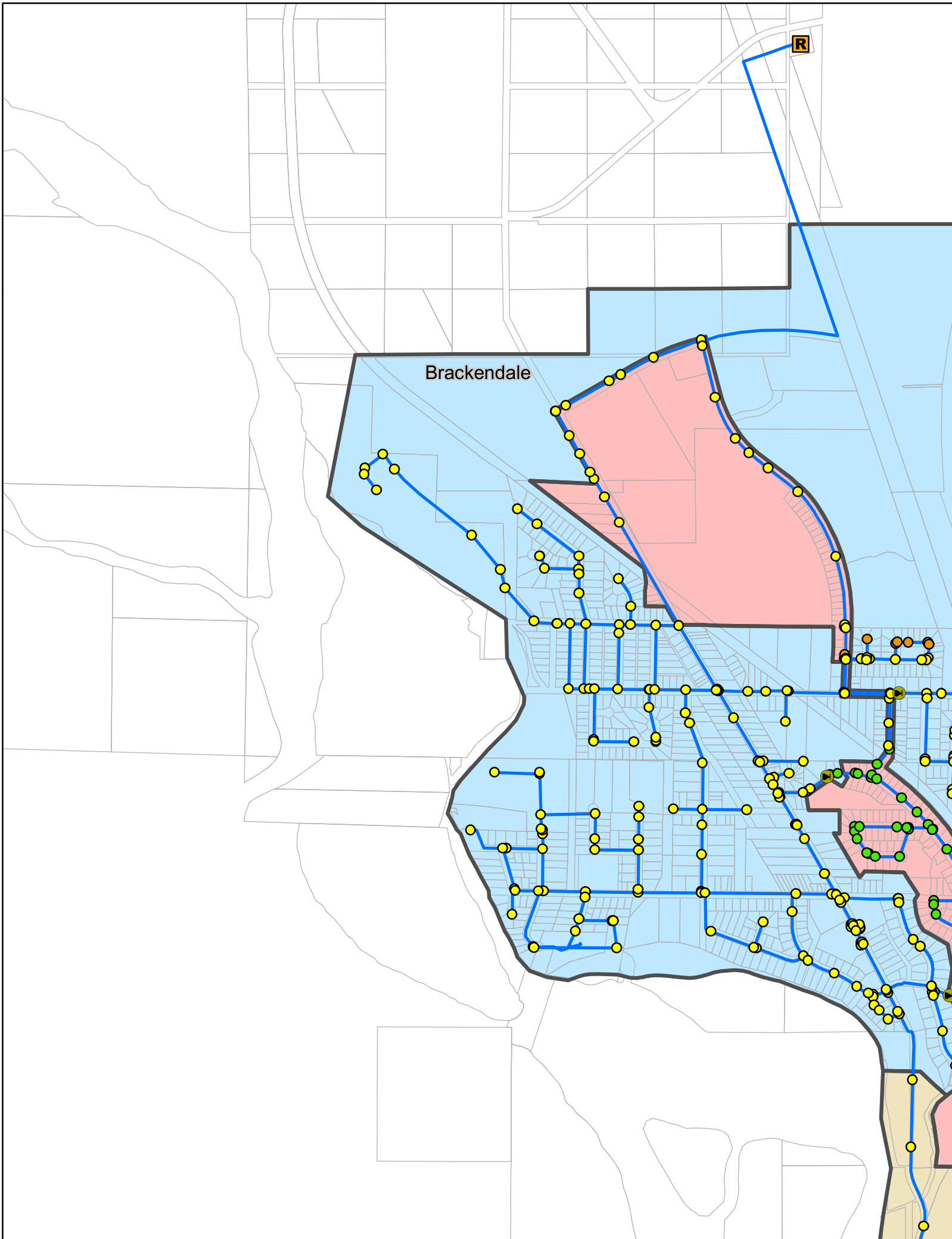
Table 7-6: Pressures during ADD before Capital Improvements

ZONE	# NODES ABOVE THE MAXIMUM ALLOWABLE PRESSURE	
	EXISTING (2023)	FUTURE (2041)
Alice Lake	84	4
Dowad	2	0
Kintyre	1	1
Thunderbird	7	7
University	28	27
TOTAL	122	39

In both 2023 and 2041 scenarios, Alice Lake, Kintyre, Thunderbird and University pressure zones surpassed the maximum allowable pressure limits. The remaining pressure zones maintained compliance with the maximum allowable pressure thresholds only in the 2041 scenario.

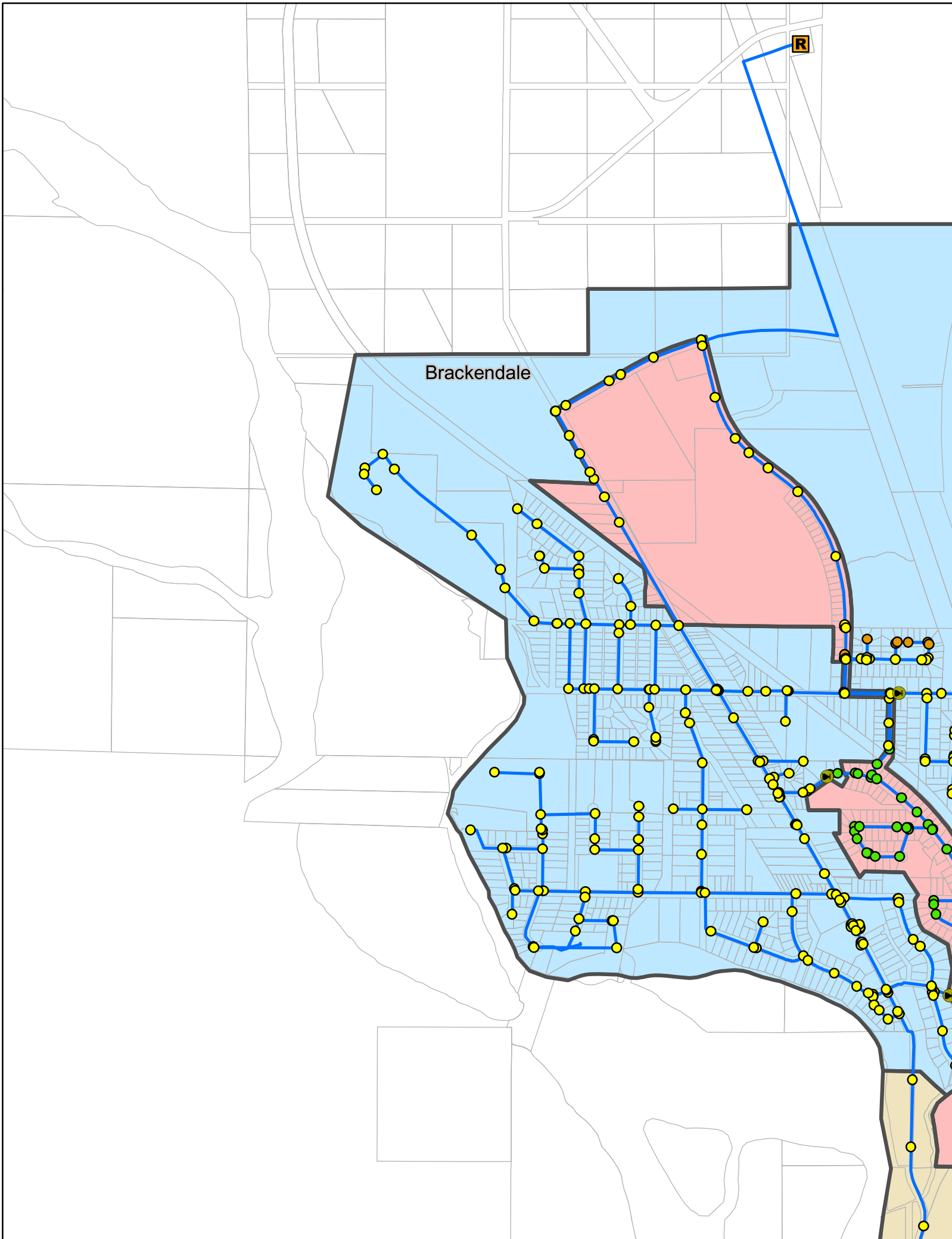
In the 2023 scenario, 122 out of the total 2,215 nodes (accounting for 5.5%) experience pressures exceeding 150 psi. This situation is anticipated to persist in the 2041 scenario, where 1.8% of demand nodes are expected to fall short of the required pressure levels. As depicted in Figure 7-1 and Figure 7-2, several areas (i.e. Thunderbird and

University Zones) within the District exhibit pressures exceeding 150 psi, both under current circumstances and projected future scenarios. This is due to these nodes being located near pump stations.



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7.4.2 PEAK HOUR DEMAND

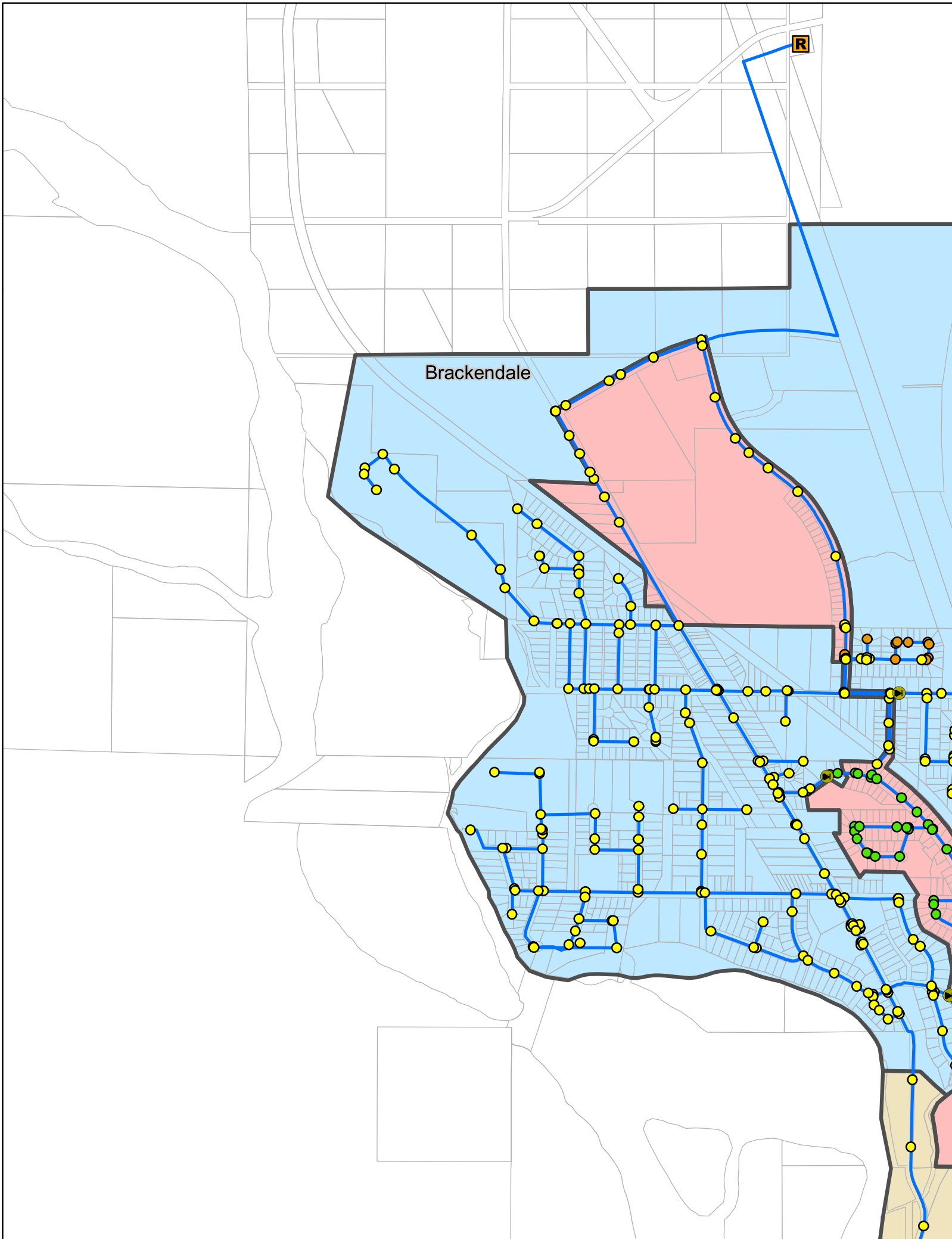
The lowest pressures in each zone are found at the location with the highest elevation relative to the Hydraulic Grade Line (HGL) of the zone, determined by a Reservoir, Pressure Reducing Valve (PRV), or Pump. Table 7-7 provides an overview of the nodes with pressures currently below 44 psi.

Table 7-7: Pressures during Peak Hour Demand before Capital Improvements

# NODES BELOW THE MINIMUM ALLOWABLE PRESSURE		
ZONE	EXISTING (2023)	FUTURE (2041)
Boulevard	25	25
Crumpit Woods	6	10
Hospital Hill	1	4
Squamish River	12	15
Stawamus	8	27
Thunderbird	2	2
TOTAL	54	83

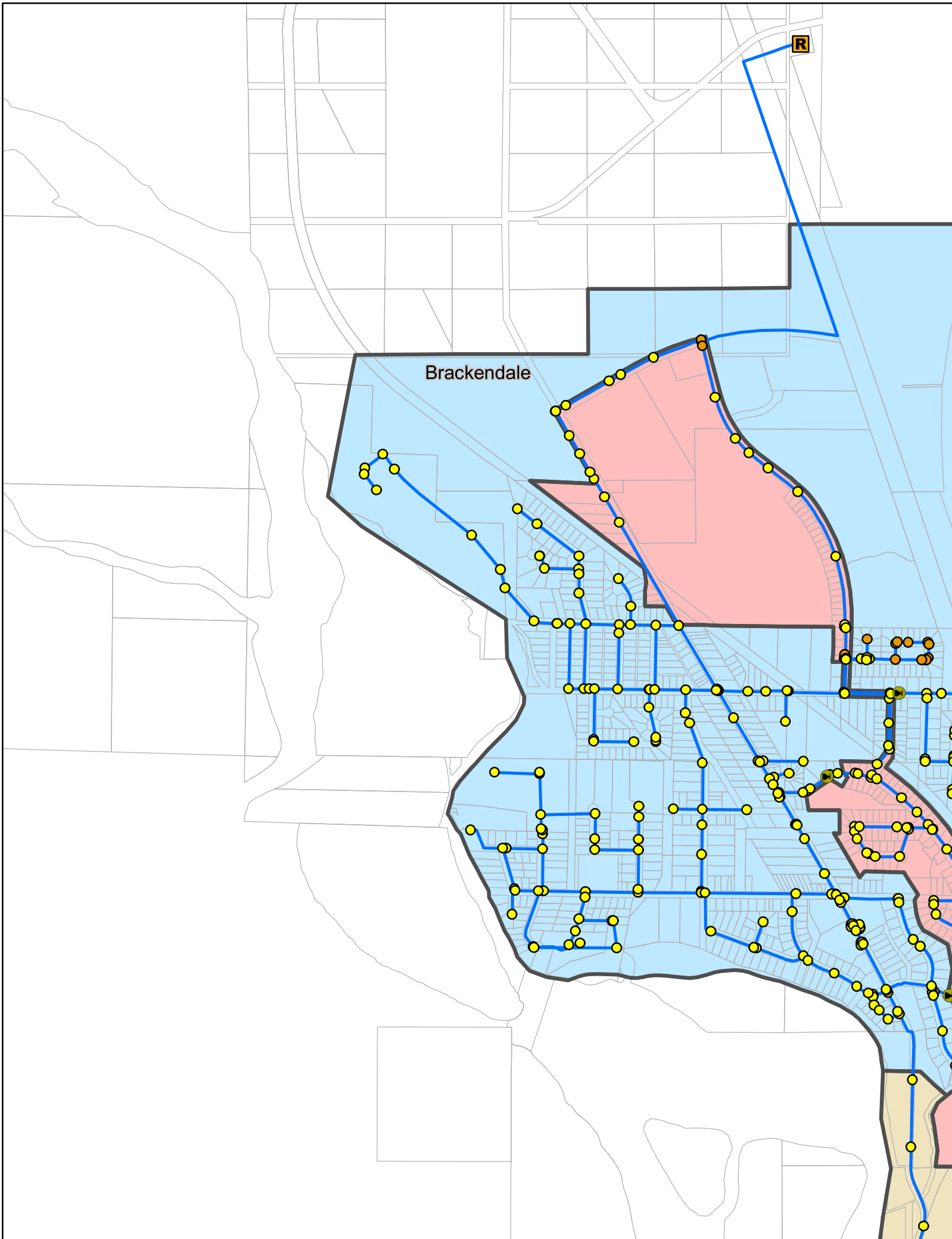
Pressure levels fall below the specified minimum requirements in Boulevard, Crumpit Woods, Hospital Hill, Squamish River, Stawamus, and Thunderbird pressure zones for both current and future scenarios. Current conditions (2023) are satisfactory, with only 54 out of 2,215 nodes (2.4%) experiencing pressures below 44 psi. This trend continues into the future scenario, with 83 nodes (3.7%) being deficient.

Figure 7-3 and Figure 7-4 depicts the areas within the District of Squamish where pressures are below 44 psi under both current and future conditions.



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7.4.3 FIRE FLOW ANALYSIS

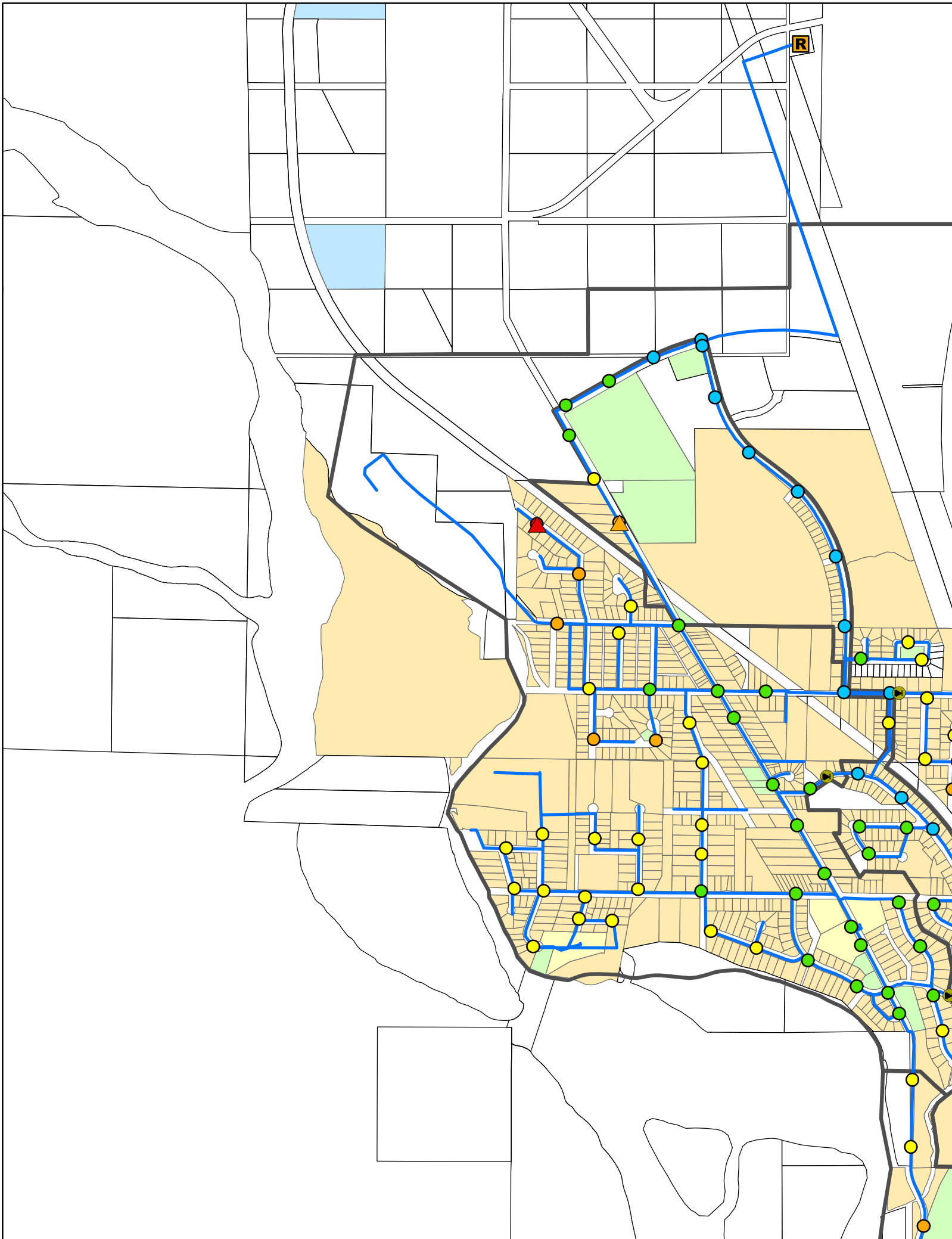
The results of the fire flow analysis are depicted in Figure 7-5 and Figure 7-6, illustrating varied fire flow requirements and availabilities throughout the system and identifying deficient areas. The analysis excludes fire flows at dead ends without hydrants.

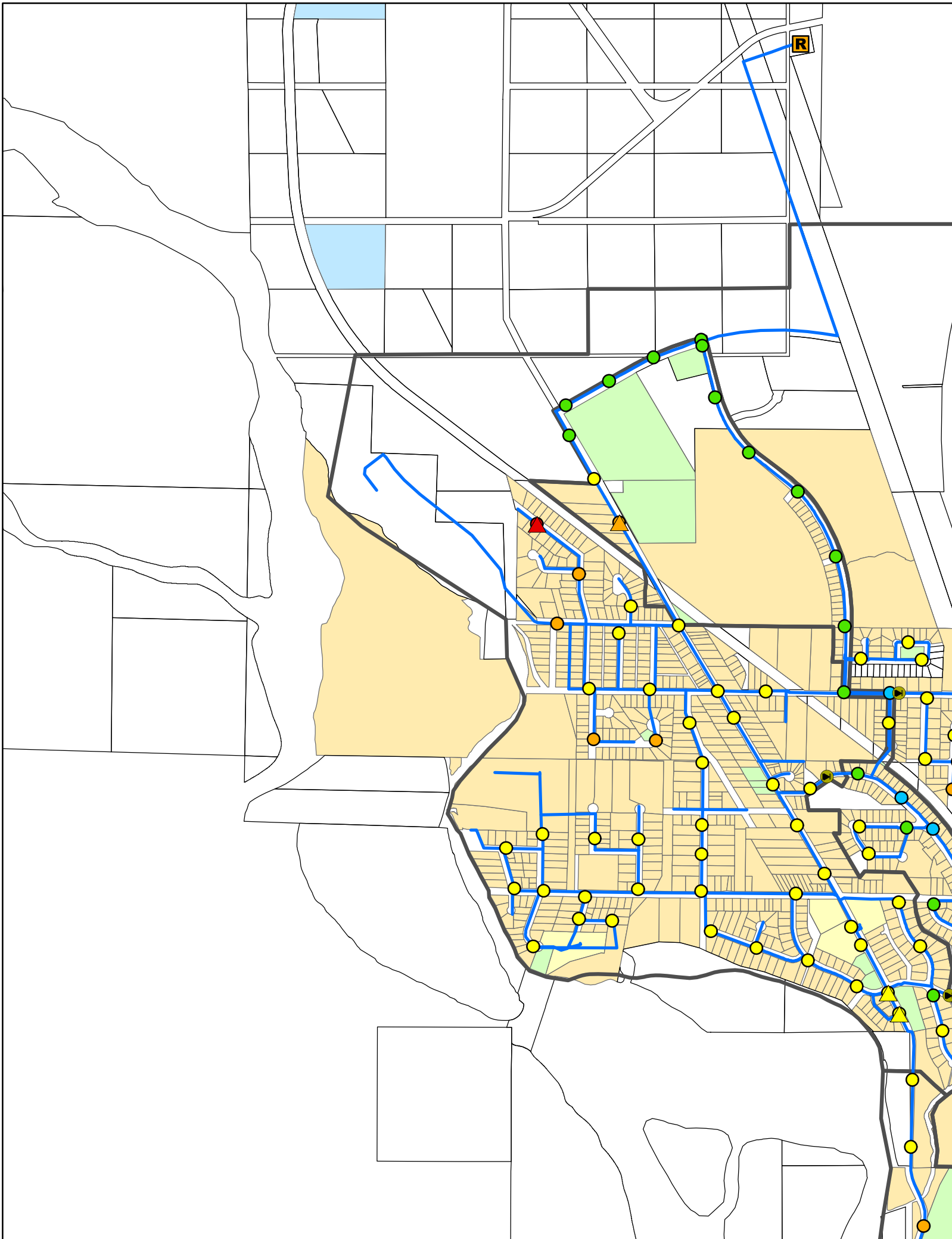
In both 2023 and 2041 scenarios, fire flows were evaluated against the historical MMCD design criteria requirements. The findings of the fire flow analysis during maximum day demand are detailed by pressure zone in Table 7-8.

Table 7-8: Number of Deficient Fire Flows Coincident to Maximum Day Demand

ZONE	# NODES WITH LESS THAN THE REQUIRED FIRE FLOW (UNCONSTRAINED VELOCITY)	
	EXISTING (2023)	FUTURE (2041)
Alice Lake	1	1
Boulevard	1	1
Brackendale	1	3
Clarke	0	2
Crumpit Woods	6	11
Dowad	0	0
Garibaldi	1	1
Hospital Hill	1	4
Kintyre	0	0
Quest	0	0
Squamish River	19	22
Stawamus	0	10
Thunderbird	1	1
University	0	0
Westway	1	1
TOTAL	32	57

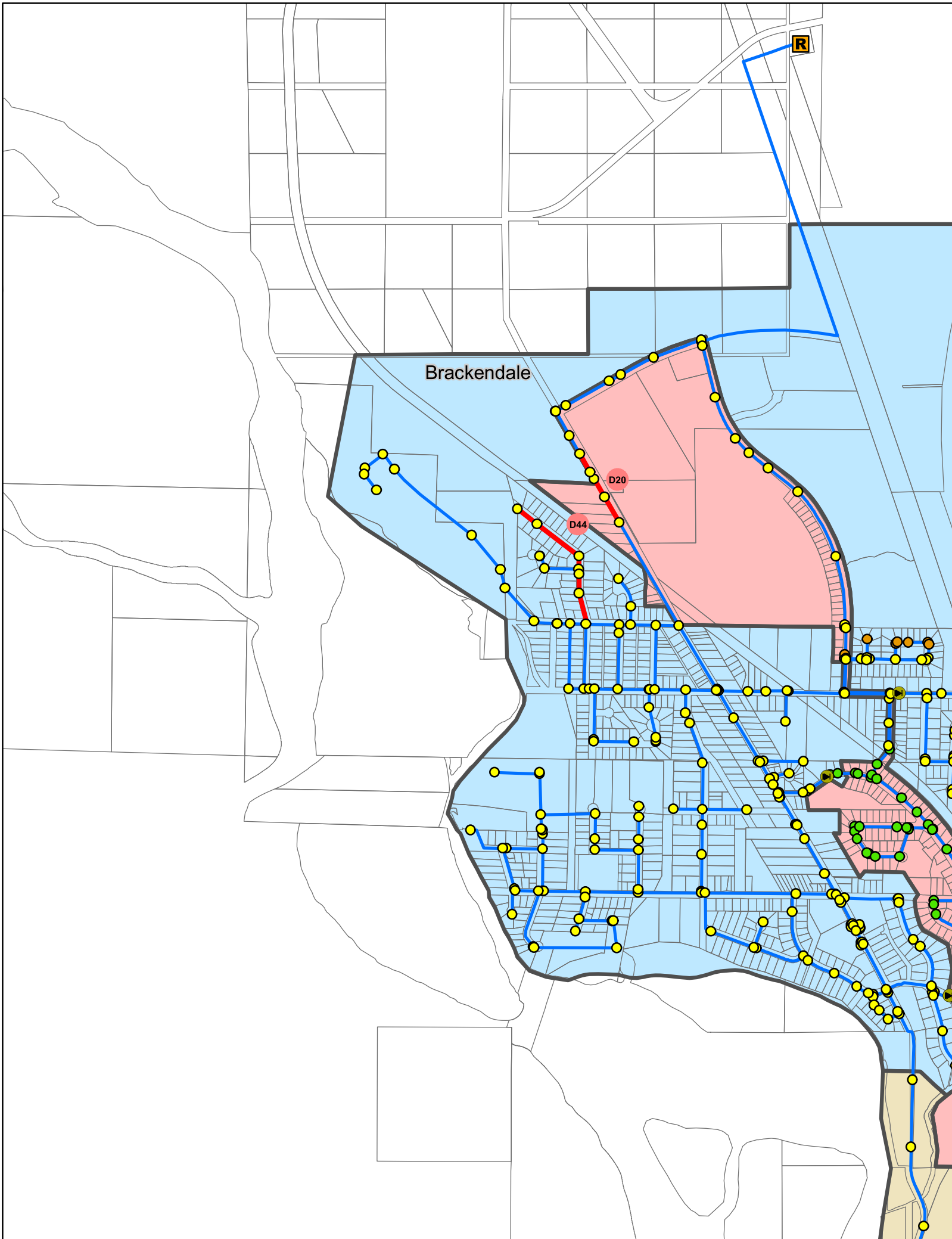
Under current 2023 conditions, there are several instances of inadequate fire flow, with deficiencies identified in 32 out of 651 demand nodes with fire hydrants. This accounts for approximately 4.9% of the District’s total water system. This issue worsens in the 2041 scenario, with deficiencies affecting 8.8% of nodes. The cause of this deterioration is driven chiefly by the increased demand under future conditions.





7.4.4 DISTRIBUTION SYSTEM RECOMMENDATIONS

The recommendations included in the Capital Projects list addressing the level of service deficiencies covered in Section 7.4 pertain solely to the primary distribution system. Enhancements for fire flow provision to dead ends should be handled individually, particularly since there may be forthcoming opportunities for mandatory watermain upgrades to be funded by developers seeking to tie into the current water system. Figure 7-7, Figure 7-8, and Figure 7-9 provide a summary of the proposed upgrade measures aimed at addressing current and future deficiencies within the distribution system. Refer to Table 8-2 in Section 8.2 for a tabulated list of the proposed upgrades along with the associated cost.

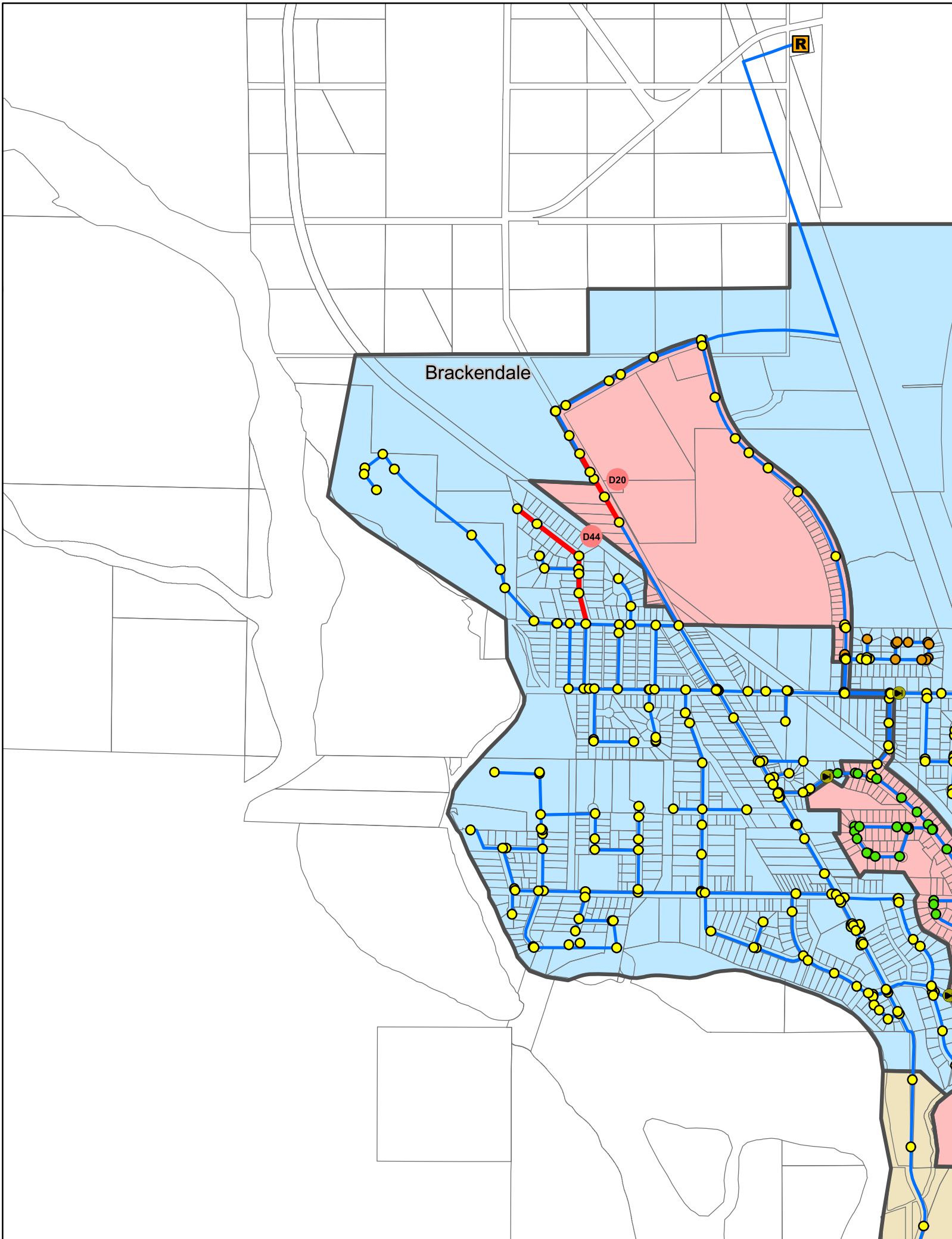


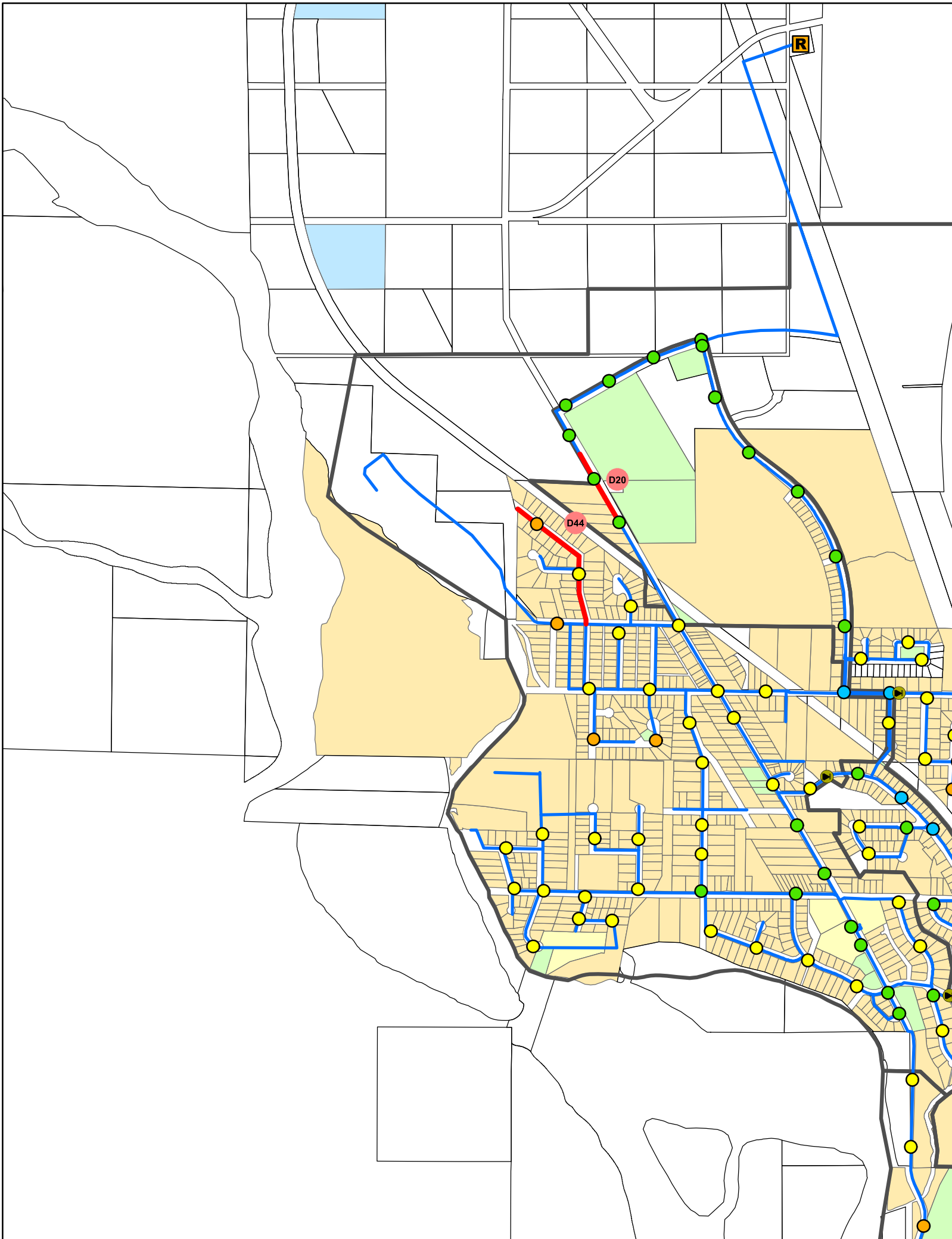
Brackendale

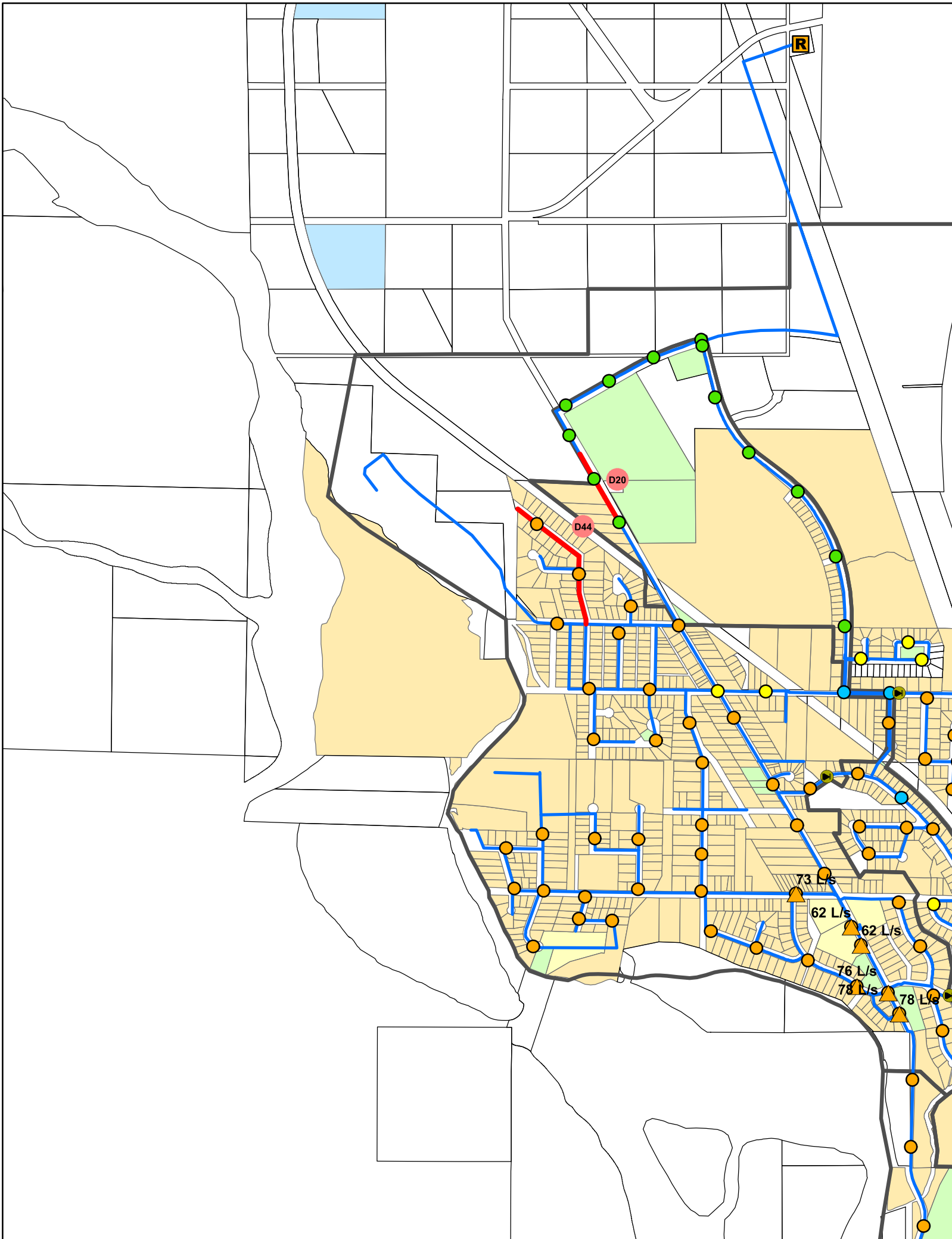
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D20

D44







7.5 BILL 44 IMPACT ASSESSMENT

In November 2023, the Province of British Columbia introduced housing legislation to allow increased density in areas currently zoned for single-family or duplex use through Bill 44. The new legislation requires all local municipalities to update their zoning bylaws to permit one secondary suite or laneway home in all single-family residential zones. In addition, zoning bylaws must be updated by June 30th, 2024, to permit small-scale, multi-unit housing such as triplexes and townhomes in municipalities over 5,000 people and within urban containment boundaries. Lots smaller than 280 square meters will be allowed three units, and larger lots will be allowed four. Six units will be permitted on lots with a prescribed distance to transit stops with frequent service and that are larger than 280 square meters.

This section assesses the impacts of Bill 44 on the District's water distribution system (i.e. new areas of fire flow deficiency) as well as on major facilities (i.e. sizing impacts on pump stations and reservoirs to meet higher fire flow requirements, as applicable).

7.5.1 PRELIMINARY REVIEW

A preliminary review of the District's GIS parcel data was completed and discussed with the District prior to this assessment of Bill 44 impacts on the water distribution system. The review revealed that there are only four (4) single-family lots within the District that are smaller than 280 square meters. There are also no frequent transit service areas within the District. Therefore, the majority of the District's single-family lots would be able to build up to four multi-family units.

It is expected that the ultimate buildout population of the District will increase, however, the rate of uptake and final build-out is difficult to determine at this time. The District is working on population growth forecasts; however, this will not be available in the near term to WSP. It was noted that for the water system, increased fire flow requirements will have a significant impact on levels of service, likely outstripping the impacts of population increases on a parcel-by-parcel basis. For the purposes of the Bill 44 impact assessment, the fire-flow requirement for these new multi-family parcels is assumed to be increased to 90 L/s, up from the previous requirement of 60 L/s for single-family areas.

The District is concerned with ultimate pipe sizing requirements in the distribution networks, and unnecessary interventions before existing pipes reach the end of their service lives. Furthermore, the District indicated there is a mechanism for developers to pay for upgrades should a developer want to develop an area in the near term, while planned capital upgrades by the District are slated for a later date. Generally, water infrastructure upgrades to meet growth-related servicing needs are funded by developers.

WSP completed an initial assessment of available fire flows under existing and future conditions, noting that based on the most up-to-date draft capital works plan, there are only a few areas with less than 90 L/s available under future buildout conditions. Sections 7.5.2, 7.5.3, and 7.5.4 provide further detail on the impacts of Bill 44 on the District's water distribution system, including the performance and recommendations of the District's water storage reservoirs, pumping capacity, and distribution system in light of the changes under Bill 44.

7.5.2 STORAGE RESERVOIR ANALYSIS

Section 7.2.1 presents the evaluation of the existing storage of the District's reservoirs to assess their suitability for current and future storage requirements. As mentioned in this section, the evaluation encompasses the storage capacity considerations for the years 2023 and 2041. The calculation of the necessary fire storage only considers the maximum fire demand within the service area and the analysis includes only those reservoirs owned by the District.

As mentioned in Section 7.5.1, the District is working on population growth forecasts. Given timing constraints, it was agreed with the District that the additional analysis would focus on increased fire flow requirements only. Once

the District has finalized its population projections later this year/next year, WSP can complete further, more comprehensive analysis at that time and issue an addendum to the WMP.

The assessment of Bill 44 impacts on the water distribution system assumes that the population and its associated daily water demands remain consistent with those outlined in this WMP. Given this assumption, no modifications are required for the storage reservoir analysis as presented in Section 7.2.1 concerning the Bill 44 impact assessment.

7.5.3 STORAGE CAPACITY ANALYSIS

Supplementary to the storage capacity analysis presented in Section 7.2.2, a sensitivity analysis was completed to determine the increased storage capacity requirements with respect to the increased fire-flow requirements concerning the Bill 44 impact assessment. For the purposes of the Bill 44 impact assessment, the fire-flow requirement for the new multi-family parcels is assumed to be increased to 90 L/s, up from the previous requirement of 60 L/s for single-family areas.

Table 7-9 provides a comparison of the total storage needed and the current available storage under the anticipated (2041) future demand scenario as presented in Section 7.2.2 and under the Bill 44 increased fire-flow requirements scenario.

Table 7-9: Storage Capacity Analysis Under Higher Fire-flow Requirements Triggered By Bill 44

RESERVOIR	A – FIRE STORAGE (ML)	B – EQUALIZATION STORAGE (ML)	C – EMERGENCY STORAGE (ML)	A + B + C REQUIRED STORAGE (ML)	AVAILABLE STORAGE (ML)	EXCESS (ML)	DEFICIENT?
FUTURE (2041)							
Alice Lake	1.08	1.69	0.69	3.46	4.13	0.67	No
Boulevard	1.08	0.33	0.35	1.76	1.08	-0.69	Yes
Crumpit	0.32	0.08	0.10	0.51	0.80	0.29	No
Lower University 1, 2, 3	2.43	1.12	0.89	4.43	4.50	0.07	No
Plateau	2.43	5.74	2.04	10.21	3.18	-5.67	Yes
University	1.08	0.59	0.42	2.09	2.04	-0.05	Yes
Thunderbird	1.08	0.80	0.47	2.35	1.62	-0.73	Yes
FUTURE (2041) – Bill 44 Impact Assessment							
Alice Lake	1.08	1.69	0.69	3.46	4.13	0.67	No
Boulevard	1.08	0.33	0.35	1.76	1.08	-0.68	Yes
Crumpit	0.65	0.08	0.10	0.91	0.80	-0.11	Yes
Lower University 1, 2, 3	2.43	1.12	0.89	4.43	4.50	0.07	No
Plateau	2.43	5.74	2.04	10.21	3.18	-5.67	Yes
University	1.08	0.59	0.42	2.09	2.04	-0.05	Yes
Thunderbird	1.08	0.80	0.47	2.35	1.62	-0.73	Yes

The analysis above indicates that under the Bill 44 Impact Assessment scenario, there is one new deficiency in storage volume located at Crumpit Reservoir. Under the Bill 44 Impact Assessment, Crumpit Reservoir is identified to have a storage deficiency of 0.11 ML. Given that this deficiency is relatively minor and due to the increased fire-flow requirement, there is no specific upgrades proposed at this time. Instead, WSP suggests reviewing this deficiency and addressing it during the next iteration of the Water Master Plan.

7.5.4 PUMPING CAPACITY ANALYSIS

As mentioned in Section 7.5.1, the District is working on population growth forecasts. Given timing constraints, it was agreed with the District that the additional analysis would focus on increased fire flow requirements only. Once the District has finalized its population projections later this year/next year, WSP can complete further, more comprehensive analysis at that time and issue an addendum to the WMP.

The assessment of Bill 44 impacts on the water distribution system assumes that the population and its associated daily water demands remain consistent with those outlined in this WMP. Given this assumption, no modifications are required for the pumping capacity analysis as presented in Section 7.3 concerning the Bill 44 impact assessment.

7.5.5 FIRE FLOW ANALYSIS

A new scenario was developed in the 2024 WMP model titled “2041 MDD+FF UG + Bill 44 UG” to reflect the higher fire-flow requirement for existing single-family areas that are considered multi-family under the Bill 44 impact assessment. As mentioned in Section 7.5.1, the fire-flow requirement for these new multi-family parcels is assumed to be increased to 90 L/s, up from the previous requirement of 60 L/s for single-family areas. This section assesses the impacts of this higher fire-flow requirement on the District’s water distribution mains and their ability to maintain adequate fire flows throughout the entire water distribution system, under the future maximum day demand scenario.

The results of the fire flow analysis are depicted in Figure 7-11 and Figure 7-12, illustrating varied fire flow requirements and availabilities throughout the system and identifying deficient areas. The analysis excludes fire flows at dead ends without hydrants.

The fire flows were evaluated against the historical MMCD design criteria requirements. The findings of the fire flow analysis during maximum day demand are detailed by pressure zone in Table 7-10.

Table 7-10: Number of Deficient Fire Flows Coincident to Maximum Day Demand Under Higher Fire-flow Requirements Triggered By Bill 44

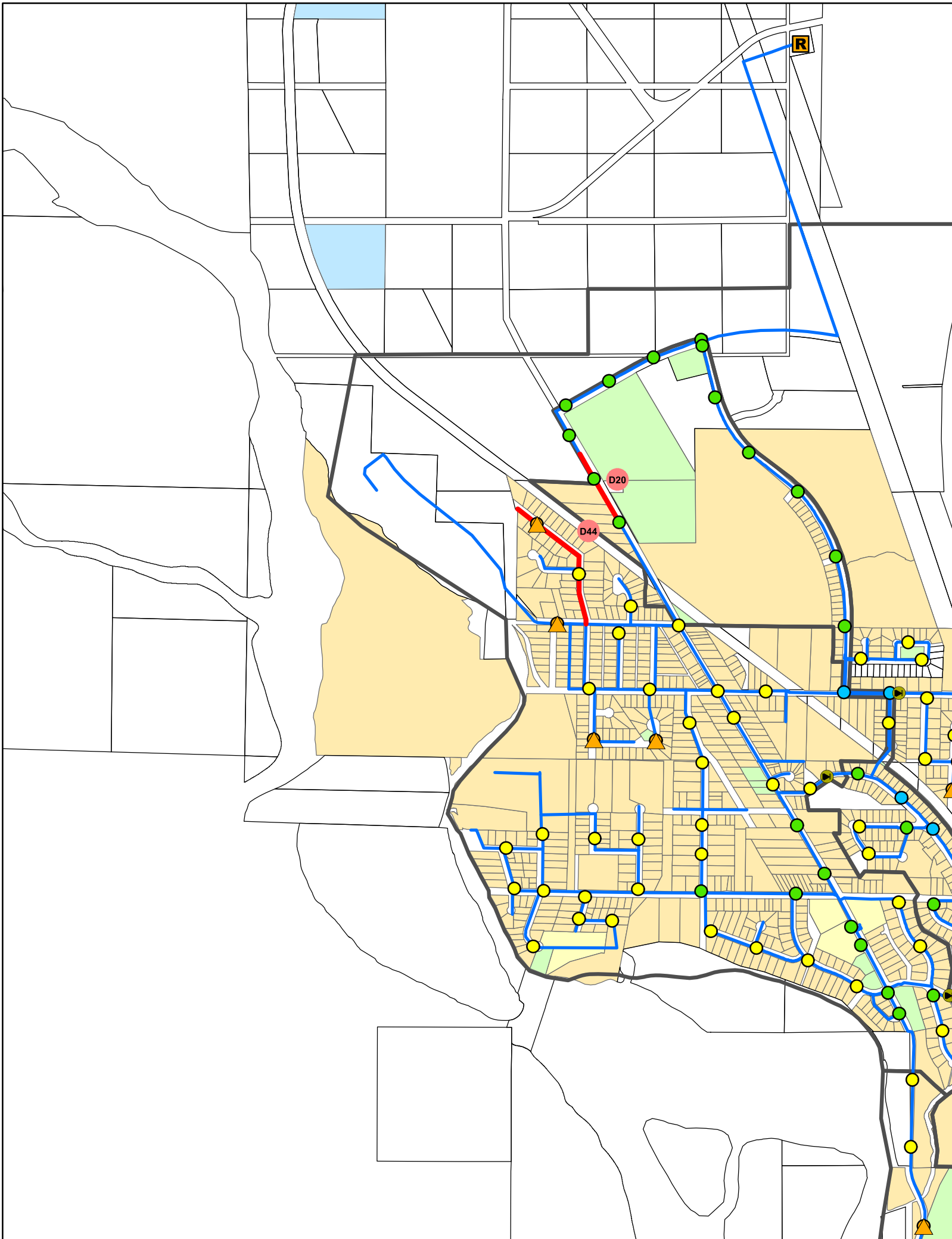
ZONE	# NODES WITH LESS THAN THE REQUIRED FIRE FLOW	
	FUTURE (2041) WITH UPGRADES	FUTURE (2041) WITH INCREASED FIRE-FLOW REQUIREMENTS UNDER BILL 44
Alice Lake	0	0
Boulevard	0	7
Brackendale	0	8
Clarke	0	2
Crumpit Woods	1	13
Dowad	0	0
Garibaldi	0	2
Hospital Hill	0	0
Kintyre	0	0

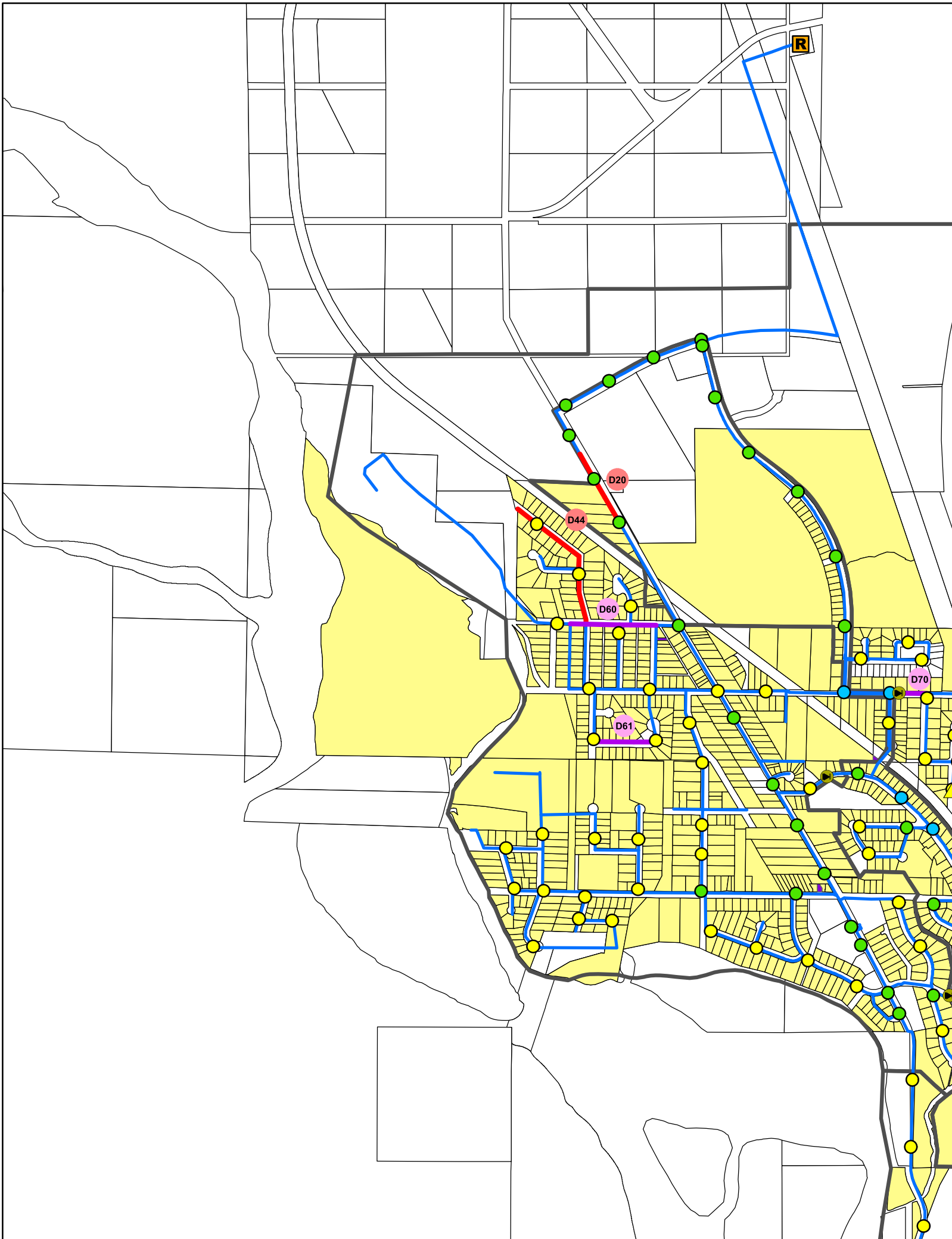
NODES WITH LESS THAN THE REQUIRED FIRE FLOW

ZONE	FUTURE (2041) WITH UPGRADES	FUTURE (2041) WITH INCREASED FIRE-FLOW REQUIREMENTS UNDER BILL 44
Quest	0	0
Squamish River	4	3
Stawamus	0	3
Thunderbird	0	3
University	0	0
Westway	0	0
TOTAL	5	41

Under future 2041 conditions (with capital planning upgrades prior to Bill 44 impacts), there are two locations remaining with fire-flow deficiencies. These deficiencies are located within the Crumpit Woods and Squamish River pressure zones. However, all two locations are only minimally deficient by less than 2% and are considered acceptable with no further solutions required.

The impacts of the increased fire-flow requirements under the Bill 44 assessment introduce 41 additional deficiencies located in the Boulevard, Brackendale, Clarke, Crumpit Woods, Garibaldi, Squamish River, Stawamus, and Thunderbird pressure zones. Figure 7-11 illustrates the location of these additional deficiencies. These 41 additional deficiencies are addressed through proposed solutions triggered under the Bill 44 Impact Assessment as presented in Figure 7-12 and Table 8-2.





7.5.6 BILL 44 DRIVEN DISTRIBUTION SYSTEM RECOMMENDATIONS

The recommendations outlined in this section pertain solely to the primary distribution system. Enhancements for fire flow provision to dead ends should be handled individually, particularly since there may be forthcoming opportunities for mandatory watermain upgrades to be funded by developers seeking to tie into the current water system. Prior to any upgrades related to Bill 44, it is also recommended to review alternative servicing approaches such as a detailed Fire Underwriters Survey analysis to determine if a proposed multi-family development can be serviced by existing available fire flows. Considering this and other servicing strategies could provide more cost-effective and efficient solutions, ensuring that new developments meet all the necessary safety and regulatory requirements.

Overall, the upgrades associated with Bill 44, as detailed in Table 8-2 of Section 8.2, consist exclusively of pipe upgrades spanning over 1.7 kilometres and costing approximately \$2.9 million.

8 SYSTEM IMPROVEMENTS

This section provides the District of Squamish with a Capital Projects List which summarizes the required water infrastructure-related system improvements over the next 17 years (from 2024 to the end of the study period in 2041). Projects from Section 7 and water infrastructure-related recommendations arising from desktop reviews in Section 9 have been prioritized. The highest priority projects focus on addressing multiple system deficiencies with a single project. For example, watermain upgrades address fire flow deficiencies and replace old AC watermains, and reservoir construction projects which provide improvements to existing storage but also address growth.

The comprehensive desktop reviews completed in Section 9 include a Long-Term Source Development strategy, a Water Conservation Plan, and an AC Watermain Renewal Program, which recommend numerous capital improvement projects and operational programs for the District going forward. Recommendations include:

- A new groundwater well is to be installed at the Powerhouse Springs well source.
- Operational programs to promote water conservation in the District.
- An AC watermain replacement program with prioritized replacements for each year spanning from 2025 to 2041.

8.1 COST ESTIMATE BASIS

The cost estimates listed in the Capital Projects List were calculated using unit cost rates from relevant previous projects within the District of Squamish and WSP’s cost database. These rates were adjusted to reflect 2024 dollars (see Table 8-1).

Table 8-1: Summary of Unit Rates used for Capital Improvement Plan

ASSET	PIPE DIAMETER (MM)	UNIT COST (\$)	UNIT
Watermain	150	1,540	Linear Meter
	200	1,670	Linear Meter
	250	1,970	Linear Meter
	300	2,000	Linear Meter
	350	2,140	Linear Meter
	400	2,580	Linear Meter
	450	2,630	Linear Meter
	500	2,680	Linear Meter
Reservoirs	-	1,400	Cubic Meter
Open/Close Valve	-	6,000	Each
PRV Setting Adjustments	-	6,000	Each
New PRV	-	400,000	Each

The unit rates above include an allowance of 15% for engineering fees and 15% for contingency. Since many of the capital improvement projects recommended are driven by densification, the District may be able to use development cost charges or grant funding to offset some of the costs in the capital plan.

8.2 CAPITAL PROJECTS LISTS

The proposed Capital Projects List is structured into the following categories:

- Capital Projects from the 2024 WMP
- Bill 44 Capital Projects from the 2024 WMP
- Capital Projects from the District’s previous Capital Projects List
- Recommendations from the Long-Term Source Development Strategy
- Recommendations from the AC Watermain Renewal Program
- Recommendations from the Water Conservation Plan

District staff should note that when utilizing costs from the Capital Projects List these cost estimates are based on an ENR Construction Cost Index (CCI) of 13,515 for January 2024 and should be adjusted to account for increased costs through a review of the updated CCI at the time of tender and construction.

The ENR indexes measure how much it costs to purchase a package of goods compared to what it was in the base year. For the District of Squamish, WSP recommends using the ENR’s Construction Cost Index (CCI) as this index is typically used to estimate costs for jobs where labor costs are a high proportion of total costs. Comparatively, ENR’s Building Cost Index (BCI) provides estimates that are more applicable for structures (i.e. commercial buildings and private dwellings). The District should note that the ENR costs merely offer a snapshot of general cost trends but are applicable for the purposes of helping District staff estimate project costs as they occur in the future.

The Capital Projects List is summarized in Table 8-2.

Table 8-2: Capital Projects List

Description	Pipe Length (m)	Original Diameter (mm)	Upgrade Diameter (mm)	Volume (m ³)	Other Costs (\$)	Unit Cost (\$/linear m)	# of Defs Fixed	Year
Water Master Plan 2023 - Capital Projects List								
D20 - Upgrade 240 metres of 150mm watermain to 250mm watermain on Government Road from approximately 150 metres south of Ross Road (addresses FFs) (AC Replacement) (formerly D20)	240	150	250			1,970	1	2025 -
WMP D26 - Upgrade 255 metres of 200mm watermain to 250mm watermain on Government Road from Garibaldi Way to Chief View Road (addresses FFs) (AC Replacement)	255	200	250			1,970	2	2030 -
WMP D27 - Upgrade 55 metres of 150mm watermain to 250mm watermain on Government Road from Garibaldi Way to Chief View Road (addresses FFs) (AC Replacement)	55	150	250			1,970	1	2030 -
D11 - Upgrade 355 metres of 150mm watermain to 250mm watermain on Government Road towards Squamish River (addresses FFs) (AC Replacement) (formerly D11)	355	150	250			1,970	1	2030 -
WMP D33 - Upgrade 925 metres of 200mm watermain to 250mm watermain on Mid Way and Progress Way (addresses FFs)	571	200	250			1,970	5	2035 -
D34 - Upgrade 210 metres of 150mm watermain to 200mm watermain on McNamee Place (addresses FFs) (AC Replacement) (see 1018 McNamee Place Water and Sanitary Servicing Review)	210	150	200			1,670	1	2030 -
WMP D38 - Upgrade 155 metres of 150mm watermain to 200mm watermain north of the intersection of Cleveland Avenue and Loggers Lane (addresses FFs)	155	150	200			1,670	1	2035 -
WMP D39 - Upgrade 155 metres of 150mm watermain to 300mm watermain north of the intersection of Westway Avenue and Maple Drive (addresses FFs)	155	150	300			2,000	1	2030 -
D16 - Upgrade 253 metres of 150mm watermain to 250mm watermain on Highway 99 from Clarke Drive to North that services industrial areas west of the Highway (addresses FFs) (formerly D16)	253	150	250			1,970	1	2035 -
WMP D42 - Upgrade 155 metres of 150mm watermain to 250mm watermain on Second Avenue from Vancouver Street to Westminster Street (addresses FFs) (AC replacement)	155	150	250			1,970	1	2025 -
D44 - Upgrade 445 metres of 150mm watermain to 200mm watermain along Birken Road from Axen Road to end (addresses FFs) (AC replacement)	445	150	200			1,670	2	2025 -
WMP D48 - Upgrade 105 metres of 150mm watermain to 200mm watermain along Perth Drive from north of Torbet Place to Pia Road (addresses FFs)	105	150	200			1,670	1	2025 -
WMP D51 - Upgrade 225 metres of 150mm watermain to 200mm watermain along Clarke Drive from Clarke Drive and Guilford to north (addresses FFs) (AC replacement)	330	150	200			1,670	5	2025 -
WMP D52 - Install new 300mm of watermain from end of Plateau Drive to Vista Crescent and Northridge Drive to have an additional connection from higher pressure Stawamus to lower pressure Stawamus (addresses FFs)	250	-	300			2,000	11	2025 -
WMP D53 - Upgrade 195 metres of 150mm watermain to 250mm watermain along Vista Crescent from Northridge Drive to Smoke Bluff Boulevard (addresses low pressures and FFs) (AC replacement)	195	150	250			1,970	4	2025 -
WMP D54 - Upgrade Maple 150mm Fire PRV to 300mm and upgrade 20 metres of 200mm watermain to 300mm watermain at the PRV location northwest of Maple Drive. Replace the Maple 75mm Domestic PRV with the existing 150mm Fire PRV (addresses FFs)	20	200	300		New PRV	2,000	1	2025 -
WMP D57 - Upgrade 145 metres of 150mm watermain to 200 mm watermain along View Place from Vista Crescent (AC replacement)	145	150	200			1,670	1	2035 -
WMP D58 - Upgrade Hospital Hill PRV from 200mm to 300mm and upgrade 10 metres of 250mm watermain to 300mm watermain	10	250	300		New PRV	2,000	2	2025 -

Table 8-2: Capital Projects List

Description	Pipe Length (m)	Original Diameter (mm)	Upgrade Diameter (mm)	Other Costs (\$)	Volume (m ³)	Unit Cost (\$/linear m)	# of Defs Fixed	Year
V1 - Raise Perth Domestic and Fire PRV settings from 73 psi and 69 psi to 85 psi and 81 psi, respectively (addresses existing deficiencies)				PRV Adj.			1	2025 -
V2 - Lower Crumplit Woods Fire PRV setting from 60 psi to 38 psi (addresses existing deficiencies)				PRV Adj.			7	2025 -
V3 - Raise Westway Fire PRV setting from 51 psi to 57 psi (addresses existing deficiencies)				PRV Adj.				2025 -
V4 - Raise Powerhouse Fire PRV setting from 28 psi to 33.7 psi (addresses existing deficiencies)				PRV Adj.				2025 -
V5 - Raise Thunderbird Domestic and Fire PRV settings from 70 psi and 60 psi to 85 psi and 81 psi, respectively (addresses existing deficiencies)				PRV Adj.			1	2025 -
V6 - Open 300 mm watermain along Kintyre Drive southeast of The Boulevard and Perth Drive to have an additional connection from Lower University Reservoir to Boulevard Pressure Zone, and close the 300mm watermain east of the Kintyre Drive and The Boulevard intersection to increase pressures in Boulevard Zone under PHD (addresses low pressures). Ensure Boulevard pump station draws water from Boulevard reservoir, to cycle this reservoir.				Valve Adj.			25	2025 -
V7 - Reduce Tantalus PRV from setting from 71 psi to 66 psi (addresses existing deficiencies)				PRV Adj.			4	2025 -
WMP R3 - Community Water Supply Trunk Main Desktop Study & Inspection								2025 -
WMP D59 - Install 739 metres of 450 mm watermain from Powerhouse Springs Well Field to Lower University Zone (decommission existing watermain with two Marnquam River crossings)	739	-	450			2,630	-	
Subtotal								

Bill 44 Upgrades

D60 - Upgrade 258 metres of 150mm watermain to 200 mm watermain along Axen Road from Government Road to Birken Road (addresses FFs)	258	150	200			1,670	4	
D61 - Upgrade 190 metres of 100 mm watermain to 150 mm watermain along Bracken Park Way and complete looping from Bracken Park Way to End	190	100	150			1,540	2	
D62 - Upgrade 105 metres of 150 mm watermain to 200 mm watermain along Thunderbird Ridge from Thunderbird Ridge to west	105	150	200			1,670	1	
D63 - Upgrade 85 metres of 150 mm watermain to 200 mm watermain along Tobermory Way from Thunderbird Ridge to Tobermory Way	85	150	200			1,670	2	
D64 - Upgrade 120 metres of 150 mm watermain to 200 mm watermain along Kintyre Drive from The Boulevard to Jura Crescent	120	150	200			1,670	2	
D65 - Upgrade 75 metres of 150 mm watermain to 200 mm watermain along Lanark Place from Friedel Crescent	75	150	200			1,670	1	
D66 - Upgrade 166 metres of 150 mm watermain to 200 mm watermain along Lanark Place to Ayr Drive	165	150	200			1,670	4	
D67 - Upgrade 150 metres of 150 mm watermain to 200 mm watermain along Ayr Drive from Friedel Crescent	150	150	200			1,670	1	
D68 - Upgrade 105 metres of 150 mm watermain to 200 mm watermain along Smoke Bluff Road from Vista Crescent to Panaroma Place	105	150	200			1,670	2	

Table 8-2: Capital Projects List

Description	Pipe Length (m)	Original Diameter (mm)	Upgrade Diameter (mm)	Other Costs (\$)	Volume (m ³)	Unit Cost (\$/linear m)	# of Defs Fixed	Year
From Unfinished Previous Capital Projects List (2015)								
Replace Lomond PRV (See AMP 5-Year Plan for details)								2030 -
Replace Depot PRV (See AMP 5-Year Plan for details)								2030 -
Replace Perth PRV (See AMP 5-Year Plan for details)								2035 -
R1 - Construct a 0.73 ML Reservoir for Thunderbird Zone (see above)					730	1400		2035 -
R3 - Condition Assessment of Thunderbird and Plateau Reservoirs								2025 -
Water Master Planning Studies / Water Conservation Studies / Asset Management Plan (see above)								2029, 2030
Subtotal								
From Long Term Source Development Strategy								
Near Term - New Well at Powerhouse Springs Well Field								2025 -
Assessment of Powerhouse Springs' long-term available capacity and permitting constraints								2025 -
Risk Assessment of Water Transmission Supply Lines from Powerhouse Springs								2025 -
Medium Term - Develop Stawamus River and Mashiter Creek Surface Water Sources (see above)								2030 -
Subtotal								
From AC Watermain Renewal Program								
AC Watermain Renewal Program (refer to AC Watermain Renewal Plan Report)								2024 -
Subtotal								
From Water Conservation Plan								
Development Bylaw Revision and Data Analysis								2024 -
Outdoor Water Use Bylaw Revision								2025 -
Subtotal								
Total								

8.3 FINANCIAL MODEL

The District's Water Master Plan has been instrumental in creating a Utility Financial Model. This model is designed to evaluate the utility's financial viability in the long run and to estimate the necessary rate hikes for the utility's consumers until 2041.

The Capital Projects List includes projects that have been incorporated into the financial model. This integration has provided valuable insights to the project team and the District about the practicality of the Capital Upgrades program. It has helped determine the rate increments needed to fund the capital program and the costs of infrastructure renewal for the District in the future.

The financial model yields a sustainable financial strategy that ensures complete cost recovery for service provision, while taking into account the principles of customer fairness, water preservation, and the District's water system management ideals.

8.3.1 WATER RATE INCREASES

Recommendations for annual water rate increases to be implemented in the District are outlined in Water & Sewer Utilities Rate Study, located in Appendix D.

9 ANCILLARY STUDIES

Alongside the 2024 Water Master Plan, WSP has created a range of Technical Memoranda and Reports for the District. These have been incorporated into Appendix A, B, and C.

9.1 LONG-TERM SOURCE DEVELOPMENT STRATEGY

The Long Term Source Development Review aimed to evaluate how the District’s water system can cater to future demands, specifically by the end of the Water Master Plan study period in 2041. Water supply source expansion options previously considered by the District were updated and assessed. This involved updating and analyzing Class D cost estimates and conducting life-cycle cost analyses, including a detailed review of infrastructure-related requirements (such as pumping and storage requirements) that would enable the successful implementation of each strategy. The supply options reviewed included:

- Additional wells at Powerhouse Springs (Aquifer 397)
- A new well field along the Lower Mamquam Aquifer (Aquifer 398)
- Upgrade of the Stawamus and/or Mashiter surface water sources

The costs for each option are summarized in Table 9-1.

Table 9-1: Summary of Costs for Long-Term Source Development Strategies

OPTION	DESCRIPTION	COST
Powerhouse Springs Well Field		
	Capital Cost	\$1,041,480
	Annual O&M	\$288,175
	17-Year Life-Cycle Cost (7% Discount Rate)	\$4,407,431
Lower Mamquam Aquifer Well Field		
	Capital Cost	\$13,044,428
	Annual O&M	\$378,900
	17-Year Life-Cycle Cost (7% Discount Rate)	\$17,472,308
Stawamus River Surface Water Treatment		
	Capital Cost	\$2,073,720
	Annual O&M	\$319,658
	17-Year Life-Cycle Cost (7% Discount Rate)	\$5,809,875

9.1.1 SUMMARY AND RECOMMENDATIONS

In the near term, Powerhouse Springs Well Field will necessitate the installation of an additional well and a 70 HP pump to address immediate peak consumption demands, as the current supply is nearly at the District’s 2023 MDD.

Furthermore, the District will also need to apply for new MOE permits to increase the abstraction rates for Powerhouse Springs to meet growing water demands. These measures will enable Powerhouse Springs to meet existing and interim demands while the District evaluates its long-term options.

In the interim, the District should conduct a comprehensive study to determine the potential capacity of Powerhouse Springs as a long-term source, its impacts on Powerhouse Creek, and any permitting constraints. Based on the study's results, the District may want to consider further mid-term expansion at Powerhouse Springs, such as additional wells/pumps.

It is also recommended that the District undertake feasibility studies for using Stawamus River as an emergency source. These studies should assess the river's flow availability, nearby fishery flow requirements, and the seismic resiliency of the area before installing treatment facilities at Stawamus. This can be part of a wider Stawamus Watershed Protection Plan. Should the District decide to develop Stawamus River into a secondary source, it will offer the District greater water security and system resiliency for the long term.

The Long Term Source Development Review Technical Memorandum can be found in Appendix A and describes the evaluation and cost analyses for these strategies.

9.2 WATER CONSERVATION PLAN

Historically, the District of Squamish has enjoyed a plentiful supply of fresh water, with its drinking water system reliably fulfilling the needs of the community without substantial conservation efforts. Recently, however, the scenario has evolved due to rapid population growth, aging water infrastructure, climate change, and economic pressures. These changes require a delicate balance between expanding the system and managing costs effectively.

The 2024 update builds on the District's water conservation experience to set out a course of action for the next 17 years that will allow the District's water utility to influence system demands in order to meet a water conservation goal. It tackles a historical trend of an estimated 67% increase in average day demand (ADD) for multi-family residences from 2015 to 2024, which now represents 33% of the District's 2023 ADD. The plan also addresses the continued high water usage from single-family homes and institutional, commercial and industrial properties.

With multi-family residential growth and long-term climate change-induced supply risks, the plan focuses on the importance of water efficiency to prevent costly infrastructure investments and promote long-term water reliability. It aims to optimize aquifer use and avert expensive treatment upgrades. An attainable target of a 20% reduction in per capita water demand (ADD and MDD) by 2041 was selected.

Key strategies in the updated plan include enhanced metering systems, modernized leak detection techniques, bylaw revisions, infrastructure improvements, and the implementation of conservation-focused rate structures. Collectively, these initiatives demonstrate a strong commitment to the long-term sustainability and efficient management of the District's water resources.

9.2.1 SUMMARY AND RECOMMENDATIONS

Refer to Table 9-2 for a summary of the budget allocations and a brief outline of the preliminary scope for the implementation of the proposed initiatives. These initiatives will establish the groundwork for the District to achieve its water conservation goal. The rationale behind their choice is documented in the Water Conservative Plan Report provided in Appendix B.

Table 9-2: Water Conservation Plan Schedule and Budget

WATER CONSERVATION PROGRAM	ESTIMATED BUDGET (2024-2041)	DETAILS
Revisiting Development Bylaws for Metering Expansion	Bylaw Revision: \$20,000 Operations: \$25,000/year	A new program aimed to mandate meter installation for new developments and the redevelopment of existing single- and multi-family properties, expanding on the current requirement for new developments to include meter chambers. Includes costs for amending development bylaws, data integration systems, and staff training.
Leak Detection and Infrastructure Modernization	\$43.6 million from 2024-2040 + staff training and additional leak detection equipment	Replacement of 26 km of existing water mains and investment in modern leak detection technologies and staff training for proactive leak detection and repair programs.
Outdoor Water Use Bylaw Revision and Enforcement	Bylaw Revision: \$20,000 Enforcement: \$25,000/year	Costs associated with legal consultation for outdoor water use bylaw revisions, public notification processes, and additional staffing to promote water-saving practices for enforcement.
Conservation-Focused Water Rate Structure	Currently in Development	Development and implementation of a new single- or multi-step rate structure, primarily requiring administrative efforts.
Public Education and Engagement	\$25,000/year	Regular budget for communication materials, community events, digital outreach, and partnership programs.
Sustainable Practices and Incentives	\$50,000/year	Development of guidelines and incentives for xeriscaping, including public workshops and promotional materials.
Strategic Partnerships and Programs	\$100,000/year	Establishing partnerships, targeted metering programs, and support for water reclamation projects in high-usage sectors.

9.3 AC WATERMAIN RENEWAL PROGRAM

The District’s AC watermain replacement strategy identifies priority watermain assets which must be replaced expediently, as well as opportunities for deferrals. WSP identifies these opportunities by conducting a thorough risk assessment of the District’s AC watermain inventory. This includes updating the probability of failure analysis with recent replacements and current system pressures.

The report (refer to Appendix C) presents the updated AC Watermain Renewal Plan of the 2041 planning horizon and includes a financial analysis to quantify the cost implications of AC watermain replacements on the water utility. The associated investment in the network supports maintaining current levels of service as AC watermain deteriorate over time. The report also updates the spending backlog forecasted and presents a defensible methodology for watermain replacement deferrals where possible, based on the current state of infrastructure and local tolerances for the consequence of failure.

By deferring low-risk AC watermain renewals by 15 years (start replacement by 2041), the total cost for replacing high-risk and medium-risk AC watermain is \$43.9 million over the next 15 years (2025-2040), replacing 26 km of watermain. The previous plan projected \$22.5 million over 16 years (2014 – 2030), replacing 60.2 km of

watermain. The cost increase between the two plans is primarily due to the large increase in construction costs since the previous plan was prepared.

After 2041, replacing low-risk and the remaining medium-risk pipes will incur an additional cost of \$23.3 million. This replacement is anticipated to span 9 years, from 2041 to 2049, with an estimated annual cost of approximately \$2.6 million.

9.3.1 SUMMARY AND RECOMMENDATIONS

The risk-based AC watermain renewal plan prioritizes the replacement of high-risk watermains at the end of their expected service life of 60 years. Medium-risk watermain replacements have been deferred by 5 years (to a service life of 65 years) and low-risk watermain replacements have been deferred by 10 years (to a service life of 70 years).

This risk-based approach to AC watermain renewals allows for deferring low-risk watermains, prioritizing more critical mains, and allowing the District to finance other vital infrastructure projects (e.g. capital upgrades and supply upgrades, as detailed in the 2024 WMP Update). However, it should be noted that as the District's AC watermain infrastructure ages, a significant portion of the low-risk watermains will be coming up for replacement in the 2040 to 2060 time horizon. It is recommended that the AC Renewal Program and the overall Capital Projects list from the WMP be reviewed and updated regularly at a minimum 5-year interval to review and reprioritize infrastructure spending needs.

The priority high-risk and medium-risk AC renewals have been incorporated into the Capital Projects List of the 2024 WMP Update.

9.4 FUTURE PROJECTS

Some projects which may be considered following the completion of this Water Master Plan are detailed below.

9.4.1 WATER SUPPLY TRUNK MAIN

The condition and seismic resiliency of the Community Water Supply Trunk Main have recently been a matter of concern. This watermain, which is over four decades old, has not undergone any upgrades during its operational years and is responsible for delivering an estimated 80% of the District's water supply, catering to all residents north of the Mamquam River.

Given the trunk main's crucial role in the District's water infrastructure, WSP recommends a phased approach to conducting a desktop seismic study and a condition assessment of the watermain, including its above-ground portions through the Smoke Bluffs and marine crossing of the Upper Mamquam Blind Channel.

The proposed desktop study should encompass the local surficial geology and offer high-level insights into potential geotechnical and seismic risks. Generally, the available record drawings indicate the pipeline was built to contemporaneous design standards, therefore a structural/civil desktop review against current seismic code would likely yield recommendations for seismic upgrades (e.g. hold-down anchors, thrust blocks, pipe restraints or expansion joints, etc.), or full-on replacement with a seismic resilient design where retrofits are impractical or cost-prohibitive on a crucial active supply main.

Portions of the pipeline are above ground, and a visual inspection is possible via a walkthrough of the alignment to confirm record drawing details and provide high-level visual condition inspection. It is suggested a walkthrough be completed before any further in-depth testing (such as acoustic monitoring) as the 45-year-old pipeline is well within the typical useful life for a ductile iron pipe, and based on our understanding the concern with the trunk main is less about its current condition as it is the potential performance under a seismic event. If deemed warranted, visually inspecting the buried sections would be a more involved process and require hydrovacating (or hand digging where hydrovac trucks can't access the trunk main). Inspection of the marine crossing to confirm condition and settlement would be difficult and require extensive planning and risk mitigation to complete a diving inspection; an inline condition assessment could instead be completed with multi-sensor probes that would also map vertical (and

horizontal) positioning to confirm settlement to date. The inline investigation would require fitting the existing pipeline with launch/retrieval ports on either side of the marine crossing (this is typically done at hydrants, but custom riggings can be developed where hydrants are unavailable, at greater effort/planning for a live system).

WSP has included a study in the capital projects list with a high-level budget for planning purposes, assuming the first phase would include the abovementioned desktop geotechnical and structural/civil study and review, a walkthrough of the aboveground portions of the alignment, and a costing/feasibility exercise for inspecting buried portions of the pipeline and reaching out to contractors to determine the best approach for an investigation of the marine crossing.

9.4.2 ASSESSMENT OF POWERHOUSE SPRINGS SUPPLY MAIN

A risk assessment of the existing Powerhouse Springs supply main should be conducted to ensure safety and reliability. Based on the results of the study, the District may want to consider a new watermain alignment connecting Powerhouse Springs up north to the Lower University Area. This new alignment would eliminate the risks associated with maintaining and operating a watermain that crosses the river, thereby reducing potential vulnerabilities and maintenance challenges.

For this WMP, a placeholder alignment and a Class D cost have been developed denoted as WMP D59 in Table 8-2. A feasibility/conceptual design study is required to determine suitable alignments, taking into consideration design constraints such as (but not limited to) existing ground conditions and environmental impacts.

9.4.3 ASSESSMENT OF POWERHOUSE SPRINGS' LONG-TERM CAPACITY

The District should undertake a thorough and detailed study to evaluate the potential of Powerhouse Springs as a sustainable, long-term water source. This study should encompass several key aspects:

- 1 Capacity Assessment:** Determine the maximum volume of water that Powerhouse Springs can reliably supply over an extended period. This includes analyzing seasonal variations, recharge rates, and historical data to ensure a consistent and dependable water source.
- 2 Environmental Impact:** Investigate the potential effects of increased water extraction on Powerhouse Creek and the surrounding ecosystem. This should include assessments of water quality, aquatic habitats, and any potential changes to the creek's flow patterns.
- 3 Permitting and Regulatory Constraints:** Identify any legal or regulatory requirements that must be met to utilize Powerhouse Springs as a water source. This includes obtaining necessary permits, adhering to environmental protection laws, and ensuring compliance with municipal and provincial regulations.

Based on the findings of this comprehensive study, the District may then want to consider further expanding the water extraction infrastructure at Powerhouse Springs in the mid-to-long term. This could involve the installation of additional wells and pumps to increase the water supply capacity, provided that the study confirms the feasibility and sustainability of such an expansion.

APPENDIX

A LONG TERM SOURCE DEVELOPMENT REVIEW



TECHNICAL MEMORANDUM

TO: David Roulston, P.Eng.
FROM: Michael Levin, P.Eng., PMP; Jack Grant; Christopher Lau, EIT
SUBJECT: **Technical Memorandum: District of Squamish Long Term Source Development Review – 2024 Update**
DATE: **December 6, 2024**

1 EXECUTIVE SUMMARY

The District of Squamish (District) retained WSP Canada Inc. (WSP) to update its 2015 Water Master Plan (WMP) for the District's water system. A key aspect of the WMP update is the Long-Term Source Development Review, which analyzes how future demand can be met for conditions at the end of the study period (2041), namely providing sufficient flow for the estimated future population of 60,400 residents.

This memorandum provides updates to the previously submitted business case in 2014 for considering water supply source expansion options, while developing upon the latest proposals for increased extraction from a new well at Powerhouse Springs in the immediate future to meet the existing Maximum Day Demand (MDD). This also includes Class D cost estimates and life-cycle cost analyses, including a detailed review of infrastructure-related requirements (such as pumping and storage requirements) that would enable the successful implementation of each strategy. An Implementation Strategy is provided at the end of this memo. The supply options reviewed include:

- Additional wells at Powerhouse Springs (Aquifer 397)
- A new well field in the Lower Mamquam Aquifer (Aquifer 398)
- Upgrade of the Stawamus and/or Mashiter surface water sources

All three options discussed above assume a near-term well/pump expansion at Powerhouse Springs to address immediate peak consumption demands, as the current supply is nearly at the District's 2023 MDD, as detailed further in this memorandum. Furthermore, the results of this high-level review are intended to provide direction as to which of the three long-term options should be investigated further.

The 17-year Life Cycle Cost (LCC) estimates to develop each water source option are summarized below in Table 1-1.



Table 1-1: 17-year Life Cycle Cost Summary

OPTION	CAPITAL COST	ANNUAL O&M	17-YEAR LCC ¹
Powerhouse Springs Well Field	\$1,041,480	\$288,175	\$4,407,431
Lower Mamquam Aquifer Well Field	\$13,044,428	\$378,900	\$17,472,308
Stawamus River Surface Water Treatment	\$2,073,720	\$319,658	\$5,809,875

Notes: (1) Net Present Value

Based on WSP’s analysis, it is recommended that the District expand the abstraction limit at Powerhouse Springs and install an additional high-capacity well by 2026 to meet growing water demands. A new watermain alignment from Powerhouse Springs to the north is also advised to mitigate risks associated with the two Mamquam River crossings.

During this period, the District should conduct a comprehensive study to assess the long-term capacity of Powerhouse Springs, its impact on Powerhouse Creek, and any permitting constraints. Based on the study’s results, further mid-term expansion at Powerhouse Springs, including additional wells and pumps, may be considered.

Additionally, feasibility studies should be conducted to evaluate Stawamus as an emergency and secondary source, focusing on flow availability, fishery requirements, and seismic resiliency. If Stawamus proves viable, the District should seek a filtration exclusion and install a treatment facility there in the long term. Combined with water conservation measures, this strategy will ensure that long-term water demands are met and help defer future source development.

2 INTRODUCTION

The District of Squamish supplies potable water to an estimated 29,206 residents in its community based on the latest 2023 Statistics Canada population estimate. The current water consumption is also greater than the national average, with an average daily consumption per capita of 457 L/c/d and a maximum daily per capita consumption of 725 L/c/d.

The water supply for the District is provided through seven groundwater wells at the Powerhouse Springs well site which is located near the confluence of Powerhouse Creek and the Mamquam River. Given the existing capacity of the Powerhouse Springs site, this would remain a primary water source into the future, however, the forecasted population increase will ultimately result in increased water capacity requirements for the District in order to match the increased demand. Additionally, high water usage in the summer months is a priority concern given the increase in severe weather events as a result of climate change.

The District also has two alternative sources from surface water supplies at Mashiter Creek and Stawamus River. Prior to the 1999-2000 study into the Powerhouse Springs well site and the subsequent well development that followed, the Mashiter Creek and Stawamus River intakes had supplied all the water to the District. Currently, these sources are not viable as a long-term solution due to their susceptibility to high turbidity during heavy rainfall, and the fact that they are only treated with chlorination. Additionally, these surface water sources have not been used by the District for more than a decade.



Three options were reviewed to supplement the Powerhouse Springs water source on the assumption that an additional 70 HP pump at a new well at Powerhouse Springs is already installed to deal with near-term demands. These are as follows:

- The first option is to further increase the capacity at the Powerhouse Springs water source through the construction of an additional well.
- The second option is to develop a new well field in the Lower Mamquam Aquifer. This option was the original alternative to the development of the Powerhouse Springs well field and has remained in consideration as a potential future source to expand the main supply.
- The third option focuses on the development of the surface water disinfection concept for the existing Stawamus River source. This memorandum details the requirements for water treatment (including filtration and UV disinfection) if the Stawamus water source was developed, similar to the analysis completed in 2014.

Alternative siting includes Aquifer 398 upgradient from the Mamquam River, as discussed in the 2023 Hydrogeology report by WSP.

As part of the Squamish Water Master Plan Update, numerous capital upgrades have been proposed to address network deficiencies based on current and projected growth within the District. By 2041, the maximum day demand (MDD) is expected to reach 479 L/s assuming an annual population growth rate of 4% (see Table 2-1). This represents a 25% increase over the previously forecasted 3% growth, reflecting the significant population surge Squamish has experienced post-COVID-19, which is well above the historical average.

If no upgrades are made to Powerhouse Springs beforehand, the District’s MDD is projected to meet and surpass the abstraction rate (255 L/s) by 2026. Therefore, consideration must be made for the immediate term to ensure a reliable water supply.

Table 2-1: Demand Estimates for Squamish

	2023 DEMAND (L/S)	2041 DEMAND (L/S)
Average Day Demand	156	255
Maximum Day Demand	245	479

2.1 CONDUCT OF STUDY

The following information was reviewed over the course of this study:

- Stawamus Surface Water Disinfection Concept Memorandum, KWL, May 2014
- Water Background Report, District of Squamish (Engineering), February 2014
- Hydrogeological Assessment for Well Protection Plan, Piteau, 2014
- Powerhouse Springs Well Protection Program, Piteau, 2014
- Well Redevelopment Program Powerhouse Springs Well Field, Piteau, 2014
- New Reservoir Strategic Location Assessment, KWL, 2013
- Completion Report Production Well PW-6 Reconstruction and Testing Program Powerhouse Springs, Piteau, 2007
- District Water Supply Strategy Report, Squamish Engineering, 2007
- Update of the Water Capital Plan - Revision 2, KWL, 1999
- Water Source Development Site Assessment of Mamquam River and Powerhouse Springs, KWL, 1999
- Hydrogeological Assessment of Mamquam River Test Well Program, Piteau, 1998
- Groundwater Source Study Phases II and III, Test Well Program and Final Assessment, Piteau, 1995



- Stawamus River and Mashiter Creek Watershed Assessment, Squamish Forest District, 1994
- District of Squamish - Water Master Plan: Long-Term Groundwater Supply Strategy Update, WSP, 2023

Class D cost estimates were based on previous experience and relevant reports.

3 FEASIBILITY OF SOURCES

3.1 POWERHOUSE SPRINGS WELL FIELD

3.1.1 WATER QUANTITY

Groundwater from the Powerhouse Springs well field (Aquifer 397 – Ring Creek Aquifer) currently supplies all of the District’s potable water needs. The well field is located approximately 5 km east of the Squamish Town Centre.

Groundwater flows through the Powerhouse Springs well field in a westerly direction, with total flow through the aquifer estimated to be approximately 800 L/s (Piteau 2014a). This value is supported by basic hydrogeological calculations completed by WSP using documented aquifer parameters. The aquifer parameters estimated by Piteau (2014) and supported by KWD (2019a) are as follows:

- transmissivity on the order of 2×10^{-2} m²/s
- hydraulic conductivity on the order of 6×10^{-4} m/s
- storativity ranging between 7×10^{-5} and 2×10^{-1}

WSP reviewed pumping data from the District’s SCADA system for 2018 to 2022 and observed data quality issues including missing data for Wells #1 and #2 (all years), transcription issues (i.e., erroneous repeat values) for Well #7 in 2021, and transcription issues for all wells in 2022.

Consequently, WSP obtained the MDD and ADD calculations from an alternative dataset provided by the District. The dataset was developed from a combined flow meter immediately downstream of the Powerhouse Springs Well Field, with the assumption that all water used within the District supply network was accounted for by this combined flow meter. The dataset consisted of total daily volumes of water pumped from the well field for each calendar day, thus representing average daily pumping rates. ADD was calculated for each calendar year by averaging all daily pumping rates. MDD was identified as the highest daily pumping rate for each calendar year.

Figure 3-1 illustrates the historical and current water demand, as well as the projected demands for the District up to 2041, assuming that per capita water demand remains at or below 2023 levels.

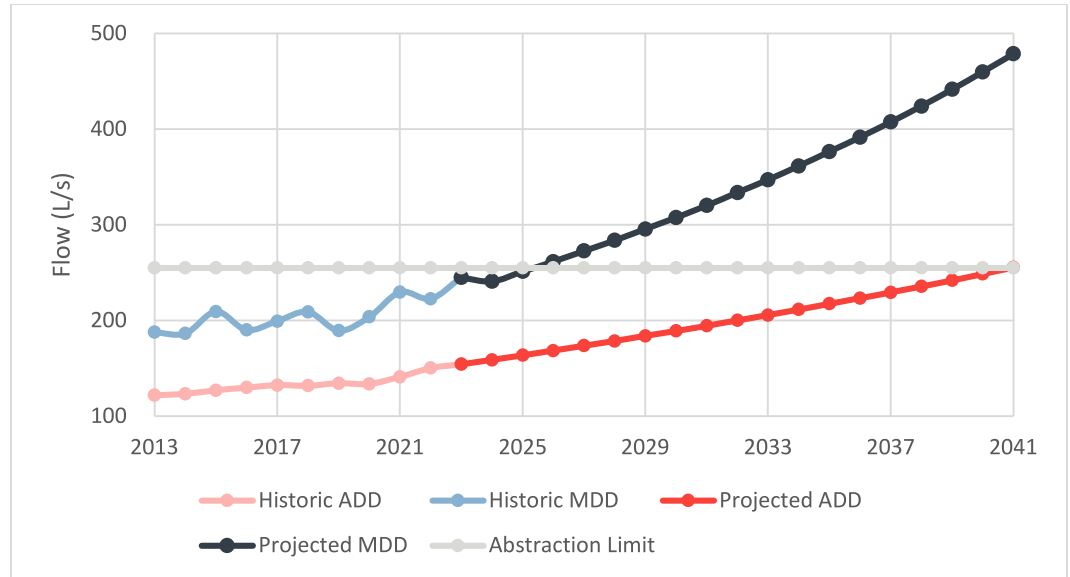


Figure 3-1: Projected ADD and MDD demand (from 2013 to 2041)

Based on Figure 3-1, ADD and MDD for 2023 were 154 L/s and 245 L/s, respectively. Although the 2023 MDD is slightly below the maximum abstraction limit of 255 L/s for Powerhouse Springs, it is projected to meet and exceed this limit by 2026 based on an annual population growth of 4%. This projection does not account for climate change, which is likely to result in reduced infiltration, slower groundwater recharge, and increased water demand during summers. Therefore, it is highly likely that there is an increased risk to consider.

For comparison, the total aquifer yield estimated by Piteau (2014a) is 800 L/s. The total yield cannot be fully utilized because withdrawal rates must consider the environmental flow needs of watercourses that are hydraulically connected to the aquifer. It is anticipated that as withdrawal rates increase in line with population growth, the effect of pumping on the aquifer and nearby watercourses will require additional study. To better understand the dynamics between withdrawal rates, aquifer recharge, and nearby watercourses, the development of a numerical flow model may be necessary.

As per discussions with District officials as well as their consulting hydrogeologist (KWD 2023), Powerhouse Springs has a relatively high productivity and is expected to be able to support the construction and pumping of more wells. This is supported by an investigation on well interference conducted by KWD (2019a), which indicated that limited drawdown was observed in non-operational wells during consistent pumping at active wells, only tens of meters away. If more wells were installed at Powerhouse Springs, a request to increase the licensed withdrawal rate would be required. Installing additional wells at Powerhouse Springs is likely to be the most cost-effective option for increasing water supply capacity, given its high productivity.

Based on discussions with District staff as well as communications received by the District (District of Squamish 2023b), a key consideration for expansion in the well field at Powerhouse Springs is the conveyance infrastructure that links the well field to the supply network. The water from the well field is pumped up to the University Zone (Opus 2015) to facilitate a gravity-feed supply approach to other neighbourhoods. Between Powerhouse Springs and the University Zone, there are three creek crossings: two over the Mamquam River, and one over Ring Creek. In addition to potential hazards posed by flood or seismic events, falling trees, high river flows and

debris flows pose a hazard to the suspended supply line crossings. It is therefore recommended that alternative supply lines are considered to increase the security of the future supply or upgrades are made to the conveyance infrastructure downstream of the well field.

In addition to the above, recent rehabilitations have been completed on several wells within the Powerhouse Spring well field between 2019 to 2022 although in some cases, rapid performance declines have been observed in some wells in the years that follow the rehabilitation programs.

3.1.2 WATER QUALITY

The Piteau studies conducted as part of the Well Protection Plan indicated that the groundwater at Powerhouse Springs meets health-based standards set out in Health Canada's 2012 Guidelines for Canadian Drinking Water Quality (GCDWQ). Samples taken from PW-5 and PW-7 indicate that turbidity levels range from less than 0.10 NTU to 0.37 NTU. This is below the GCDWQ allowable levels, which state that raw water sources should be less than 1.0 NTU and cannot exceed 5.0 NTU. PW-7 is currently the lead production well, while PW-5 is also engaged most of the time. Please note that while the data available from the Piteau studies has been used in this study and considered applicable for the long term source development study and order-of-magnitude cost estimating of infrastructure upgrades and cost comparisons, the District does conduct chemical and physical analysis bi-annually and the latest available datasets should be used for any further detailed studies arising.

3.2 LOWER MAMQUAM AQUIFER WELL FIELD

3.2.1 WATER QUANTITY

The Lower Mamquam Aquifer (Aquifer 398) is a potential site for a secondary groundwater source supply which was identified in a 1994 study conducted by Piteau as a potential area for developing a large potable water supply. The area of interest is within the Lower Mamquam Aquifer, between the confluence of the Mamquam River and Mashiter Creek east of Powerhouse Springs.

From Piteau's Hydrogeological Assessment of Mamquam River Test Well Program (1998), the following was known about the aquifer identified beneath the lower reaches of the Mamquam River:

- The aquifer is unconfined and is thought to recharge primarily through seepage from infiltration of direct precipitation, and more significantly through seepage from the Mamquam River and Mashiter Creek. The latter source will allow for year-round recharge.
- Hydraulic impacts would include a slight reduction in Mamquam River flow and a slight drawdown at the Newport Ridge Estates, located approximately 1.5 km southwest of the site. No flow reductions are expected in Mashiter Creek.

The development of the Lower Mamquam Aquifer well field would likely make use of existing conveyance infrastructure north of Powerhouse Springs. Given the existing risks to the infrastructure at Powerhouse Springs, the area immediately to the north of the Mamquam River, between Piteau TH-1 and Powerhouse Springs, serves as a reasonable target for further hydrogeological investigation which falls within the footprint of Aquifer 398. This section of the aquifer is located in a strategically viable area with the need for only one river crossing over Ring Creek, assuming groundwater would be pumped to storage locations in the Lower University Zone. Developing groundwater supply options in this area would bolster system redundancy and



reduce susceptibility to seismic or wind damage. Furthermore, a separate well field would mitigate the District's susceptibility to localized power outages or contamination events at Powerhouse Springs. However, it's important to acknowledge that the area around TH-1 is prone to flooding and contamination due to nearby industrial land uses. These benefits can also be achieved by re-routing the Powerhouse Supply Main and abandoning the Mamquam River crossings. Developing a new well field would also require amending the District's Source Water Protection Plan and expanding the Aquifer Protection Zone. The Source Development section outlines the feasibility of developing the Lower Mamquam Aquifer well field as a secondary supply to the Powerhouse Springs well field, which will continue to operate as the primary source of potable water for the District.

3.2.2 WATER QUALITY

Piteau's Hydrogeological Assessment of Mamquam River Test Well Program (1998) states the Lower Mamquam Aquifer has water quality similar to that of the Powerhouse Springs. The water was found to have a hardness of less than 20mg/L-CaCO₃ equivalent and met the 2022 Guidelines for Canadian Drinking Water Quality.

A concern identified in the Piteau report was the proximity of the capture zone for the well field to light commercial and industrial areas. From reviewing Schedule B – Land Use of the District's Official Community Plan (2009), the areas surrounding the proposed well field have been identified as:

- Employment and Industrial, to the southeast;
- Residential Neighborhoods, to the north and east;
- University Neighborhood, to the north; and,
- Greenway Corridors and Recreation, to the east, west, and southwest.

These concerns are likely irrelevant when considering areas further south and east of the Piteau investigation area, specifically within the Lower Mamquam Aquifer area. Additionally, further testing would be required to determine the present water quality, and whether there is a risk of contamination to the aquifer from the surrounding areas.

3.3 STAWAMUS RIVER & MASHITER CREEK SURFACE WATER SOURCES

3.3.1 WATER QUANTITY

The Squamish Forest District's Stawamus River and Mashiter Creek Watershed Assessment (1994) locates the Stawamus River Watershed as located approximately 6 km southeast of Downtown Squamish, with a drainage area of 4,062 ha. Mashiter Creek is approximately 13 km northeast of Downtown Squamish and has a drainage area of 2,556 ha.

Until 2000, the Stawamus River and Mashiter Creek surface water sources were the main supply of potable water to the District. Since being replaced by the Powerhouse Springs water source, these surface water sources are used only in periods of peak demand as backup/emergency supplies and have not been depended upon for over a decade. The District's surface water licenses restrict the withdrawal limit to 132 L/s from the Stawamus River and 184 L/s from Mashiter Creek, totaling 316 L/s.



This section has been extracted from the previously completed memo (October 2014) and builds upon KWL's Stawamus Surface Water Disinfection Concept Memo (2014), which has developed a concept and cost estimate detailing the feasibility of utilizing the Stawamus water source to supplement the Powerhouse Springs source. The memo has identified the Stawamus River source as a better candidate for treatment rather than the Mashiter Creek site for the following reasons:

- The Stawamus Intake is understood to require less maintenance due to the stability of the river channel (compared to Mashiter Creek);
- Better access to the intake and the existing chlorination building;
- More room within the existing chlorination building and also more room for expansion of the treatment building if required; and,
- Better connected to much of the system (impacts supply capacity and risk).

There are, however, some concerns with developing a water supply from the Stawamus River source. These include supply concerns during summer months when water usage is high, and water quality issues as described below. No additional permitting would be required through developing this source for long-term supply.

3.3.2 WATER QUALITY

Water quality has historically been an issue for the two surface water supply sources. While water quality is typically at its best during the high demand season (June to Sept), there have been turbidity spikes in association with heavy rain events in the fall/winter. Boil water advisories have been issued in the past during high turbidity flows. The District Water Supply Strategy (Squamish Engineering, 2007) stated that boil water advisories are issued when the turbidity of the water exceeds 5 NTU's. These are factors to take into consideration for the likelihood of obtaining a filtration exclusion or deferral for the Stawamus River surface water source.

The BC Drinking Water Protection Act allows for some cases of filtration exclusion or deferral. In order to qualify, a major guideline is that the water supply not exceed 1 NTU. KWL's Stawamus Surface Water Disinfection Concept (2014) previously looked into the District qualifying for this exclusion. Since the Stawamus River source supply is intended for use as a secondary source to the Powerhouse Springs well field source, there is a possibility of obtaining an exclusion for the peak operating months of July and August.

Turbidity is generally highest during heavy rainfall following a dry period, and while there are some cases of NTU exceedance, these periods do not typically coincide with peak demand periods in the District (July and August). As previously mentioned, no further analysis has been completed on these sources since the 2014 study, however for comparison, the District had provided turbidity data for all of 2011, and in 2013 from January to August. In 2011, turbidity exceeded 1 NTU once in June and once again in December with turbidity exceeding 1 NTU twice in January which justifies the theory of the periods not typically coinciding.

Assuming that the application for filtration exclusion is successful, the development of the Stawamus River surface water source for long-term use when turbidity is less than 1 NTU is a viable option.

This study provides a cost estimate for the UV treatment required in Table 4-3 of the report.



4 SOURCE DEVELOPMENT

The following section reviews the technical requirements necessary to utilize the aforementioned water sources as a potable water supply to support the existing Powerhouse Springs supply. The costs are calculated based on a projected MDD of 479 L/s and exclude any pre-design studies, such as source capacity studies and water quality studies.

For all options reviewed in this memorandum, it is assumed that Powerhouse Springs will continue to be the primary source of potable water for the District. It is further assumed that an additional pump at Powerhouse Springs will be installed in the near term to deal with the immediate risk posed by the 2023 MDD of 245 L/s approaching the current firm capacity of 275 L/s. Due to this, a new 70 HP pump is recommended, adding approximately 80 L/s to Powerhouse Springs. Note that 80 L/s is on the higher end of the estimate compared to the output of the existing wells. This increased yield will boost the firm capacity of Powerhouse Spring to around 355 L/s, providing a measure of water security for the District of Squamish for the next 10 years, assuming present-day per capita consumption rates and a 4% population growth rate.

Based on the Long-Term Groundwater Supply Strategy Memo (2023), it has been estimated that the above near-term upgrades to Powerhouse Springs will cost approximately \$700,000 inclusive of engineering and contingency costs.

Therefore, source supply options have been assessed for providing an additional 124 L/s to supplement the newly updated Powerhouse Springs practical output capacity of 355 L/s.

4.1 POWERHOUSE SPRINGS WELL FIELD COST ESTIMATE

Further development of the Powerhouse Springs well field in addition to the new well in the immediate future would require the construction of a further new well and associated appurtenances including a 125 HP pump, along with required additions to the control building. The added capacity would provide for the additional demand required, exceeding the 2041 MDD by approximately 15 L/s without the need for additional storage on-site. Future storage requirements form part of the overall system capacity upgrade requirements and are addressed in the 2024 Water Master Plan Update.

Capital costs for the well expansion upgrades at Powerhouse Springs are provided in Table 4-1. A detailed cost breakdown is included in Appendix A.



Table 4-1: Cost Estimate for Powerhouse Springs Well Field

ITEM	DESCRIPTION	UNIT	PRICE
3	Powerhouse Springs Well Field Upgrade		
3.1	Supply and install a new well, with one 125 HP pump, and all appurtenances and connections to the power grid.	L.Sum	\$431,200
3.2	Upgrades to control building, including user interface, installing MCC including UFDs, and all appurtenances	L.Sum	\$200,000
Subtotal			\$631,200
Contractor OH&P (10%)			\$63,120
Contingency (30%)			\$189,360
Engineering (25%)			\$157,800
TOTAL			\$1,041,480
Annual O&M			\$288,175
17-year LCC (5% discount rate)			\$4,407,431

Unit costs were developed from the 2014 memorandum and updated to present costs using ENR values. Wherever possible, recent similar WSP projects were used to compare and update costs. Replacement and rehabilitation costs are based on the District’s financial records. General operation and maintenance were taken as 3% of the capital costs for the well and control building upgrade. Annual operations and maintenance costs are included for the entire well field, including the existing seven (7) wells in addition to the proposed well. The annual power consumption was calculated using a future ADD of 255 L/s, providing water to meet a daily demand of 22 MLD.

4.2 LOWER MAMQUAM AQUIFER WELL FIELD COST ESTIMATE

As noted in the Long-Term Groundwater Supply Strategy Memo (2023), WSP conducted a surficial geological mapping review to support the evaluation of potential new groundwater supply locations beyond existing wells or aquifers currently being utilized. Based on this analysis, an “Area of Interest” was identified extending west and north from Powerhouse Springs (see Table 4-1). Within this “Area of Interest”, the northernmost portion was considered most appropriate for further investigation as it would allow for making use of existing conveyance infrastructure north of Powerhouse Springs while minimizing river crossings. The “Proposed Investigation” rests within the footprint of Aquifer 398 (i.e. Lower Mamquam Aquifer), for which the District’s 1999 project approval certificate for groundwater extraction up to 255 L/s may still be applicable, in addition to the ongoing permitted withdrawal of 255 L/s from Powerhouse Springs. The portion of the “Proposed Investigation” area which is adjacent to the unpaved section of Mamquam Road between Piteau TH-1 and Ring Creek is located in a strategically viable area with the need for only one river crossing over Ring Creek, assuming groundwater would be pumped to storage locations in the Lower University Zone.

Developing groundwater supply options in this area and/or at Stawamus River would enhance redundancy in the District’s water supply system, which is a key objective supported by both the District and Vancouver Coastal Health.

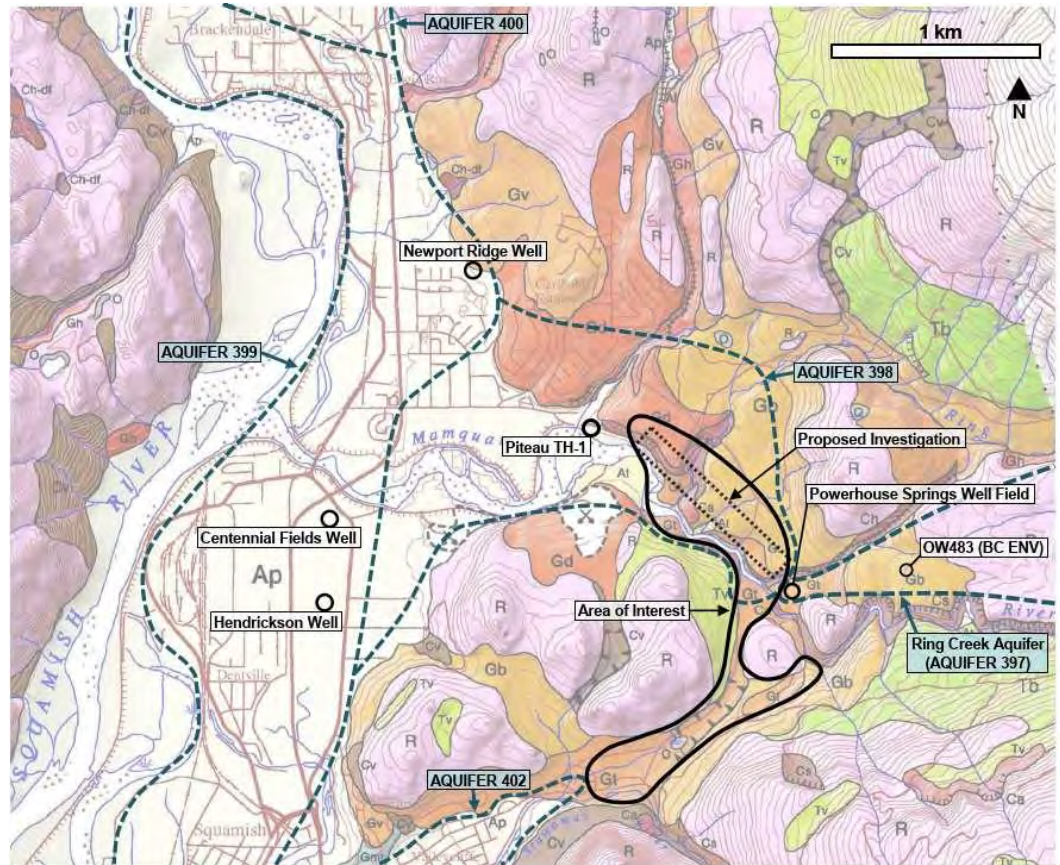


Figure 4-1: Surficial Geology of the Squamish Region, Provincial Aquifer Boundaries, and Area of Interest for Supplementary Groundwater Resources (WSP, August 2023)

For the purpose of evaluating source development costs and comparing options, WSP has updated the Lower Mamquam Aquifer well field development option from the 2015 WMP to reflect current costs. This update is based on the recommended development option from the 1999 Water Source Development Site Assessment of Mamquam River and Powerhouse Springs. The proposed site is adjacent to the preferred northwesternmost portion of the “Proposed Investigation” corridor within the Area of Interest identified in WSP’s August 2023 report. As noted earlier, this area is unlikely to be an appealing or viable option due to its proximity to industrial and commercial land use, however, given the uncertainty of future well field location, this previous concept has been used for the purposes of cost estimation.

As the Powerhouse Springs well field would continue to operate as the primary source of potable water, the Lower Mamquam Aquifer well field is assessed as a secondary supply source. Therefore, the well field has been sized for two (2) wells, each with a 100 HP pump to provide an approximate additional 134 L/s capacity to the existing Powerhouse Springs source. This will enable the Lower Mamquam Aquifer well field, in conjunction with new a well at Powerhouse Springs, to supply the District with water exceeding the 2041 MDD of 479 L/s by approximately 10 L/s.



Operations and maintenance costs are calculated for both well fields, including the existing seven (7) wells and one (1) newly installed well at Powerhouse Springs, in addition to the proposed Lower Mamquam Aquifer well field. There is the possibility of expanding the Lower Mamquam Aquifer well field further into the future to accommodate the increasing population and demand of Squamish.

In addition to the wells and control building, the construction of a raw water transmission main approximately 1,400 m long would be required to connect to the existing North Stawamus Supply Main. Due to the low elevation of the well field and the subsequently high pumping requirements, a 1 ML enclosed storage reservoir and booster pump station have been included in the design estimates of this option. Raw water would be chlorinated at the control building before being delivered to the storage reservoir. The booster pump station would deliver water to the Lower University Storage Reservoir by tying it into the North Stawamus Supply Main.

Capital costs for the new Lower Mamquam Aquifer well field are provided in Table 4-2. A detailed cost breakdown is included in Appendix A with a concept-level site plan for the proposed Lower Mamquam Aquifer well field found attached to the end of the memorandum.

Table 4-2: Cost Estimate for Lower Mamquam Aquifer Well Field

ITEM	DESCRIPTION	UNIT	PRICE
4	Lower Mamquam Aquifer Well Field Upgrade		
4.1	Supply and install two new wells, with two duty 100 HP pumps and all appurtenances and connections to the power grid.	L.Sum	\$1,140,800
4.2	Construct control building, erosion control, heating and lighting, user interface, chlorination system, installing MCC including UFD's, and all appurtenances	L.Sum	\$720,200
4.3	Supply and install 1400 m of 450 mm watermain with all tie-ins and appurtenances to connect to the storage reservoir and the North Stawamus Supply Main	L.Sum	\$2,500,900
4.4	Supply and install a booster pump station, including heating and lighting, user interface, three 75 HP pumps (2 duty, 1 standby), connection to the power grid, and all appurtenances	L.Sum	\$2,179,600
4.5	Construct a 1 ML enclosed storage reservoir, with all associated earthworks and site preparation	L.Sum	\$1,200,000
Subtotal			\$7,741,500
Contractor OH&P (10%)			\$774,150
Contingency (33.5%)			\$2,593,403
Engineering (25%)			\$1,935,375
TOTAL			\$13,044,428^a
Annual O&M			\$378,900
17-year LCC (5% discount rate)			\$17,472,308

a) The cost estimate provided is based on conservative assumptions. Costs and design requirements will differ depending on the final well field site.



Unit costs were developed from previous studies, mainly the 1999 Water Source Development Site Assessment of Mamquam River and Powerhouse Spring and updated to present costs using ENR values. The cost of the control building was increased by 20% to account for erosion control. Wherever possible, recent similar WSP projects were used to compare and update costs.

Replacement, rehabilitation, and chlorination costs are based on the District's financial records. General operation and maintenance were taken as 3% of the capital costs for the well and control building. Annual operations and maintenance costs are included for the entire source supply, including the existing seven (7) and one (1) newly installed well at Powerhouse Springs in addition to the proposed Mamquam River wells. The annual power demand was calculated using a projected 2041 ADD of 479 L/s.

Note that there is significant uncertainty associated with costs for this option given the preferred location within the Lower Mamquam Aquifer is yet to be determined, therefore, fees for land acquisition, required withdrawal permits and access roads have been excluded.

4.3 STAWAMUS RIVER SURFACE WATER TREATMENT COST ESTIMATE

The existing water license allows for a withdrawal from the Stawamus River of 132 L/s. For comparison, it is assumed that the Powerhouse Springs well field would continue to operate as the primary source of potable water, with the Stawamus River surface water source sized to provide 132 L/s of treated potable water during MDD which would bring the combined maximum capacity to 487 L/s adding to the latest Powerhouse Springs supply.

Developing the Stawamus River surface water source will require the addition of a UV disinfection facility. In 2014, the Surface Water Disinfection Concept report was produced for design considerations. Although the Ultraviolet Light Transmittance (UVT) of the raw water is unknown, other indicators such as colour, dissolved organic carbon, and turbidity were low in two water samples taken from the Stawamus River and Powerhouse Springs water sources in November 2011 and January 2013. This information was provided by the District for the purpose of the 2014 Surface Water Disinfection Concept report. Given this information, cost estimates for the UV facility taken from the report are for the 70% Design UVT.

With UV treatment being used for this water source, a new reservoir downstream of the UV disinfection facility to meet chlorination contact time requirements will not be necessary. Two 500 mm watermains will be needed to link the UV facility to the existing system, but there is no need to expand access roads.

Since this water source will utilize UV treatment, there will be no need for a new reservoir downstream of the UV disinfection facility to address chlorination contact time requirements. Two 500 mm watermains are required to connect the UV facility to the existing system, though expanding access roads is not required.

Capital cost estimates for the new treated surface water supply at the Stawamus River are provided in the following table with a detailed cost breakdown included in Appendix A. Repairs and upgrades to the intake and raw water transmission mains are likely necessary and are currently being assessed by another consultant.



Table 4-3: Cost Estimate for Stawamus River Surface Water Extraction

ITEM	DESCRIPTION	UNIT	PRICE
5	Stawamus River Surface Water Treatment		
5.1	UV disinfection at Stawamus River surface water treatment plant	L.Sum	\$948,800
5.2	Construct two 500 mm watermains (220 m total) to connect the UV facility to the existing distribution system.	L.Sum	\$308,000
Subtotal			\$1,256,800
Contractor OH&P (10%)			\$125,680
Contingency (30%)			\$377,040
Engineering (25%)			\$314,200
TOTAL			\$2,073,720
Annual O&M			\$319,658
17-year LCC (5% discount rate)			\$5,809,875

Unit costs were developed from WSP project experience. Costs were developed for a 132 L/s UV treatment plant. Power supply estimates were based on similar projects. Operations and maintenance costs were estimated by taking the median value of typical Canadian salary ranges for required personnel (detailed in Appendix A). A high-level site plan is appended to this memorandum.

5 DISCUSSION AND RECOMMENDATIONS

The benefits and drawbacks of each option have been summarized in Table 5-1 with their respective costs outlined in Table 5-2.

Table 5-1: Options Benefits and Drawbacks

SOURCE DEVELOPMENT OPTION	BENEFITS	DRAWBACKS
Powerhouse Springs Well Field	<ul style="list-style-type: none"> — Least amount of infrastructure required — Least expensive option 	<ul style="list-style-type: none"> — Requires permitting approvals to increase abstraction limit
Lower Mamquam Aquifer Well Field	<ul style="list-style-type: none"> — Provides redundancy to the system — Increased resilience to population growth and climate change — Increased asset security in a lower-risk environment 	<ul style="list-style-type: none"> — Most expensive option — Significant pumping requirements



SOURCE DEVELOPMENT OPTION	BENEFITS	DRAWBACKS
Stawamus River Surface Water Treatment	<ul style="list-style-type: none"> — Licensed to extract an additional 132 L/s — Utilizes existing infrastructure that is currently maintained for emergency use — Significantly lower cost compared to Lower Mamquam Aquifer Well Field — Lower operating costs (no pumping required) — Provides redundancy to the system — High-quality water during high-demand periods 	<ul style="list-style-type: none"> — Variable water quality will require active operations management

Table 5-2: Options Cost Summary

OPTION	FACTOR	PRICE
Powerhouse Springs Well Field		
3.1	Capital Cost	\$1,041,480
	Annual O&M	\$288,175
	17-Year Life Cycle Cost	\$4,407,431
Lower Mamquam Aquifer Well Field		
3.2	Capital Cost	\$13,044,428
	Annual O&M	\$378,900
	17-Year Life Cycle Cost	\$17,472,308
Stawamus River Surface Water Treatment		
3.3	Capital Cost	\$2,073,720
	Annual O&M	\$319,658
	17-Year Life Cycle Cost	\$5,809,875

After evaluating the costs, benefits, and drawbacks of the three source options, WSP recommends expanding the abstraction limit at Powerhouse Springs. This expansion would allow for the installation of an additional high-capacity well by 2026 to meet the growing water demands in the District. To address current and future reliability concerns of the Powerhouse Springs supply main, it is also recommended to construct a new watermain alignment from Powerhouse Springs to the north and abandon the Mamquam River crossing.

During this period, the District should conduct a comprehensive study to determine the potential capacity of Powerhouse Springs as a long-term source, its impacts on Powerhouse Creek, and any



permitting constraints. Based on the study’s results, the District may want to consider further mid-term expansion at Powerhouse Springs, such as additional wells/pumps.

Additionally, feasibility studies for using Stawamus River as an emergency and secondary source should be conducted. These studies should assess the river’s flow availability, nearby fishery flow requirements, and the seismic resiliency of the area before installing treatment facilities at Stawamus.

If Stawamus proves to be a reliable water source, the District should seek a filtration exclusion and install a treatment facility there in the long term. Combined with water conservation measures, this approach would ensure that water demands are met in the long term and help defer future source development as much as possible. A high-level roadmap is outlined in Table 5-3 below.

Table 5-3: Proposed Development Roadmap


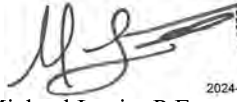
ITEM	ACTION
1	Pursue an expansion to the current 22 MLD abstraction limit at Powerhouse Springs to increase allowable withdrawal.
2	Rehabilitate existing wells on an annual basis (~1 to 2 wells per year) to ensure maximum well productivity (~\$60,000 per well)
3	Build a new pumping well at Powerhouse Springs in the near term with a 70 HP pump installed (\$1,041,480)
4	Pursue a filtration exclusion for the Stawamus River source to be able to utilize the Stawamus River on an emergency basis or to supplement during very high flow periods (i.e. July to August)
5	Continue water conservation efforts and follow the latest Water Conservation Plan to manage water consumption and defer future source development projects as much as possible.
6	Conduct assessments of existing major water transmission supply lines from Powerhouse Springs in relation to seismic, flood, and wind event susceptibility (\$150,000 for desktop/planning study)
7	Address reliability concerns with the Powerhouse Springs supply main by constructing a new transmission main from Powerhouse Springs to the north and abandoning the existing Mamquam River Crossing.
8	Conduct an assessment of Powerhouse Springs’ long-term capacity to determine its available capacity, impacts on Powerhouse Creek, and permitting constraints (~\$100,000 for investigation)
9	Conduct feasibility studies into Stawamus River to determine the river’s flow availability, nearby fishery flow requirements, and seismic resiliency. This can be part of a wider Stawamus Watershed Protection Plan.
10	Pending above studies and water conservation efforts, consider additional long-term expansion of Powerhouse Springs or addition of UV disinfection at Stawamus River source to meet long term water supply needs.



6 CLOSURE

We trust that this memorandum meets your needs. Please kindly advise if you have any questions.

Yours sincerely,



Michael Levin, P.Eng., PMP
Project Manager, Infrastructure



Christopher Lau, EIT
Hydraulic Modeller, Infrastructure

WSP ref.: 221-11672-00
JG/CL/ML/ab

PERMIT NUMBER: 1000200

WSP CANADA INC. 2024-12-06



APPENDIX A | SUPPORTING FIGURES & CALCULATIONS

Long Term Source Development Options
Detailed Power Consumption Calculations

Design Variables	
Average Day Demand (ADD)	
2023	156.0 L/s
2041	255.0 L/s
PHS Capacity (new existing)	321.0 L/s
Upgraded Capacity	158.0 L/s
TWL Lower University Blvd. Reservoir	134.5 m
Powerhouse Springs well elevation	90.0 m
Mamquam Wells ground elevation	10.0 m
TWL Mamquam Tank	66.0 m
Volume Mamquam Tank	1.0 ML
PHS Diameter	450.0 mm
Mamquam Wells Diameter	300.0 mm
PHS Length	520.0 m
Mamquam Wells Length	700.0 m
C-Factor	130.0
Design Flow (MDD)	479.0 L/s
Specific Gravity	1.0
Pump Efficiency	0.8
Current Capacity Powerhouse Springs	
Allowable	255.0 L/s
Maximum Yield	370.0 L/s
Current Capacity Stawamus River	
Allowable	131.5 L/s
Maximum Yield	129.0 L/s

Power Costs & Variables	
BC HYDRO - Large General Service	
Basic Charge	\$ 0.2708 /d
Demand Charge - first 35 kW	\$ 12.50 /kW
Demand Charge - next 115 kW	\$ 12.50 /kW
Demand Charge - remaining kW	\$ 12.50 /kW
Energy Charge Pt 1	
first 14,800 kW-hr	\$ 0.0614 /kWh
remaining kw-hr up to baseline	\$ 0.0614 /kWh
Energy Charge Pt 2	
20% above or below baseline	\$ 0.0614 /kWh
Power Factor Surcharge	-
Discounts	
Metered at primary potential	1.5% entire bill
Customer supplies transformation from primary to secondary potential	\$ 0.25 /kW
Monthly Minimum Charge	50% of highest max demand charge billed in any month within an on-peak period
Minimum Energy Charge	\$ 0.0614 /kWh when the Energy Charge (Part 1 & 2) divided by the total kWh is less than
Rate Rider	5% Rate Rider applied to all charges, before taxes and levies

Unsure on demand specific rates? Page 2-35 >
[https://www.bchydro.com/content/dam/BCHydro/customer-](https://www.bchydro.com/content/dam/BCHydro/customer-https://www.bchydro.com/content/dam/BCHydro/customer-)

Usage or savings beyond 20% of baseline are based on Part 1 & 2 assumed compliance. See Electric Tariff, Section 7.2 for details

If entitled to both discounts, 1.5% discount applied first

**Baseline is average historical use for the same billing period over the past 3 years. If you use less energy than baseline, you receive a credit*

Option 1 - Powerhouse Springs Well Field Upgrade

Average (2023-2041) = \$77,131.96

NPV (discount rate = 5%) = \$898,943.74

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
ADD [L/s]	156.0	161.5	167.0	172.5	178.0	183.5	189.0	194.5	200.0	205.5	211.0
Daily Demand [ML/d]	13.5	14.0	14.4	14.9	15.4	15.9	16.3	16.8	17.3	17.8	18.2
BASELINE PHS											
Headloss [m]	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1
Total Dynamic Head [m]	45.1	45.2	45.2	45.2	45.3	45.3	45.4	45.4	45.5	45.5	45.6
Total Horsepower [HP]	86.7	89.8	92.9	96.1	99.3	102.4	105.6	108.8	112.0	115.2	118.4
UPGRADE - PHS											
Headloss [m]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Dynamic Head [m]	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6
Total Horsepower [HP]	28.5	29.5	30.6	31.6	32.6	33.6	34.6	35.6	36.6	37.6	38.7
Power usage by pumps [kW]	85.9	89.0	92.1	95.2	98.3	101.4	104.6	107.7	110.8	114.0	117.1
Daily Power Usage [kW-hr/d]	2,061.64	2,135.86	2,210.22	2,284.74	2,359.42	2,434.26	2,509.27	2,584.46	2,659.82	2,735.36	2,811.08
Monthly Power Usage [kW-hr/month]	61,849.32	64,075.75	66,306.69	68,542.28	70,782.64	73,027.92	75,278.23	77,533.71	79,794.48	82,060.67	84,332.40
Baseline [kW-hr/month]	44,846.06	53,347.69	56,923.71	64,077.25	66,308.24	68,543.87	70,784.28	73,029.60	75,279.95	79,794.48	82,060.67
Threshold usage above or below baseline [kW-hr/month]	8,969.21	10,669.54	11,384.74	12,815.45	13,261.65	13,708.77	14,156.86	14,605.92	15,055.99	15,958.90	16,412.13
Usage Difference -Monthly to Baseline	0%	20%	16%	7%	7%	7%	6%	6%	6%	3%	3%
Annual Power Supply [kW-hr]	752,500.08	779,588.24	806,731.35	833,931.02	861,188.83	888,506.34	915,885.14	943,326.78	970,832.81	998,404.78	1,026,044.25
Basic Charge	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12
Demand Charge \$/kW	\$1,073.77	\$1,112.43	\$1,151.16	\$1,189.97	\$1,228.87	\$1,267.85	\$1,306.91	\$1,346.07	\$1,385.32	\$1,424.66	\$1,464.10
Energy Charge Part 1	\$2,753.55	\$3,275.55	\$3,495.12	\$3,934.34	\$4,071.33	\$4,208.59	\$4,346.15	\$4,484.02	\$4,622.19	\$4,899.38	\$5,038.52
Energy Charge Part 2	\$1,594.71	\$1,313.81	\$576.11	\$274.15	\$274.73	\$275.32	\$275.93	\$276.55	\$277.19	\$139.14	\$139.48
Discounts	-\$102.93	-\$107.90	-\$101.48	-\$104.90	-\$108.32	-\$111.76	-\$115.20	-\$118.64	-\$122.10	-\$125.56	-\$129.04
Monthly Minimum Charge	\$1,073.77	\$1,112.43	\$1,151.16	\$1,189.97	\$1,228.87	\$1,267.85	\$1,306.91	\$1,346.07	\$1,385.32	\$1,424.66	\$1,464.10
Minimum Energy Charge	\$4,348.26	\$4,589.36	\$4,071.23	\$4,208.50	\$4,346.05	\$4,483.91	\$4,622.08	\$4,760.57	\$4,899.38	\$5,038.52	\$5,178.01
Total Monthly	\$5,327.23	\$5,602.01	\$5,129.03	\$5,301.69	\$5,474.72	\$5,648.13	\$5,821.93	\$5,996.12	\$6,170.73	\$6,345.75	\$6,521.20
Total Yearly (before tax)	\$63,926.73	\$67,224.16	\$61,548.38	\$63,620.30	\$65,696.65	\$67,777.55	\$69,863.11	\$71,953.46	\$74,048.72	\$76,149.00	\$78,254.43

Option 2- Powerhouse Springs + Mamquam Well Field
 Average (2023-2041) = \$112,146.52
 NPV (discount rate = 5%) = \$1,309,098.79

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
ADD [L/s]	156.0	161.5	167.0	172.5	178.0	183.5	189.0	194.5	200.0	205.5	211.0
Daily Demand [ML/d]	13.5	14.0	14.4	14.9	15.4	15.9	16.3	16.8	17.3	17.8	18.2
BASELINE PHS											
Headloss [m]	1.1	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1
Total Dynamic Head [m]	45.6	45.2	45.2	45.2	45.3	45.3	45.4	45.4	45.5	45.5	45.6
Total Horsepower [HP]	116.7	89.8	92.9	96.1	99.3	102.4	105.6	108.8	112.0	115.2	118.4
UPGRADE - MWF - 1 ML Reservoir											
Headloss [m]	0.8	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.2	1.3	1.4
Total Dynamic Head [m]	56.8	56.8	56.9	56.9	57.0	57.1	57.1	57.2	57.2	57.3	57.4
Total Horsepower [HP]	36.4	37.7	39.0	40.3	41.6	43.0	44.3	45.6	47.0	48.3	49.7
UPGRADE - 1ML Reservoir - Lower University Blvd. Reservoir											
Headloss [m]	0.8	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.2	1.3	1.4
Total Dynamic Head [m]	69.3	69.3	69.4	69.4	69.5	69.6	69.6	69.7	69.7	69.8	69.9
Total Horsepower [HP]	44.4	46.0	47.6	49.2	50.8	52.4	54.0	55.6	57.2	58.9	60.5
Power usage by pumps [kW]	147.2	129.3	133.8	138.4	142.9	147.5	152.1	156.6	161.2	165.8	170.5
Daily Power Usage [kW-hr/d]	3,532.31	3,103.63	3,212.21	3,321.05	3,430.18	3,539.60	3,649.32	3,759.33	3,869.67	3,980.32	4,091.29
Monthly Power Usage [kW-hr/month]	105,969.20	93,109.05	96,366.23	99,631.63	102,905.49	106,188.02	109,479.46	112,780.03	116,089.96	119,409.47	122,738.80
Baseline [kW-hr/month]	60,336.95	83,153.07	86,471.73	98,481.49	96,368.97	99,634.45	102,908.38	106,190.99	109,482.50	112,783.15	119,409.47
Threshold usage above or below baseline [kW-hr/month]	12,067.39	16,630.61	17,294.35	19,696.30	19,273.79	19,926.89	20,581.68	21,238.20	21,896.50	22,556.63	23,881.89
Usage Difference -Monthly to Baseline	0%	12%	11%	1%	7%	7%	6%	6%	6%	6%	3%
Annual Power Supply [kW-hr]	1,289,291.96	1,132,826.76	1,172,455.82	1,212,184.89	1,252,016.76	1,291,954.22	1,332,000.05	1,372,157.00	1,412,427.83	1,452,815.27	1,493,322.04
Basic Charge	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12
Demand Charge [\$ /kW]	\$1,839.74	\$1,616.48	\$1,673.02	\$1,729.72	\$1,786.55	\$1,843.54	\$1,900.69	\$1,957.99	\$2,015.45	\$2,073.08	\$2,130.88
Energy Charge Part 1	\$3,704.69	\$5,105.60	\$5,309.36	\$6,046.76	\$5,917.05	\$6,117.56	\$6,318.57	\$6,520.13	\$6,722.23	\$6,924.89	\$7,331.74
Energy Charge Part 2	\$3,542.76	\$611.30	\$607.52	\$70.62	\$401.34	\$402.39	\$403.46	\$404.57	\$405.70	\$406.86	\$204.42
Discounts	-\$173.22	-\$142.45	-\$147.43	-\$152.42	-\$157.43	-\$162.44	-\$167.48	-\$172.52	-\$177.58	-\$182.66	-\$187.75
Monthly Minimum Charge	\$1,839.74	\$1,616.48	\$1,673.02	\$1,729.72	\$1,786.55	\$1,843.54	\$1,900.69	\$1,957.99	\$2,015.45	\$2,073.08	\$2,130.88
Minimum Energy Charge	\$7,247.45	\$5,716.90	\$5,916.89	\$6,117.38	\$6,318.40	\$6,519.94	\$6,722.04	\$6,924.69	\$7,127.92	\$7,331.74	\$7,536.16
Total Monthly	\$8,922.09	\$7,199.04	\$7,450.60	\$7,702.80	\$7,955.65	\$8,209.17	\$8,463.37	\$8,718.28	\$8,973.92	\$9,230.29	\$9,487.42
Total Yearly (before tax)	\$107,065.07	\$86,388.53	\$89,407.25	\$92,433.60	\$95,467.77	\$98,509.98	\$101,560.45	\$104,619.39	\$107,687.00	\$110,763.49	\$113,849.08

Option 3 - Powerhouse Springs + Stawamus River UV Facility

Average (2023-2041) = \$70,957.77
 NPV (discount rate = 5%) = \$828,954.25

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
ADD [L/s]	156.0	161.5	167.0	172.5	178.0	183.5	189.0	194.5	200.0	205.5	211.0
Daily Demand [ML/d]	13.5	14.0	14.4	14.9	15.4	15.9	16.3	16.8	17.3	17.8	18.2
BASELINE PHS											
Headloss [m]	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1
Total Dynamic Head [m]	45.1	45.2	45.2	45.2	45.3	45.3	45.4	45.4	45.5	45.5	45.6
Total Horsepower [HP]	86.7	89.8	92.9	96.1	99.3	102.4	105.6	108.8	112.0	115.2	118.4
UPGRADE - Stawamus River WTP											
UV Facility (kW)	19.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.22
Power usage by pumps [kW]	83.6	87.0	89.3	91.7	94.0	96.4	98.7	101.1	103.5	105.9	108.5
Daily Power Usage [kW-hr/d]	2,006.87	2,087.01	2,143.30	2,199.73	2,256.32	2,313.07	2,369.97	2,427.04	2,484.28	2,541.69	2,604.62
Monthly Power Usage [kW-hr/month]	60,206.13	62,610.39	64,298.99	65,992.04	67,689.67	69,392.00	71,099.16	72,811.27	74,528.45	76,250.83	78,138.51
Baseline [kW-hr/month]	59,794.75	60,000.44	60,870.42	62,371.84	64,300.48	65,993.57	67,691.24	69,393.61	71,100.81	72,812.96	76,250.83
Threshold usage above or below baseline [kW-hr/month]	11,958.95	12,000.09	12,174.08	12,474.37	12,860.10	13,198.71	13,538.25	13,878.72	14,220.16	14,562.59	15,250.17
Usage Difference -Monthly to Baseline	1%	4%	6%	6%	5%	5%	5%	5%	5%	5%	2%
Annual Power Supply [kW-hr]	732,507.86	761,759.79	782,304.39	802,903.17	823,557.67	844,269.39	865,039.82	885,870.47	906,762.83	927,718.38	950,685.26
Basic Charge	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12
Demand Charge [\$ /kW]	\$1,045.25	\$1,086.99	\$1,116.30	\$1,145.70	\$1,175.17	\$1,204.72	\$1,234.36	\$1,264.08	\$1,293.90	\$1,323.80	\$1,356.57
Energy Charge Part 1	\$3,671.40	\$3,684.03	\$3,737.44	\$3,829.63	\$3,948.05	\$4,052.01	\$4,156.24	\$4,260.77	\$4,365.59	\$4,470.72	\$4,681.80
Energy Charge Part 2	\$25.26	\$160.25	\$210.51	\$222.28	\$208.10	\$208.66	\$209.25	\$209.84	\$210.46	\$211.08	\$115.90
Discounts	-\$92.16	-\$95.83	-\$98.41	-\$101.00	-\$103.59	-\$106.20	-\$108.81	-\$111.42	-\$114.05	-\$116.68	-\$119.57
Monthly Minimum Charge	\$1,045.25	\$1,086.99	\$1,116.30	\$1,145.70	\$1,175.17	\$1,204.72	\$1,234.36	\$1,264.08	\$1,293.90	\$1,323.80	\$1,356.57
Minimum Energy Charge	\$3,696.66	\$3,844.28	\$3,947.96	\$4,051.91	\$4,156.15	\$4,260.67	\$4,365.49	\$4,470.61	\$4,576.05	\$4,681.80	\$4,797.70
Total Monthly	\$4,657.87	\$4,843.56	\$4,973.97	\$5,104.73	\$5,235.84	\$5,367.32	\$5,499.17	\$5,631.40	\$5,764.02	\$5,897.04	\$6,042.83
Total Yearly (before tax)	\$55,894.44	\$58,122.69	\$59,687.67	\$61,256.77	\$62,830.11	\$64,407.82	\$65,990.00	\$67,576.76	\$69,168.22	\$70,764.50	\$72,513.99

Assumptions

- *No inflation; all rates in 2023 dollars
- *Assumed after upgrade year that 1 quarter of ADD is provided by additional source, whichever it is. 2023 is the year forecasted MDD exceeds PHS current practical output capacity of 255 L/s
- *Assumed no added annual costs to power for additional facilities at Mamquam Well Field or Stawamus River intake, only additional pumping for MMWF, and no additional pumping for Stawamus River WTP
- *Power cost for UV Facility based on power consumption estimate from UV system manufacturer and previous project experience.
- *Baseline calculations based on BC Hydro "Electric Tariff" document, last updated April 2017 with ENR multiplier applied (still to apply once demand rates confirmed)
- *Assumed all discounts applicable

APPENDIX

B

WATER

CONSERVATION

PLAN

DISTRICT OF SQUAMISH
REPORT NUMBER: 221-11672-00

SQUAMISH WATER CONSERVATION PLAN UPDATE

DECEMBER 06, 2024

FINAL





SQUAMISH WATER CONSERVATION PLAN UPDATE

DISTRICT OF SQUAMISH

FINAL

PROJECT NO.: 221-11672-00
DATE: DECEMBER 06, 2024

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December 06, 2024

FINAL

District of Squamish
37957 2 Avenue
Squamish, BC V8B 0A3

Attention: David Roulston, P.Eng., Senior Manager of Infrastructure Planning

Dear Sir:

Subject: 2024 Water Conservation Plan Update

WSP Canada Inc. is pleased to present the 2024 Squamish Water Conservation Plan (WCP) update. Our focus is to support the District's goal of reducing per capita water demands by 20% by 2041, in light of recent challenges including population growth, increased residential water usage, and the demands of the high-consumption Industrial, Commercial, and Institutional (ICI) sectors.

Key aspects of our update include:

- Addressing increased water demands from the growing population and new irrigation systems.
- Implementing advanced metering initiatives for more effective monitoring and management of water usage.
- Concentrating efforts on high water consumption areas, including residential properties and ICI sectors, to identify and mitigate potential leakages.
- Incorporating feedback from District staff to ensure a well-rounded and effective plan.

We are committed to working collaboratively with the District, aiming to create a plan that is not only responsive to current challenges but also adaptable for future needs.

We look forward to discussing this update with you and are open to any suggestions or clarifications you may have.

Yours truly,

Michael Levin, P.Eng., PMP
Project Manager

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REVISION HISTORY

FIRST ISSUE

August 19 th , 2024	1 st Draft Submission			
Prepared By:	Prepared By:	Approved By:		
Carlos Rodriguez	Christopher Lau	Michael Levin		
October 30 th , 2024	Final Draft Submission			
Prepared By:	Prepared By:	Approved By:		
Carlos Rodriguez	Christopher Lau	Michael Levin		
December 6 th , 2024	Final Submission			
Prepared By:	Prepared By:	Approved By:		
Carlos Rodriguez	Christopher Lau	Michael Levin		

SIGNATURES

PREPARED BY



December 6, 2024

Christopher Lau, EIT
Project Engineer

APPROVED BY



The image shows a handwritten signature of Michael Levin next to a circular professional seal. The seal contains the text: 'PROFESSIONAL ENGINEER', 'PROVINCE OF BRITISH COLUMBIA', 'M. LEVIN', and '#48883'. Below the seal, the date '2024-12-06' is printed.

December 6, 2024

Michael Levin, P.Eng., P.Eng.
Project Manager

PERMIT NUMBER: 1000200

WSP CANADA INC. 2024-12-06

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TABLE OF CONTENTS

1	EXECUTIVE SUMMARY.....	1
1.1	Summary	1
2	INTRODUCTION	2
2.1	Water Conservation and the District	2
2.1.1	Historical Context and Current Challenges.....	2
2.1.2	Increased Water Demand and Conservation Efforts.....	2
2.1.3	2024 Water Conservation Plan Update	3
2.1.4	Updated Water Conservation Target for 2041.....	3
2.2	Scope of the 2024 Update.....	4
2.3	Planning Process for the Update.....	4
3	UPDATED COMMUNITY WATER SYSTEM PROFILE	5
3.1	Background and Summary Update	5
3.1.1	Location and Climate	5
3.1.2	Water Sources and Treatment	5
3.1.3	System Infrastructure	5
3.1.4	Water Usage and Distribution.....	5
3.1.5	Technology for Improved Management	5
3.2	Updated Climate Profile	6
3.3	Revised Community Profile Considering Population Growth	6
3.4	Watershed Profile Updates.....	7
3.5	Infrastructure Profile Update.....	7
3.5.1	Groundwater Wells and Surface Water Sources.....	8
3.5.2	Distribution and Treatment Systems	8
3.5.3	Recent Developments and Future Plans	9
3.6	Analysis of Current and Historic Water Demand	9
3.6.1	System Demands	10
3.6.2	Average Day Demand.....	11
3.6.3	Maximum Day Demand	13
3.6.4	Comparison with BC Municipalities	15



4	FUTURE WATER DEMAND PROJECTIONS	17
4.1	Population Growth and Water Demand	17
4.2	Impact of Climate Change on Future Water demand and Community Resilience	18
4.2.1	The Challenge of Climate Change	18
4.2.2	Mitigative Actions	18
4.2.3	Strategic Adaptations	18
5	REVISED WATER CONSERVATION TARGET	19
5.1	Review of Previous Water Conservation Targets	19
5.2	Renewed Focus on Water Conservation	19
5.2.1	Water Conservation Goals	19
5.2.2	Revised Water Conservation Target	19
5.2.3	Monitoring and Adjusting Targets	21
6	REVIEW OF POTENTIAL WATER CONSERVATION PROGRAMS	22
6.1	Introduction to Recommended Potential Water Conservation Programs	22
6.1.1	Legal Tools and Bylaw Updates	22
6.1.2	Economic Tools: Conservation-Focused Water Rate Structure	23
6.1.3	Network and Customer Demand Tools: Metering and Leak Detection	23
6.1.4	Educational and Outreach Programs Expansion	24
6.1.5	Partnership and Collaboration Initiatives: Focusing on High-Usage Sectors	24
7	PROPOSED WATER CONSERVATION PLAN	25
7.1	Selection of New Water Conservation Programs	25
7.2	Proposed Implementation Schedule & Budget	26
7.3	Monitoring and Evaluating Demand Trends	27



7.4	Additional Recommendations and Future Directions	28
7.4.1	Potential Future Initiatives and Considerations	28

BIBLIOGRAPHY	30
---------------------	-----------

TABLES

TABLE 2-1:	PREVIOUS WATER CONSERVATION TARGET	3
TABLE 2-2:	2041 WATER CONSERVATION TARGET	3
TABLE 3-1:	SUMMARY OF CLIMATE DATA FOR THE DISTRICT OF SQUAMISH	6
TABLE 3-2:	DISTRICT OF SQUAMISH POPULATION	7
TABLE 3-3:	EXISTING SUPPLY SOURCES	8
TABLE 3-4:	ESTIMATED WATER DEMAND COMPARISON (2015 AND 2023)	10
TABLE 3-5:	2023 SECTOR-SPECIFIC DEMAND DISTRIBUTION UPDATE	11
TABLE 3-6:	AVERAGE DAY DEMAND (2015 TO 2023)	12
TABLE 3-7:	PER CAPITA DEMANDS AND PEAKING FACTORS	13
TABLE 5-1:	KEY PERFORMANCE INDICATORS:	21
TABLE 7-1:	WATER CONSERVATION PLAN PROGRAMS	25
TABLE 7-2:	WATER CONSERVATION PLAN SCHEDULE AND BUDGET	27

FIGURES

FIGURE 2-1:	WATER CONSUMPTION TRENDS FROM 2013 TO 2023	2
FIGURE 3-1:	PER CAPITA DEMAND 2013-2023	12
FIGURE 3-2:	WATER DEMAND AND CLIMATE DATA	14
FIGURE 3-3:	ABSTRACTION LIMIT AND MDD	15
FIGURE 3-4:	TRENDS IN TOTAL AND RESIDENTIAL WATER USE IN LITRES PER CAPITA PER DAY IN BC	16
FIGURE 4-1:	PROJECTED FUTURE MDD IN THE DISTRICT	17
FIGURE 5-1:	PROJECTED DISTRICT PER CAPITA ADD AND MDD WITH 20% WATER CONSUMPTION REDUCTION	20
FIGURE 5-2:	PROJECTED ADD AND MDD IN MLD WITH 20% WATER CONSUMPTION REDUCTION	20

1 EXECUTIVE SUMMARY

1.1 SUMMARY

The 2024 Squamish Water Conservation Plan Update (WCP) aims to ensure a sustainable water future in the face of population growth and climate change. It tackles an estimated 67% increase in average day demand (ADD) for multi-family residences from 2015 to 2024, which now represents 33% of the District's 2023 ADD. The plan also addresses the continued high water usage from single-family homes and institutional, commercial and industrial properties. With multi-family residential growth and long-term climate-induced supply risks, the plan focuses on the importance of water efficiency to prevent costly infrastructure investments and promote long-term water reliability. It aims to optimize aquifer use and avert expensive treatment upgrades.

This WCP sets a revised target to lower per capita water demands by 20% by 2041, a goal predicated on the implementation of several key conservation programs. These priority strategies include:

- **Revisiting Development Bylaws for Metering Expansion:** Amending development bylaws to mandate the installation of water meters for new developments and the redevelopment of existing single- and multi-family properties.
- **Leak Detection and Infrastructure Modernization:** Leveraging zone meter data for a targeted approach to leak detection as well as implementing a comprehensive 17-year AC Renewal Plan to replace a significant portion of the water distribution system.
- **Bylaw Revision and Enforcement:** Revising outdoor water use bylaws and strengthening enforcement to ensure compliance and conservation.
- **Conservation-Focused Water Rate Structure:** Implementing a single-tier water rate structure to promote water conservation and ensure fair water usage.
- **Public Education and Engagement:** Enhancing education and community outreach to foster long-term conservation awareness.
- **Sustainable Practices and Incentives:** Incorporating xeriscaping into municipal planning and offering incentives for water-efficient landscaping.
- **Strategic Partnerships and Programs:** Developing partnerships to target significant water savings in high-consumption sectors.

Once these foundational programs are established, additional initiatives such as in-depth water audits, and expanding conservation efforts to high water-use businesses may be introduced. These efforts are in response to the projected trajectory that, without intervention, maximum day demands (MDD) will exceed the production capacity of the Powerhouse Springs Wells by 2026 if current per capita demands remain the same, as evidenced in the Plan's detailed projections.

2 INTRODUCTION

2.1 WATER CONSERVATION AND THE DISTRICT

2.1.1 HISTORICAL CONTEXT AND CURRENT CHALLENGES

Traditionally, the District of Squamish has benefitted from an abundant freshwater supply, with its potable water system consistently meeting community demands without a significant need for conservation. Recently, however, the scenario has evolved due to rapid population growth, aging water infrastructure, climate change, and economic pressures. These changes require a delicate balance between expanding the system and managing costs effectively.

Figure 2-1 below, presents the water consumption trends from 2013 to 2023 which indicates a reduction in per capita water demands of approximately 18% since 2013.

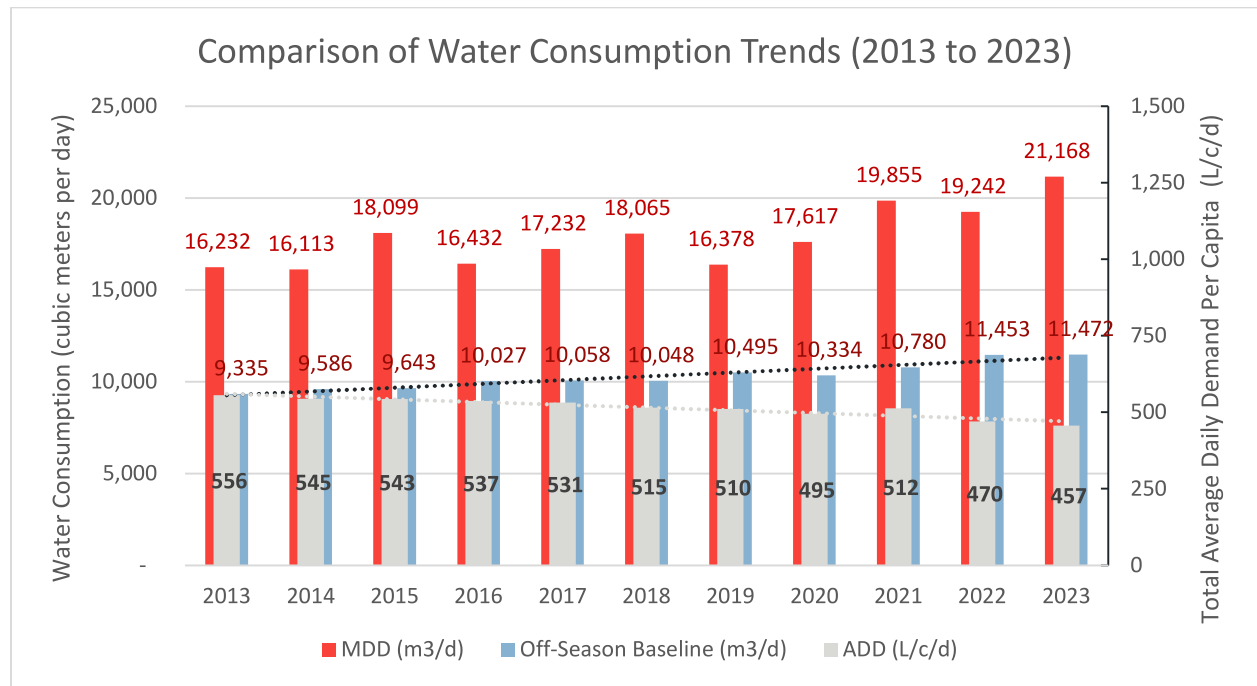


Figure 2-1: Water Consumption Trends from 2013 to 2023

2.1.2 INCREASED WATER DEMAND AND CONSERVATION EFFORTS

The increasing water demand in the District is propelled by factors such as population growth, new irrigation systems, high residential water consumption, potential system leaks, climate change, and the requirements of the Industrial, Commercial, and Institutional (ICI) sectors. The District has adopted various conservation measures to address this, including water loss management, staged water restrictions, and enhanced customer education. The initial goal, as outlined in the 2015 Water Conservation Plan (WCP), targeted a 15% reduction in water demand by 2031.

Table 2-1 below illustrate the water conservation targets set in 2015, alongside the projected and actual demands for 2023.

Table 2-1: Previous Water Conservation Target

15% REDUCTION BY 2031	BASE YEAR 2014 ¹	PROJECTED YEAR 2023	ACTUAL YEAR 2023	PROJECTED END OF YEAR 2031
ADD (L/c/d)	564	516	457	479
MDD (L/c/d)	851	779	725 ²	723

2.1.3 2024 WATER CONSERVATION PLAN UPDATE

The 2024 WCP update introduces a comprehensive and proactive strategy to address these emerging challenges. It aims to effectively influence system demands while considering the potential impacts of climate change and growing environmental consciousness. This updated plan sets forth a new direction, striving to meet current and future water demands and initiating a shift in the community’s perception and practices regarding water use.

Key strategies in the updated plan include enhanced metering systems, modernized leak detection techniques, bylaw revisions, infrastructure improvements, and the implementation of conservation-focused rate structures. These initiatives demonstrate a strong commitment to the long-term sustainability and efficient management of the District’s water resources.

2.1.4 UPDATED WATER CONSERVATION TARGET FOR 2041

We have set a 20% water consumption reduction target for 2041, detailed in Table 2-2 and further discussed in Section 5. This target is based on comprehensive data and reports presented further below:

Table 2-2: 2041 Water Conservation Target

20% REDUCTION BY 2041	BASE YEAR 2023	END OF YEAR 2041
ADD (L/c/d)	457	366
MDD (L/c/d)	725	580 ^a

a. MDD has a linear relationship with the associated peaking factor. It was assumed that it remains constant at 1.5 as shown by the data presented in Section 3.6 of this WCP.

- **The Metro Vancouver (MV) 2021 Water Consumption Statistics Report³:** Indicates a 24% per capita demand reduction from 2007-2021 due to effective programs/initiatives and an increase in multi-family housing contributing to lower outdoor water usage. Considering similar efforts in expanding metering and refining initiatives based on this WCP’s recommendations as well as the increase in multi-family housing within the District, we believe that a 20% reduction is feasible for the District over the next 16 years.
- **Living WaterSmart – British Columbia’s Water Plan⁴:** The document does not set a specific target but shows a potential 20-50% reduction in overall water demands. Given the current infrastructure, public education efforts, and the success of past initiatives to be refined with trends observed in consumption data; as well as challenges such as staff resourcing, rapid population growth rate, and continued assessment of distribution

¹ Values obtained from 2015 WCP.

² Value calculated using a peaking factor of 1.5 as per the other provided values. The peaking factor indicates the relationship between Average Daily Demand and Maximum Daily Demand.

³ MV’s 2021 Water Consumption Statistics Report - <https://metrovancover.org/services/water/Documents/water-consumption-statistics-report-2021.pdf>

⁴ https://waterbucket.ca/wcp/wp-content/uploads/sites/6/2017/11/livingwatersmart_book.pdf

system losses, we consider that a 20% reduction goal is a balanced and realistic goal that aligns with the broader potential identified in this WCP.

2.2 SCOPE OF THE 2024 UPDATE

This updated report provides a review and strategic update of water conservation in the District of Squamish for 2024. The updated scope includes:

- **Section 3 – Updated Community Water System Profile:** Presents an updated profile of the District’s water utility, encompassing current and historic water use, infrastructure changes, and impacts of community growth.
 - **Section 4 – Future Water Demand Projections:** Describes projections for future water demand, considering potential effects of climate change and population growth.
 - **Section 5 – Revised Water Conservation Target:** Reviews goals from the previous conservation efforts and outlines updated targets for the next phase of the District’s WCP.
 - **Section 6 – Review of Water Conservation Efforts:** Assesses past and current water conservation programs in the District, evaluating their effectiveness and areas for improvement.
 - **Section 7 – Evaluation of Potential Future Water Conservation Programs:** Discusses potential future water conservation strategies, focusing on effectiveness, ease of implementation, and cost-benefit analysis.
 - **Section 8 - Recommendations for Water Conservation Programs:** Provides detailed recommendations on water conservation programs to be implemented, including timelines and associated costs to meet the updated conservation targets.
 - **Section 9 – Recommendations for Future Data Collection and Plan Updates:** Offers guidance on data collection and methodologies for future updates to the Water Conservation Plan, facilitating adaptability and continuous improvement.
-

2.3 PLANNING PROCESS FOR THE UPDATE

This WCP was developed in alignment with the District's key documents, including the Official Community Plan, Water Loss Management Program, Water Master Plan, and Asset Management Plan. It also incorporates the Outdoor Water Use Bylaw (No.2254) and its 2014 amendments (bylaw No. 2325).

Guidance for the WCP came from the "Water Conservation Planning Guide for British Columbia’s Communities," the Ministry of Environment’s Living Water Smart: British Columbia’s Water Plan (2008), and the M52 AWWA - Water Conservation Programs - A Planning Manual (2017). These sources provided insights and methodologies relevant to the update.

Ongoing dialogue with the District informed the assessment of previous initiatives and helped shape future strategies to address current water demands. This collaborative approach aligns the WCP with both existing and emerging frameworks, promoting unified and effective water conservation in the District.

3 UPDATED COMMUNITY WATER SYSTEM PROFILE

3.1 BACKGROUND AND SUMMARY UPDATE

3.1.1 LOCATION AND CLIMATE

The District of Squamish, situated in southwest British Columbia, is located at the confluence of the Squamish River and Howe Sound. The region is characterized by warm, dry summers and cool, rainy winters.

3.1.2 WATER SOURCES AND TREATMENT

The District's primary water supply comes from groundwater sources, chiefly from the Powerhouse Springs well site. In cases of emergency or increased demand, supplemental water can be sourced from two surface water bodies: Mashiter Creek and the Stawamus River, although this has not occurred in the last 10 years. When these surface sources have been utilized in the past, a boil water advisory was issued when turbidity levels exceeded the recommended thresholds. However, these surface sources now require a boil water advisory regardless of turbidity levels due to more recent stringent standards from Vancouver Coastal Health. All water, regardless of its source, currently undergoes either primary or secondary chlorine disinfection to meet quality and safety standards.

3.1.3 SYSTEM INFRASTRUCTURE

The water system is comprised of the following components as of the latest 2022 Drinking Water Quality Annual Report:

- **Reservoirs:** 7 operational reservoirs.
 - **Pressure Reducing Valves (PRVs):** 35 active PRV stations.
 - **Pump Stations:** 4 stations facilitating water distribution.
 - **Fire Hydrants:** A total of 650 across the District.
 - **Service Connections:** 8,700 connections to cater to diverse needs.
 - **Watermains:** An extensive network covering 146 kilometres.
-

3.1.4 WATER USAGE AND DISTRIBUTION

In 2023, the District supplied 4.93 million cubic metres of potable water. The Average Daily Demand (ADD) was 13.5 MLD, with the Maximum Daily Demand (MDD) reaching 21.2 MLD. The water system services approximately 29,206 residents, nearly 800 industrial, commercial, and institutional (ICI) customers, and five First Nations Reserves.

3.1.5 TECHNOLOGY FOR IMPROVED MANAGEMENT

Integration and improvements made to the Supervisory Control and Data Acquisition (SCADA) system has significantly advanced the efficiency and responsiveness of the District's water management. This system continually monitors and manages the water distribution process.

3.2 UPDATED CLIMATE PROFILE

The District of Squamish generally experiences warm summers from May to September (peak water consumption season) and cool winters from October to April (low water consumption season). The water demand, particularly on the maximum day, shows a close correlation with climatic factors, most notably during prolonged hot and dry summer periods. The updated climate data from 2015 to 2022, as summarized in Table 3-1, includes key metrics such as average daily maximum temperature, total precipitation, maximum daily summer temperature, and the number of summer days without rain. This data provides insights into the climatic trends affecting Squamish.

Table 3-1: Summary of Climate Data for the District of Squamish

YEAR	AVERAGE DAILY MAXIMUM TEMPERATURE (°C)		TOTAL PRECIPITATION (MM)		MAXIMUM DAILY SUMMER TEMPERATURE (°C)	PEAK SEASON – NUMBER OF DAYS WITHOUT RAIN
	Peak Season	Low Season	Peak Season	Low Season		
2015	24	10	429	1964	37	105
2016	23	9	198	2206	37	104
2017	23	8	196	2142	38	117
2018	23	9	404	1964	35	102
2019	22	10	398	1264	32	100
2020	22	9	526	1775	34	89
2021	23	8	470	2105	43	99
2022	23	9	293	1488	37	92

Key observations from the data include:

- The average daily maximum temperature during summer has consistently been around 23°C, with 2021 experiencing the highest recorded maximum daily summer temperature at 43°C.
- Total precipitation during winter is notably higher than in summer, with 2016, 2017, and 2021 being particularly wet winters.
- The number of days without rain in the summer has varied, with 2017 experiencing the highest number of dry days at 117. The year 2022 saw a decrease in dry days, with only 92 days without rain.
- On certain days, maximum daily temperatures have soared, indicating instances of extreme heat. For example, in 2021, the maximum daily summer temperature reached 43°C.

This updated analysis confirms Squamish’s long periods without rainfall during summer, which aligns with the observed increase in water demands during these periods. The detailed review of daily temperature records over these years highlights several days where the maximum temperature exceeded 30°C, highlighting the need for effective water conservation strategies during these peak demand periods.

3.3 REVISED COMMUNITY PROFILE CONSIDERING POPULATION GROWTH

Based on the previous Water Conservation Plan (WCP) and Census data from the Government of Canada, the District of Squamish has seen significant growth in its population. This growth is detailed in Table 3-2, showing

changes in population across various census years. The table also includes the population count for 2023, based on the latest estimate from Statistics Canada.

Table 3-2: District of Squamish Population

CENSUS YEAR	POPULATION	CHANGE IN POPULATION (%)
1996	13,994	-
2001	14,248	+1.8
2006	14,949	+4.9
2011	17,674	+14.8
2016	20,910	+18.3
2021	23,819	+13.9
2023	29,206	+5.7

The District's population increased from 13,994 in 1996 to 29,206 in 2023, highlighting the area's growing appeal and economic expansion. Key ICI water users include breweries, hospitals, municipal pools, and a wastewater treatment plant. The significant growth, especially from 2011 to 2023, underscores rising water demands, highlighting the importance of sustainable water management.

Given this upward trajectory in population, the District continues to prioritize effective water conservation strategies and infrastructure development to meet future needs.

3.4 WATERSHED PROFILE UPDATES

The District has an ideal raw water source that provides potable groundwater that requires no treatment. Water is disinfected to protect the distribution network. This type of situation is increasingly rare but leads to water treatment cost savings that accumulate through the careful protection of water sources and upland watersheds.

The aquifer supplying this groundwater is unconfined. The District's Well Protection Plan indicates that the primary sources of water recharge are from seepage from Ring and Skookum Creeks (around 69%) with additional infiltration through the Lava flow overlying the aquifer making up the remaining 31%.

3.5 INFRASTRUCTURE PROFILE UPDATE

Reflecting on the 2015 Water Conservation Plan, the District of Squamish has preserved its essential water infrastructure components, while making strategic advancements to support the community's growth. This section provides an overview of the current infrastructure and outlines the direction for future developments. Table 3-3 summarizes the capacities of the groundwater and surface water systems.

Table 3-3: Existing Supply Sources

WELLFIELD OR WATER SOURCE	ABSTRACTION LIMIT (L/S)
Powerhouse Springs Wells ^a	255
Mashiter Creek ^b	184
Stawamus Creek ^b	132

a. The District has an Environmental Assessment certificate for abstraction of up to 255 L/s at Powerhouse Springs.

b. The listed Maximum Daily Diversion Volume from each source as noted by the BC Water License held by the District.

3.5.1 GROUNDWATER WELLS AND SURFACE WATER SOURCES

Ensuring a reliable water supply involves balancing the groundwater well capacities with the need for emergency surface water sources.

- **Groundwater Wells:** The primary source of Squamish's water comes from seven groundwater wells near Powerhouse Creek and the Mamquam River. Governed by a Project Approval Certificate from 1998, these wells have a combined maximum abstraction limit⁵ of 255 liters per second (L/s). However, the system's design means that operating all wells simultaneously can lead to increased pressures, restricting actual water withdrawal to about 250 L/s or 21.6 million litres per day (MLD).
- **Surface Water Sources and Turbidity Issues:** The Mashiter Creek and Stawamus River, serving as emergency backups, present challenges with high turbidity, especially during summer. Turbidity levels can surge during heavy rains, necessitating water quality advisories. Historically, these sources have a combined licensed capacity of 316 L/s, but their usage is often limited in summer due to turbidity and microbiological concerns as well as the need to maintain adequate flows in the Stawamus River.
- **Operational Constraints and Environmental Management:** While the technical abstraction capacity of the wells is high, actual extraction is carefully managed to balance demand with environmental sustainability. For instance, during periods of high demand in summer, reliance on the Powerhouse Springs Wells is maximized, but operational constraints such as system pressures and turbidity in surface sources can limit water availability.

3.5.2 DISTRIBUTION AND TREATMENT SYSTEMS

The District has continued their efforts to expand the distribution network to accommodate the growing community, while maintaining high water quality.

System Expansion and Modernization

- As of 2022, the water distribution network has seen significant expansion, now comprising 23 Pressure Reducing Valve (PRV) stations, 4 pump stations, 650 fire hydrants, and 167 km of watermain. These enhancements have increased the network's capacity and reliability, serving 8,700 connections.
- A major development in system management is the upgrade to the SCADA system. This technology plays a crucial role in real-time monitoring and managing of the water distribution system, allowing for more efficient operations and rapid response to any issues in the network.

⁵ Maximum amount of water that is legally allowed to be extracted from a specific source, such as a river, lake, or aquifer, over a set period of time. This limit is often set by regulatory bodies to ensure sustainable use of water resources and to protect the environment.

Water Quality Assurance

- To ensure compliance with the Drinking Water Protection Regulation (B.C. Reg. 352/2005), the District collects and analyzes a minimum of 20 bacteriological samples per month from various points in the distribution system.
- Continuous monitoring of physical and chemical parameters is conducted, providing an ongoing assessment of water quality, and ensuring it meets the highest safety standards.
- A well protection plan is actively maintained, safeguarding primary water sources from potential contaminants and environmental factors.

Cross-Connection Control and System Maintenance

- The District places high importance on preventing the contamination of the water supply. A comprehensive cross-connection control program is in place, ensuring the proper installation and maintenance of backflow prevention assemblies.
- An annual flushing program is conducted to remove aged or stagnant water from the system, thereby maintaining the freshness and quality of the water supplied to consumers.
- The SCADA system's online monitors are integral in overseeing these processes, providing alerts and data that help maintain the integrity and safety of the water distribution system.

3.5.3 RECENT DEVELOPMENTS AND FUTURE PLANS

This section outlines the recent developments in the District's water infrastructure and highlights the strategic plans aimed and proposed at enhancing water conservation and system efficiency for this 2024 WCP update from an infrastructure enhancement perspective.

Recent Infrastructure Developments

- **Watermain Replacement:** A significant upcoming project, planned from 2024 to 2041, involves replacing the District's watermains. This extensive initiative, with an estimated cost of \$43.6 million, aims to replace 26 km of watermains. This project aims to modernize the water distribution network and ensure its reliability for the future.

Future Infrastructure and Conservation Projects Proposed for this 2024 WCP Update

- **Water Reclamation at the Wastewater Treatment Plant (WWTP):** The District is exploring the potential implementation of a water reclamation system for the WWTP. This system would play a role in water conservation efforts, helping to reduce overall water demands and contribute to environmental sustainability.
- **Metering Expansion:** New programs for meter installation for new developments and the redevelopment of existing single- and multi-family properties will help the District manage water usage more effectively.
- **Sustainable Practices:** Initiatives like promoting xeriscaping in landscaping will be encouraged to reduce irrigation demands and foster sustainable water use.
- **Strategic Partnerships:** The District plans to support high-consumption businesses (such as breweries) with water audits and potentially metering, helping them identify and implement water-saving measures.

Environmental and Sustainability Goals:

- **Reduction of Water Demands:** The District is adjusting its focus on reducing current water demands by 20% by 2041. This objective is central to the planning and execution of all water management initiatives.

3.6 ANALYSIS OF CURRENT AND HISTORIC WATER DEMAND

An examination of the water system data for the District's water utility from 2015 to 2023 has been conducted to assess the current annual ADD and MDD on a total per capita basis. The analysis of this period, following the 2015 WCP, is essential in understanding trends and shifts in water usage within the community. The District provided

population totals for the years 2016 to 2021, while Statistics Canada supplied the data for 2022 and 2023. Based on the analysis, the data indicates that the District’s water consumption patterns are showing a decreasing trend, with 2023 ADD per capita at 457 L/c/d and 2023 MDD per capita at 725 L/c/d.

3.6.1 SYSTEM DEMANDS

3.6.1.1 CUSTOMER WATER DEMANDS

Since 2015, the District has significantly expanded its water metering infrastructure, now covering the majority of ICI properties. This expansion is foundational for establishing a robust and reliable monitoring network, essential for the precision management of water resources. Approximately 70 ICI properties remain unmetered. For a detailed view of water usage across customer groups, WSP has conducted a thorough analysis, aiming to model water consumption accurately. This initiative not only informs the implementation of targeted water-saving measures but also improves leakage detection and management – an important aspect of the District’s commitment to reduce water waste. The analysis takes into account distribution system losses, highlighting the importance of implementing a reliable leakage detection system to address leaks throughout the system to reduce water waste and enhance system efficiency.

3.6.1.2 WATER DEMAND INCREASE ANALYSIS

Table 3-4 and Table 3-5 presents the growth in ADD and MDD from 2015 to 2023, broken down by customer group. The 2015 demand estimations are sourced from the 2015 WMP based on meter data and paper records, while the 2023 demand figures are derived from the District’s more recent SCADA production data.

Table 3-4: Estimated Water Demand Comparison (2015 and 2023)

DEMAND TYPE	DEMAND (L/S) IN 2015		DEMAND (L/S) IN 2023		ADD INCREASE PER SECTOR
	ADD	MDD	ADD	MDD	
Single-Family	46.3	89.9	52.8	98.1	14%
Multi-Family	30.9	46.3	51.7	82.8	67%
Institutional	11.6	12.8	13.7	15.3	18%
Commercial	16.2	17.8	17.5	20.0	8%
Industrial	18.9	20.8	20.6	29.0	9%
TOTAL	124	188	156	245	26%

Table 3-5: 2023 Sector-Specific Demand Distribution Update

DEMAND TYPE	DEMAND (L/S)		PEAKING FACTORS		% OF 2023 ADD	DISTRIBUTION CHANGE SINCE 2015
	ADD	MDD	ADD	MDD		
Single-Family	52.8	98.1	1.0	1.9	34%	- 3%
Multi-Family	51.7	82.8	1.0	1.6	33%	+8%
Institutional	13.7	15.3	1.0	1.1	11%	+2%
Commercial	17.5	20.0	1.0	1.1	11%	-2%
Industrial	20.6	29.0	1.0	1.4	13%	-2%
TOTAL	156	245	1.0	1.3	-	-

Both tables reveal significant increases in water demand from 2015 to 2023, with the most notable rise seen in the multi-family sector (67%). This trend stresses the need for continued and improved conservation efforts. The data suggest that despite previous initiatives, there is a pressing need to apply targeted measures to curb the increasing trend in water consumption.

Both tables also quantify the change and serve as a directive for where conservation efforts should be concentrated. For example, the increase in the multi-family sector demand and an already high demand exerted by the single-family sector indicates a potential area for targeted conservation programs.

3.6.1.3 IMPLICATIONS FOR CONSERVATION STRATEGIES

The insights gained from the expanded metering network and the subsequent data analysis were invaluable for the 2024 WCP. These findings informed the selection of conservation programs, with the aim that efforts are both strategic and effective. The data-driven approach adopted by the District provides a firm foundation for addressing both current and future water demands. It also emphasizes the significance of adapting to changing usage patterns, which is crucial for meeting the District’s long-term conservation goals.

3.6.2 AVERAGE DAY DEMAND

3.6.2.1 OVERVIEW OF ADD

The ADD is an essential metric in the District’s water resource management, representing the mean volume of water distributed daily across the year. It forms the basis for assessing the required capacity of the source to meet the entire District’s water needs. ADD is used for analyzing historical consumption patterns and projecting future water demands.

3.6.2.2 PER CAPITA DEMAND

Per capita demand, expressed in litres per capita per day (L/c/d), is derived by dividing the total distributed water volume by the serviced population. It’s a general performance metric for water usage that includes non-residential consumption by ICI customers and losses through distribution network leaks.

3.6.2.3 DATA COMPILATION AND ANALYSIS

The data covering total system demand from 2015 to 2023 was obtained from the District’s SCADA monitoring systems. Since the 2023 data was not yet finalized at the time of this report, it was estimated using known population data and per capita demand. These estimates, detailed in Table 3-6, illustrate the evolution of ADD and demographic changes within the District. As previously mentioned, population data from 2015 to 2021 was provided by the District, while the 2022 and 2023 figures were sourced from Statistics Canada.

Table 3-6: Average Day Demand (2015 to 2023)

YEAR	POPULATION	TOTAL SYSTEM DEMAND (ML)	AVERAGE DAY DEMAND (MLD)	PER CAPITA DEMAND (L/C/D)
2015	20,212	4,008	11.0	543
2016	20,910	4,113	11.3	537
2017	21,528	4,176	11.4	531
2018	22,126	4,162	11.4	515
2019	22,778	4,244	11.6	510
2020	22,778	4,231	11.6	495
2021	23,819	4,467	12.2	512
2022	27,633	4,744	13.0	470
2023	29,206	4,926	13.5	457

Based on this data, there has been a 16% decrease in per capita ADD since 2015. This indicates that the District’s 2015 goal of achieving a 15% reduction in per capita water demand by 2031 has already been met despite population growth, an increase in multi-family housing, warm summers, and potential distribution system inefficiencies.

Likely, a significant contributing factor to the reduced per capita ADD is the predominance of new multi-family residential housing, which typically has much lower outdoor water usage. This trend is expected to continue, with most future growth projected as infill development and minimal new single-family residential construction.

3.6.2.4 DEMAND TRENDS

Figure 3-1 graphically illustrates the ADD per capita demand trends and seasonal variations from 2013 to 2023.

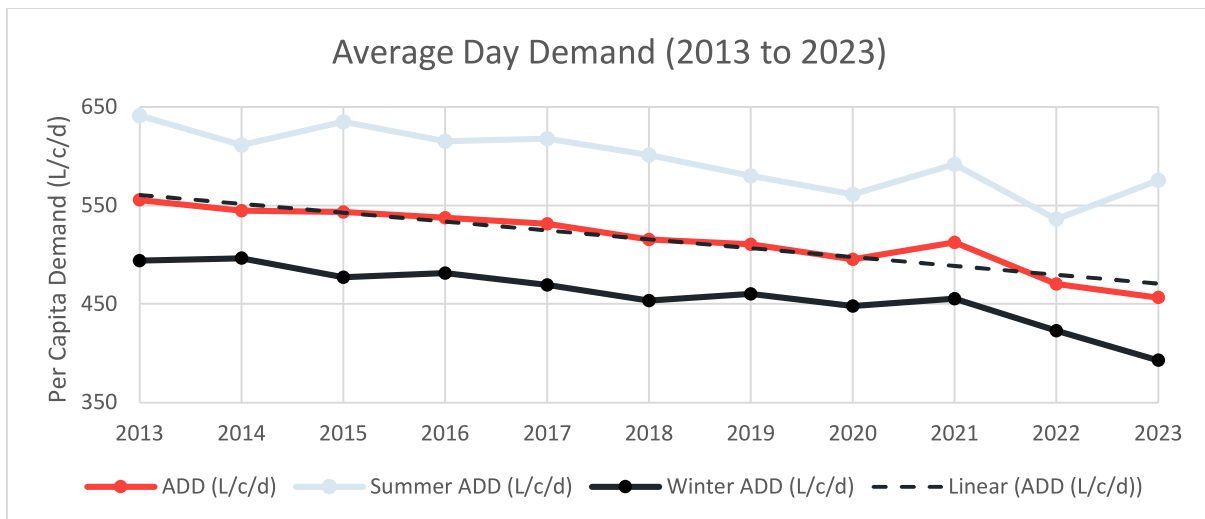


Figure 3-1: Per Capita Demand 2013-2023

3.6.2.5 CONSERVATION IMPLICATIONS

To meet the new 2041 goal of a 20% reduction in water demand, the District should consider enhancing its conservation strategy. This could include a targeted leak detection and repair program, which could significantly reduce non-revenue water and conserve resources while reducing distribution system pressures enabling water supply closer to the abstraction limit of 255 L/s. Additionally, water-saving practices should be promoted through community engagement and education initiatives. Investments in water-efficient infrastructure and incentives for residents and businesses to adopt water-saving technologies are additional options for the future. These and other supportive measures are further discussed in Section 7 of the WCP, which outlines a sustainable approach to water use that accommodates the District’s growth while preserving its environmental resources.

3.6.3 MAXIMUM DAY DEMAND

3.6.3.1 DEFINITION AND IMPORTANCE

MDD is the highest level of water consumption experienced on a single day within a year. Determining the MDD sets the capacity benchmarks for the District’s water supply/treatment facilities and dictates the size of reservoirs needed to maintain adequate reserves for fire fighting, equalization, and emergencies.

3.6.3.2 DATA COMPILATION AND ANALYSIS

Similar to the ADD analysis, demand and population data from the District’s SCADA system was utilized to generate MDD per capita values from 2015 to 2023. These MDD values are tabulated in Table 3-7, along with ADD values and calculated peaking factors.

Table 3-7: Per Capita Demands and Peaking Factors

YEAR	POPULATION	AVERAGE DAY PER CAPITA DEMAND (L/C/D)	MAXIMUM DAY PER CAPITA DEMAND (L/C/D)	PEAKING FACTOR
2015	20,212	543	895	1.6
2016	20,910	537	786	1.5
2017	21,528	531	800	1.5
2018	22,126	515	817	1.6
2019	22,778	510	719	1.4
2020	22,778	495	755	1.5
2021	23,819	512	834	1.6
2022	27,633	470	696	1.5
2023	29,206	457	725	1.0
AVERAGE	-	508	781	1.5
MEDIAN	-	512	786	1.6

3.6.3.3 PEAKING FACTORS AND IMPLICATIONS

The average and median peaking factors have consistently remained around 1.5, indicating a stable ratio between ADD and MDD. This steadiness is indicative of the District’s effective water management strategies, which may include infrastructure upgrades and conservation measures implemented since the last WCP in 2015. Such efforts appear to have successfully anticipated and met peak water demands, reflecting the District’s proactive approach to reducing water consumption and improving system oversight.

Continued monitoring of these peaking factors is essential, especially as the District’s population grows and new water conservation initiatives take effect. By closely observing these trends, the District can refine its planning processes, ensuring that infrastructure and policies are aligned with the evolving demand patterns. This continuous monitoring will also facilitate targeted actions in sectors where conservation efforts can yield the most significant results, thereby optimizing resource use and maintaining system efficiency.

3.6.3.4 DATA ANALYSIS

As shown in Figure 3-3 on the following page, the historical and current MDD remains slightly below the abstraction limit at Powerhouse Springs, suggesting that supply capacity is currently adequate. However, this highlights the need for continuous improvement in the distribution infrastructure to accommodate potential increases in peak demand.

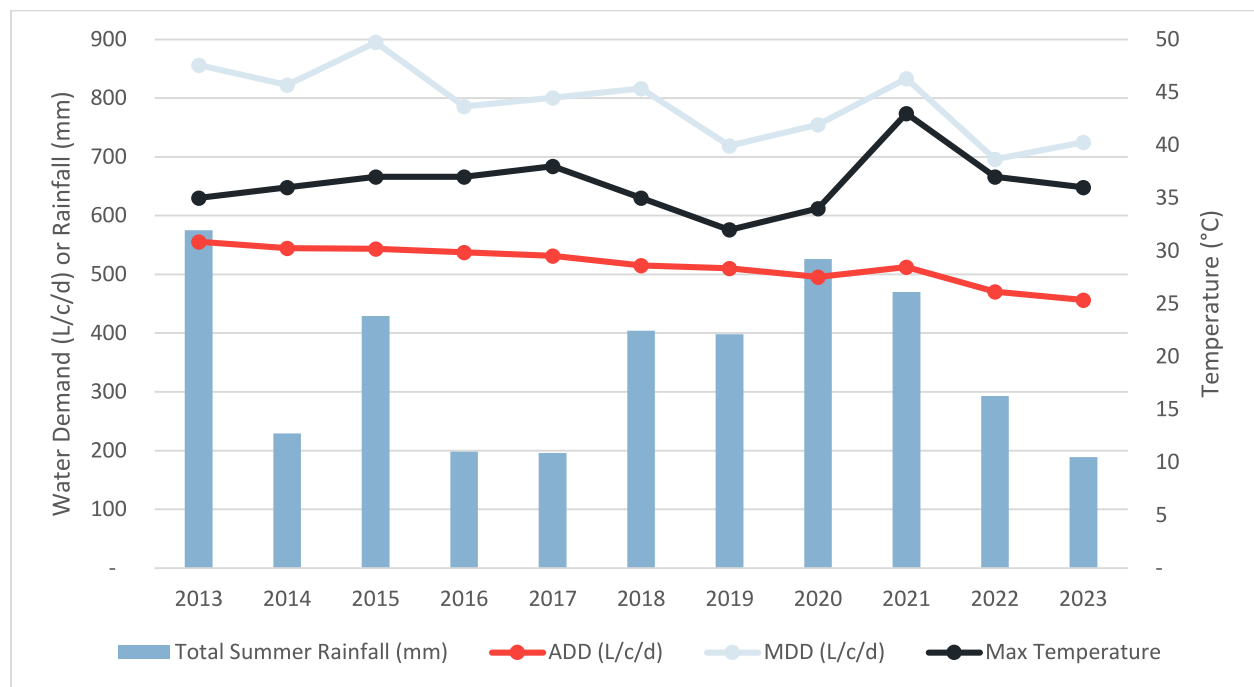


Figure 3-2: Water Demand and Climate Data

An analysis of Figure 3-2 shows an overall decline in both ADD and MDD, with a notable year-on-year decrease in ADD starting from 2021.

3.6.3.5 INFRASTRUCTURE CONSIDERATIONS

The historical MDD data, compared with the abstraction limit at Powerhouse Springs showcased in Figure 3-3, indicates that MDD values are just slightly below the threshold. Additionally, from a sustainability perspective, the climatic changes and the potential for detrimental impacts on the aquifer yield encourage changes that promote system efficiency to mitigate changes with the potential to affect aquifer yield in the future.

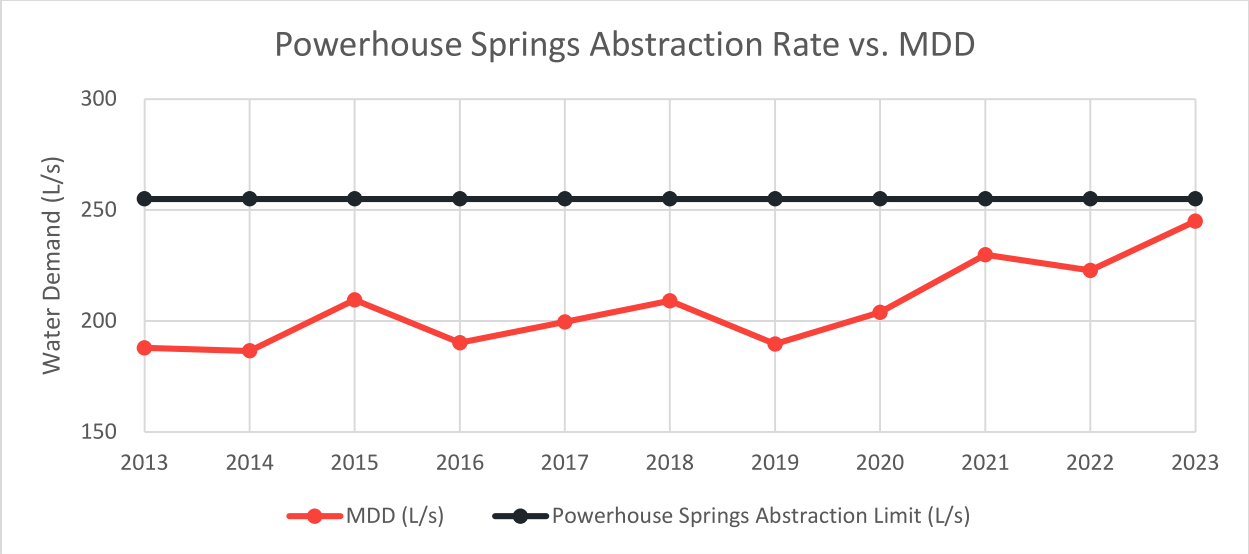


Figure 3-3: Abstraction Limit and MDD

Future MDD is anticipated to keep rising, making it crucial to continuously assess and improve the distribution network. Investigating non-climatic influences on water demand, such as demographic changes and consumption patterns, is also vital. Such analyses will ensure the water system’s resilience against both average and peak demands, supporting the District’s sustainability and conservation goals.

3.6.4 COMPARISON WITH BC MUNICIPALITIES

3.6.4.1 2016 BC WATER SURVEY

The District’s water demand has been benchmarked against other municipalities in BC, using the comprehensive data from the 2016 BC Municipal Water Survey by the University of British Columbia’s School of Community and Regional Planning. This study encompasses information from 45 municipalities, which represent two-thirds of the province’s population and about one-third of its local governments.

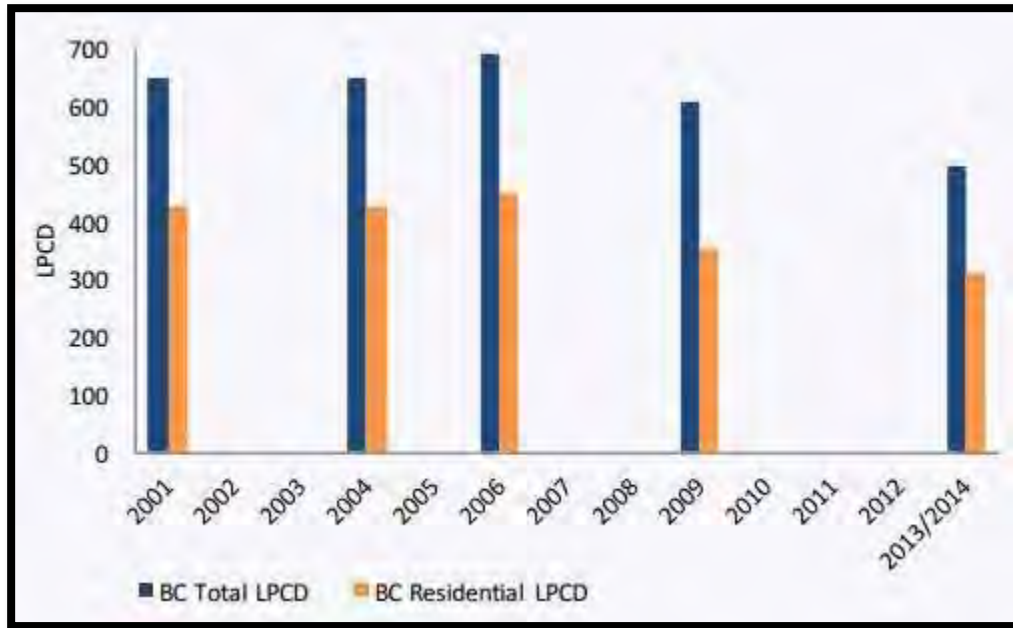


Figure 3-4: Trends in total and residential water use in litres per capita per day in BC⁶

Key findings from the study highlighted:

- The BC average for total per capita water demand was estimated at 494 lpcd.
- For residential water demand, the BC average was 312 lpcd.
- A majority of municipal governments, 66%, favored a flat-rate fee structure, with the remainder using a volume-based rate structure, typically employing a constant unit charge.
- Common water conservation programs included educational campaigns (80%), mandatory restrictions (73%), and active leak-detection programs (58%).
- Less common were initiatives like residential water reuse, seasonal water pricing, and ICI sector-specific water reuse programs.

3.6.4.2 RELEVANCE TO THE DISTRICT OF SQUAMISH

In relation to the 2016 BC Water Survey:

- The District’s average total per capita demand stands at 457 lpcd, about 7% below the BC average.
- For summer ADD, the District’s estimate of 706 lpcd is significantly higher, at 42% above the BC overall average.
- The WCP’s proposed initiatives draw from a blend of strategies used across BC, enhanced with tailored recommendations informed by data analysis, stakeholder discussions, and best practices from the AWWA M52 Manual.
- With the proposed expansion of infrastructure improvements and new conservation programs, the District is poised to improve water-use efficiency. This proactive approach will support the growing population, aligning with a conservative projected annual growth rate of 4%.

⁶ Figure obtained from the BC Municipal Water Survey 2016 - <https://waterplanninglab.sites.olt.ubc.ca/files/2016/03/BC-Municipal-Water-Survey-2016.pdf>

4 FUTURE WATER DEMAND PROJECTIONS

4.1 POPULATION GROWTH AND WATER DEMAND

In the District, future water use is closely tied to population growth and ICI sector expansion. Using a 4.0% annual compounded growth rate, discussions with the District project Squamish’s population to reach 60,400 by 2041, employing a conservative estimation approach. Assuming the 2023 ADD per capita demand of 457 litres remains unchanged, MDD is expected to increase from 245 L/s to 479 L/s in 2041, solely based on population increase. The projection also accounts for growth in SF, MF, and ICI customer groups, as delineated in the current traffic zone maps.

The projected MDD for 2041 surpasses the production capacity at Powerhouse Springs, suggesting that without intervention, demand will exceed supply. Figure 4-1 illustrates this potential trajectory, highlighting the need for proactive management.

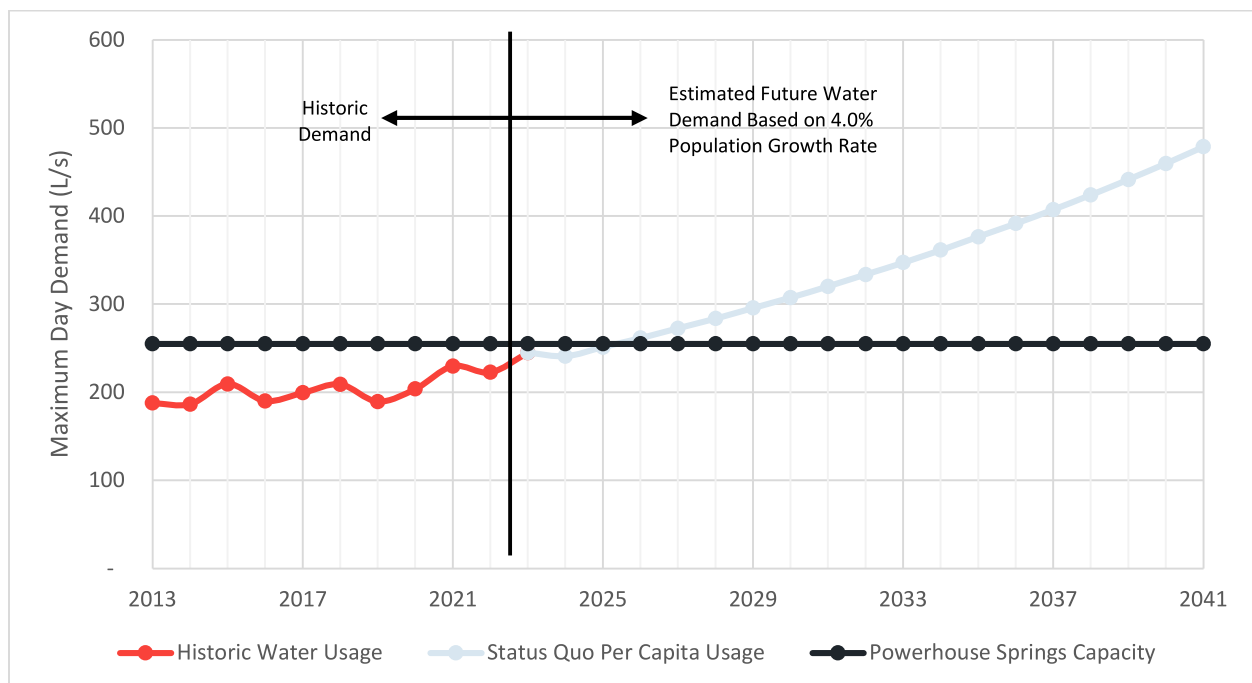


Figure 4-1: Projected Future MDD in the District

These projections suggest that the wellfield capacity could be reached by 2026 if per capita water demands continue at the current rate. It’s important to note that these forecasts do not factor in any new water-saving initiatives, efficiency improvements to the system, the addition of new wells at existing well fields or the development of new well fields in the District. However, due to the current high operating pressures in the distribution system, reducing water losses would allow the system to perform more efficiently, drawing projected volumes closer to the current abstraction limit.

To prevent surpassing the wellfield capacity and to avoid expensive treatment and distribution system upgrades, the District is focusing on demand reduction initiatives. Targeting a 20% reduction in water demand by 2041 is a strategic approach to ensuring the sustainability of the community’s water resources.

4.2 IMPACT OF CLIMATE CHANGE ON FUTURE WATER DEMAND AND COMMUNITY RESILIENCE

4.2.1 THE CHALLENGE OF CLIMATE CHANGE

In BC, communities are feeling the ever-increasing impact of climate change. It's changing the environment, affecting water availability, and calling for proactive measures to manage water resources. The District's approach to water management has evolved since the 2015 WCP. The District has embraced new technologies, updated their planning and investment strategies, and revised regulations to better meet these challenges head-on.

4.2.2 MITIGATIVE ACTIONS

The climate is showing a trend of increasing variability and more frequent extreme weather events, which have substantial effects on infrastructure, society, and the economy. The District of Squamish has been proactive, investing in resilient infrastructure for increased water demand supply and monitoring, regulatory updates, water conservation programs, and enhancing community education on water sustainability. These initiatives were just the beginning of a more robust response to the climate risks they face.

4.2.3 STRATEGIC ADAPTATIONS

As temperatures rise, so does water usage, especially during summer months as demonstrated by the data summarized in this WCP. It's become clear that the District should work on strengthening water conservation efforts to manage this increased demand and reduce the risk of drought impacts. The myth of an endless water supply is progressively fading, and the District aims to foster a strong conservation ethic in the community to further support the goals of the District to reduce water demands.

Looking ahead, the 2024 WCP builds on these insights, adopting a comprehensive strategy to mitigate climate change impacts. By increasing the efficiency of the water distribution systems, encouraging public involvement in conservation practices, and adapting the existing infrastructure, the District can prepare for a sustainable future that allows for careful and detailed planning as the District's needs evolve.

5 REVISED WATER CONSERVATION TARGET

5.1 REVIEW OF PREVIOUS WATER CONSERVATION TARGETS

In the previous 2015 WMP, the District aimed for a 15% reduction in per capita ADD by 2031. Currently, it was found that there has been a 16% decrease in per capita ADD usage since 2015, despite rapid population growth, implementation of irrigation systems, and climate change. The reduction in per capita usage is likely due to the addition of more multi-family residential buildings instead of single-family housing which requires more outdoor water usage.

5.2 RENEWED FOCUS ON WATER CONSERVATION

Despite the decrease in per capita ADD usage, the District should continue to support water conservation objectives. Key initiatives include enhancing community engagement, particularly involving summer students, to promote long-term water conservation awareness, continuing collaborations with institutions and facilities, making amendments to existing water use bylaws, and implementing a water rate structure that promotes water conservation.

Similarly, opportunities for water reclamation systems in the WWTP and other key water users throughout the District should be evaluated to further reduce water consumption through water reuse. Additionally, revisions in water restriction stages, combined with xeriscaping, aim to reduce watering requirements on properties. The progression toward expanding metering coverage for new developments and redevelopment properties remains a priority to improve system oversight and identify areas for demand reduction. These initiatives will be explained in more detail in future sections.

5.2.1 WATER CONSERVATION GOALS

The District's short-term goals focus on raising community awareness about the importance of water conservation and adapting operational strategies such as water audits and bylaw revisions. These efforts are expected to contribute to a long-term vision of reducing overall water consumption, delaying infrastructure expenditures, and enhancing the knowledge and management of the water distribution network.

5.2.2 REVISED WATER CONSERVATION TARGET

Despite recent decreases in per capita water demand, the District remains committed to reducing current water demands by 20% by the new target year, 2041. Ongoing and expanded metering initiatives across the District, particularly for key ICI and residential properties, are crucial in measuring and tracking progress toward this goal.

Enhanced system oversight, informed by comprehensive data collection from the expanding metering infrastructure, will guide the District in identifying and addressing water loss throughout the system. This approach, coupled with effective water-saving initiatives, is expected to drive significant improvements in water management and therefore, water consumption.

Based on this new target, the projected decrease in per capita water demands and overall ADD and MDD are shown in Figure 5-1 and Figure 5-2 below:

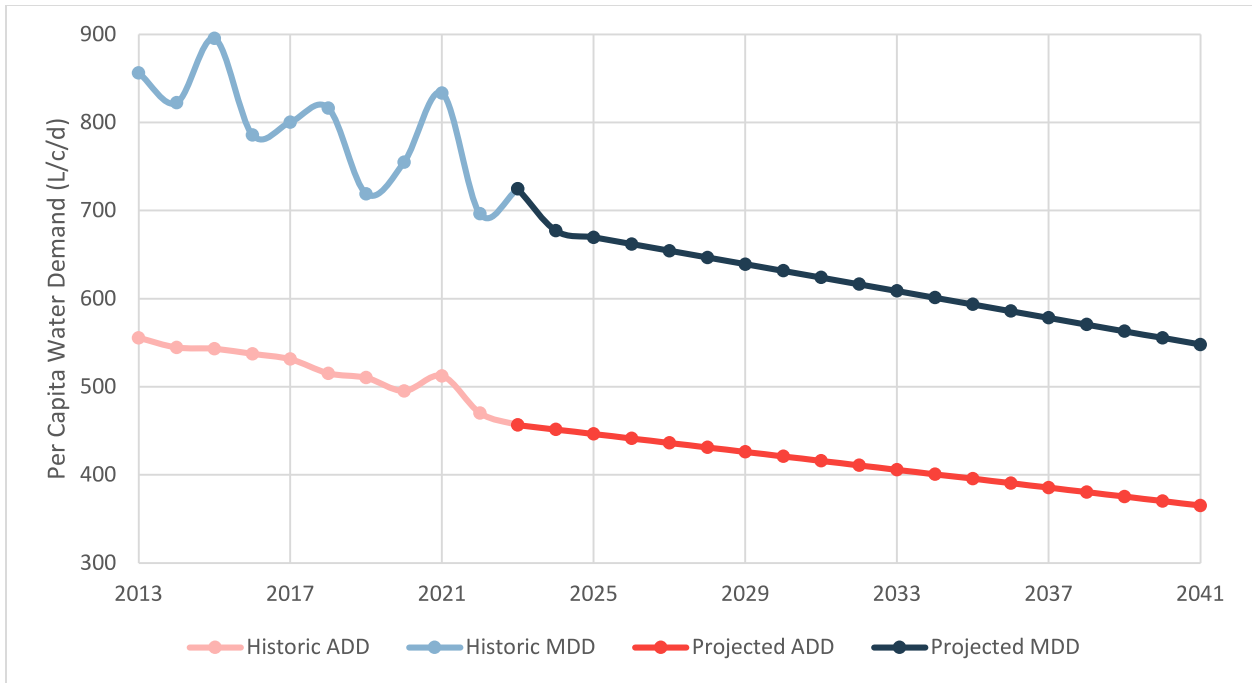


Figure 5-1: Projected District Per Capita ADD and MDD with 20% Water Consumption Reduction

Figure 5-1 above assumes that despite a 4% annual increase in population, the per capita water demands will be reduced linearly until the ADD and MDD targets of 365 lpcd and 548 lpcd are achieved, respectively. This translates into a 1.1% reduction in per capita consumption per year.

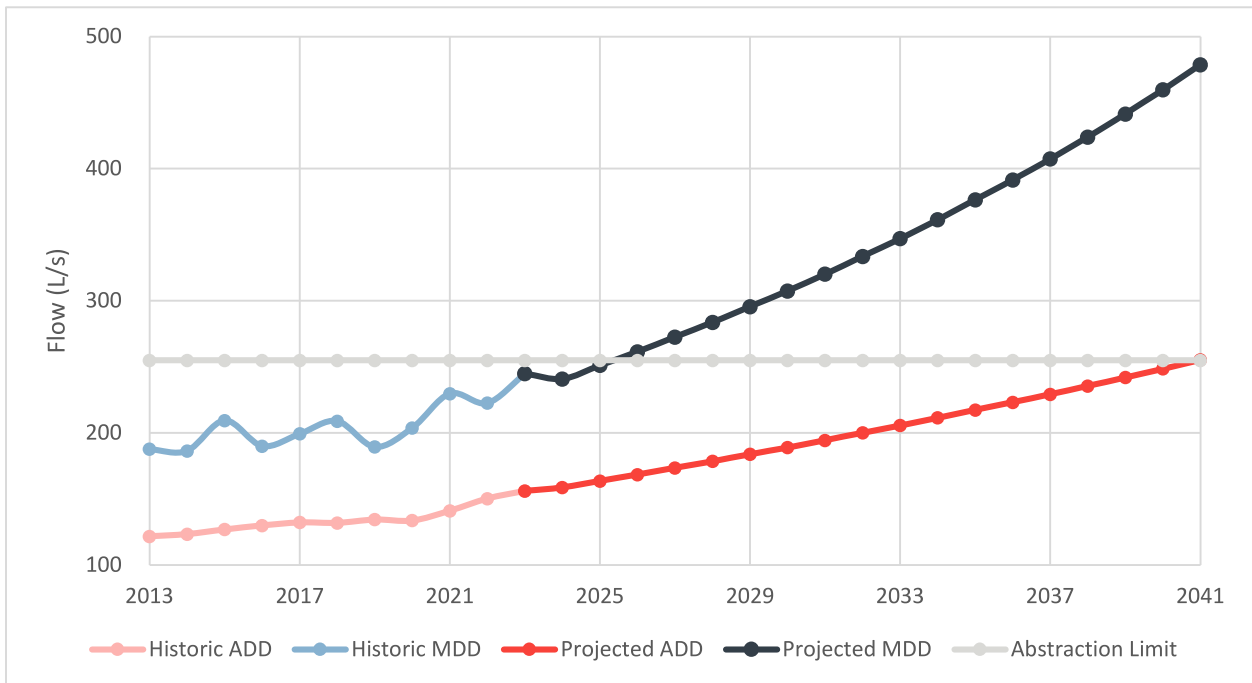


Figure 5-2: Projected ADD and MDD in MLD with 20% Water Consumption Reduction

In Figure 5-2, the 20% reduction in ADD and MDD is shown to keep water use within Powerhouse Springs' abstraction limit of 255 L/s until 2025. Therefore, it is anticipated that by 2026, a new well and pump will be

necessary at Powerhouse Springs to meet the rising MDD. An increase in the abstraction limit at Powerhouse Springs would also be necessary.

5.2.3 MONITORING AND ADJUSTING TARGETS:

As a living document, the updated WCP should be used to assess the impact of ongoing initiatives and changing community needs and should be revised periodically to align with significant changes in the District that may alter operations.

Performance indicators derived from the metering system and other data sources will be crucial in evaluating progress and guiding future actions. With the support of an ever-increasing set of data provided by the expansion of meters throughout the District, and improved water management, Table 5-1 summarizes some of the Key Performance Indicators (KPIs) that may be tracked to help the District make educated decisions to ensure the long-term health and reliability of the system.

Table 5-1: Key Performance Indicators:

KEY PERFORMANCE INDICATOR	DESCRIPTION
Average Daily Demand (ADD)	Measures the average amount of water used per day over a specific period
Maximum Day Demand (MDD)	The highest volume of water used in a single day within a year
Leakage Rate	Assesses the volume of water lost due to leaks, often expressed as a percentage of the total water produced
Infrastructure Leakage Index (ILI)	A more specific measure of leaks within the water distribution network
Pressure Management Efficiency:	Monitoring and managing the pressure within the distribution system to reduce leakages and potential bursts, and to extend the life of the infrastructure
Customer Consumption Patterns	Analysis of consumption data to identify trends, peak usage times, and potential areas for conservation efforts
Metering Penetration Rate	The percentage of the customer base with metered connections. Higher rates allow for more accurate billing and water use monitoring
Compliance with Water Quality Standards	Regular testing to ensure water meets health and safety standards, with a focus on maintaining or improving compliance rates
Public Engagement Metrics	Measuring the effectiveness of public outreach programs in water conservation through participation rates, survey feedback, and changes in public consumption behaviors
Economic Level of Leakage (ELI)	This indicator assesses the cost-effectiveness of managing leaks within the water distribution system. The ELI is the point at which the cost of reducing leakage equals the cost incurred by the leakage itself.

6 REVIEW OF POTENTIAL WATER CONSERVATION PROGRAMS

6.1 INTRODUCTION TO RECOMMENDED POTENTIAL WATER CONSERVATION PROGRAMS

As the District of Squamish strives towards achieving its water conservation goal of reducing water demands by 20% by 2041, it becomes increasingly important to explore and implement a range of strategic programs. The recommendations in this section are proposed not only with the objective of reducing overall water demands but also with a vision to foster a sustainable water management culture within the community. Each program recommendation, whether it involves legal, economic, infrastructural, educational, or collaborative measures, is designed to address specific aspects of water usage and conservation. These initiatives aim to ensure the long-term sustainability of the available water resources and alignment with the broader environmental goals of the District. The initiatives presented in this section are as follows:

- Legal Tools and Bylaw Updates
- Economic Tools: Conservation-Focused Water Rate Structure
- Network and Customer Demand Tools: Metering and Leak Detection
- Education and Outreach Programs Expansion
- Partnership and Collaboration Initiatives: Focusing on High-Usage Sectors

These strategies represent a comprehensive approach to tackling the multiple challenges associated with water conservation, ranging from legal tools that ensure compliance and efficiency to educational efforts that build community awareness and participation. The goals are to reduce water consumption, enhance system efficiency, promote responsible usage, and ensure equitable access to water resources. By implementing these programs, the District commits to an adaptive, responsive, and forward-thinking management of its water resources, setting an example for responsible and sustainable water management.

6.1.1 LEGAL TOOLS AND BYLAW UPDATES

Purpose and Expected Outcomes: Legal frameworks and bylaws are crucial in shaping user behaviour and ensuring compliance with water conservation standards. By updating these legal tools, the District aims to address the evolving needs of the community, particularly focusing on outdoor water use and metering policies. These revisions are expected to improve water conservation efforts, reduce peak demand, and facilitate efficient water usage across various sectors. Through these changes, the District anticipates a more sustainable use of water resources, supported by community engagement and compliance. Details on the recommendations are as follows:

- **Expansion of Bylaws:** Introduce considerations for Xeriscaping in the bylaws to reduce property watering requirements. This will encourage the adoption of drought-resistant landscaping, decreasing water usage for irrigation. Furthermore, staged restrictions will be reviewed periodically to ensure that they maintain the effect intended in limiting water demand during peak periods.
- **Enforcement through Community Engagement:** Address staffing challenges by hiring summer students to enforce bylaws, increasing community engagement, and ensuring compliance. This approach also provides educational opportunities for the students.
- **Metering and Rate Structure in Bylaws:** Expand metering coverage to allow for a detailed review of usage patterns, especially in new developments where meter chambers are already mandatory. Consider requiring meter installations during redevelopment, with potential incentives for high water users. This approach allows for a more accurate water rate structure that encourages conservation.

- **Voluntary Program for Meter Installation:** Encourage single-family homeowners to install water meters by offering incentives like reduced rates and rebates. Align this program with the future inclining block rate structure for seamless integration into the billing system. Bylaws will need amendments to recognize these early adopters. This program would extend to properties where the meter chamber has been implemented but meters have not been installed. Further details on potential considerations for the rate structure and incentives will follow.
 - **Grandfathered Rates:** Early adopters could be assured the best rates upon implementation of the inclining block rate structure, potentially expediting the move towards universal metering.
 - **Extended Payment Plan:** An interest-free payment plan could alleviate the financial burden of meter installation, allowing costs to be distributed over several billing cycles.
 - **Water Usage Reports:** Provide comprehensive reports to assist homeowners in managing their water use. Highlight the added benefits of Xeriscaping, consider applying further benefits for its implementation, and promote these through insightful water consumption analyses included in these reports if they are determined to be financially feasible.
-

6.1.2 ECONOMIC TOOLS: CONSERVATION-FOCUSED WATER RATE STRUCTURE

Purpose and Expected Outcomes: The implementation of a conservation-focused water rate structure is a key economic tool to incentivize responsible water usage. The implementation of a single- or multi-step rate structure can foster water conservation while maintaining fairness and affordability. This approach incentivizes users to cut back on non-essential water use, and the additional revenue generated can be allocated to further conservation initiatives and infrastructure improvements. The success of this initiative will be measured in the reduction of overall water demand and the efficiency of water use across the District. To encourage sustainable and environmentally friendly water consumption patterns, the following could be considered:

- **Single-Step Rate Structure:** Implement a single-step rate structure where water is charged per cubic meter of usage. This incentivizes conservation by making essential water use affordable while charging more for non-essential, higher usage. This single-step rate structure is to promote the initiative that unmetered ICI and MF residential properties are adequately billed until metering is added at the time of redevelopment at the cost of the owner and/or developer. The District may also opt for a multi-step rate structure where rates increase with higher consumption levels.
- **Revenue Utilization:** Use additional revenue from higher rates to support water main replacements, educational programs, and meter installations in high-consumption properties, further reinforcing water conservation efforts across the District.

Further details on this initiative are included in the District’s Water and Sewer Rates Study Report.

6.1.3 NETWORK AND CUSTOMER DEMAND TOOLS: METERING AND LEAK DETECTION

Purpose and Expected Outcomes: Effective management and monitoring of water distribution are essential for identifying inefficiencies and reducing water loss. By expanding metering and implementing a structured leak detection program, the District intends to significantly improve the management of water resources. These initiatives will not only help in reducing unaccounted-for water but also in optimizing the distribution network. The expected result is a more efficient water system with reduced losses, contributing directly to the overall goal of lowering water demands. To reduce and obtain a better understanding of the current leakage the system experiences, we recommend the following:

- **Develop a Leak Monitoring Plan:** Although staffing challenges have delayed a formal leak monitoring plan, the District may experiment with new in-situ leak detection methods as well as use data collected from zone meters to pinpoint significant leak areas and carry out repairs. This combined with water audits, particularly at service connections, will help minimize water losses and improve system efficiency.

- **Promote a Collaborative Approach:** Foster a culture of collaboration with the community to facilitate access for repairs, aiming for mutual trust and understanding of the benefits of minimizing water losses.
-

6.1.4 EDUCATIONAL AND OUTREACH PROGRAMS EXPANSION

Purpose and Expected Outcomes: Education and outreach are vital for cultivating a culture of water conservation within the community. By expanding these programs, the District aims to increase awareness and engagement among residents and businesses about the importance of water conservation. Diverse communication strategies will be employed to reach a broader audience. The success of these programs will be reflected in a more informed community, exhibiting responsible water usage behaviors, and actively participating in conservation efforts. To promote a collaborative effort and the establishment of a culture of water conservation, we recommend the following:

- **Diversifying Communication Channels:** Beyond website updates, consider using social media, local newsletters, community events, and schools to disseminate information on water conservation initiatives, aiming for broader community engagement.
 - **Measuring Success:** Success will be gauged through community feedback, increased reporting of leaks by residents, and a general shift towards a culture of water preservation.
 - **Continue to Improve Community Relationships:** A collaborative approach with the community can help bridge the gap with data collection limitations that may be encountered during the process.
-

6.1.5 PARTNERSHIP AND COLLABORATION INITIATIVES: FOCUSING ON HIGH-USAGE SECTORS

Purpose and Expected Outcomes: Targeting high-usage sectors through strategic partnerships and collaboration initiatives is essential for impactful water conservation. By focusing on sectors like breweries and large residential properties, the District plans to implement tailored conservation strategies, including metering and water reclamation projects. We understand that at the time of this WCP, all breweries are metered, and further improvements would involve water audits to promote responsible and efficient water usage. These initiatives are expected to yield significant reductions in water usage within these sectors, setting a precedent for other areas and contributing to the District's overall conservation goals. To mitigate water demands from high-consumption sectors, we recommend the following:

- **Targeted Metering and Audits:** Prioritize accurate metering and specialized audits for high-usage sectors to understand and improve their water consumption patterns.
- **Water Reclamation Systems:** Gradually implement water reclamation systems in industrial and commercial sectors. Explore the potential of reusing water in facilities like WWTPs and consider future upgrades for water-efficient technologies.
- **Residential Water Audits:** Conduct water audits for residential consumers to identify leaks and encourage behavior changes that contribute to water conservation. These audits are particularly vital for unmetered properties, helping identify areas needing immediate attention or future metering.

7 PROPOSED WATER CONSERVATION PLAN

7.1 SELECTION OF NEW WATER CONSERVATION PROGRAMS

The Squamish 2024 Water Conservation Plan (WCP) Update employs a strategic prioritization approach, ensuring that each initiative aligns with the overarching goals of sustainable water management and efficient resource utilization. The rationale for this prioritization is based on a phased and systematic approach, focusing on:

- 1 Data-Driven Infrastructure Implementation:
 - a Establishing a foundation for informed decision-making.
 - b Continuing to implement key infrastructure for effective monitoring and data collection.
- 2 Regulatory Changes for Customer Behavior Influence:
 - a Updating bylaws and regulations to guide sustainable water usage.
 - b Emphasizing long-term sustainability of the water distribution system.
- 3 Public Engagement and Education:
 - a Fostering a culture of water conservation within the community.
 - b Transforming residents into active participants in conservation efforts.
 - c Creating an understanding of the effects of climate change on the long-term operation of the distribution system.
- 4 Targeted Strategies for High-Usage Sectors:
 - a Focusing on sectors with significant water usage to optimize their consumption.
 - b Synchronizing initiatives with other conservation efforts for enhanced management.

Table 7-1 below presents a comprehensive overview of the selected Water Conservation programs. It outlines specific implementation strategies and expected outcomes, demonstrating how each initiative is connected and how they contribute to the District's overarching objective of sustainable water management.

Table 7-1: Water Conservation Plan Programs

WATER CONSERVATION PROGRAM	PROGRAM RECOMMENDATION STATEMENT
1. Revisiting Development Bylaws for Metering Expansion	This program aims to amend development bylaws to mandate the installation of water meters for new developments and the redevelopment of existing single- and multi-family properties, expanding on the current requirement for new developments to include meter chambers. Unmetered homeowners will be offered incentives through a voluntary early adoption program. By encouraging meter installations during redevelopment phases, the District aims to improve water use monitoring and conservation, ultimately contributing to more efficient and responsible water resource management across the community.
2. Leak Detection and Infrastructure Modernization	Zone meter data will be the primary source of information for a targeted approach to leak detection activities. Developing a targeted leak detection strategy will provide an improved understanding of the system and help to target critical areas of the water distribution system. Note that the AC Renewal Plan Update (2024) advises replacing over 45 km of watermains to enhance the efficiency of the distribution system.

<p>3. Bylaw Revision and Enforcement</p>	<p>Updating outdoor water use bylaws is an important consideration for adapting to current environmental conditions and community growth. This program aims to strengthen bylaw enforcement, potentially supported through increased staffing with summer students, to ensure compliance and promote water-saving practices among residents and businesses. It is key to maintaining a balance between water supply and demand.</p>
<p>4. Conservation-Focused Water Rate Structure</p>	<p>Implementing a single-tier water rate structure will promote water conservation and ensure fair water usage. This economic tool encourages users to manage their consumption effectively, with a higher rate for increased non-essential use. The District may want to initially implement a single-tier water rate structure, with plans to transition to a multi-tier rate structure in the future. Revenue generated from this program will support further conservation initiatives, making it a sustainable approach to water management.</p>
<p>5. Public Education and Engagement</p>	<p>Expanding education and outreach efforts is key to building community awareness and participation in water conservation. This program would utilize various communication channels to disseminate information and engage residents in sustainable water usage practices. Its success is important for fostering a long-term conservation culture within the community.</p>
<p>6. Sustainable Practices and Incentives</p>	<p>Integrating sustainable practices such as xeriscaping into municipal planning and bylaws is crucial for reducing irrigation demands. This program encourages the adoption of water-efficient landscaping in both residential and commercial properties, contributing significantly to the reduction of overall water usage.</p>
<p>7. Strategic Partnerships and Programs</p>	<p>Focusing on high-usage sectors, such as breweries, pools, the local hospital, and other institutions; this program aims to develop strategic partnerships and implement targeted initiatives like meter additions, free water audits, and water reclamation projects. These efforts are expected to yield substantial water savings in sectors that have a significant impact on the community’s water demand.</p>

7.2 PROPOSED IMPLEMENTATION SCHEDULE & BUDGET

This section outlines the proposed schedule and budget allocations for the implementation of the selected water conservation programs. These projections are intended to provide a framework for planning and resource allocation, enabling effective and timely execution of each initiative.

Refer to Table 7-2 below for a summary of the allocated budgets and a brief description of the preliminary scope for the implementation of the proposed initiatives.

Table 7-2: Water Conservation Plan Schedule and Budget

WATER CONSERVATION PROGRAM	ESTIMATED BUDGET (2024-2041)	DETAILS
Revisiting Development Bylaws for Metering Expansion	Bylaw Revision: \$20,000 Operations: \$25,000/year	A new program aimed to mandate meter installation for new developments and the redevelopment of existing single- and multi-family properties, expanding on the current requirement for new developments to include meter chambers. Includes costs for amending development bylaws, data integration systems, and staff training.
Leak Detection and Infrastructure Modernization	\$43.6 M from 2024-2040 + staff training and additional leak detection equipment	Replacement of 26 km of existing water mains and investment in modern leak detection technologies and staff training for proactive leak detection and repair programs.
Outdoor Water Use Bylaw Revision and Enforcement	Bylaw Revision: \$20,000 Enforcement: \$25,000/year	Costs associated with legal consultation for outdoor water use bylaw revisions, public notification processes, and additional staffing to promote water-saving practices for enforcement.
Conservation-Focused Water Rate Structure	Currently in Development	Development and implementation of a new single- or multi-step rate structure, primarily requiring administrative efforts.
Public Education and Engagement	\$25,000/year	Regular budget for communication materials, community events, digital outreach, and partnership programs.
Sustainable Practices and Incentives	\$50,000/year	Development of guidelines and incentives for xeriscaping, including public workshops and promotional materials.
Strategic Partnerships and Programs	\$100,000/year	Establishing partnerships, targeted metering programs, and support for water reclamation projects in high-usage sectors.

7.3 MONITORING AND EVALUATING DEMAND TRENDS

This section describes the approach and methods the District of Squamish will use to monitor and analyze trends in water demand. Effective monitoring is essential to evaluate the success of the water conservation programs and to guide adjustments in strategies as needed.

Data Collection and Analysis

- Utilization of the expanded metering infrastructure and advanced data analysis tools to collect comprehensive water usage data across various sectors, including residential, industrial, commercial, and institutional.
- **Frequency:** Continuous monitoring with data analysis conducted on a quarterly basis to identify trends and anomalies.

Key Performance Indicators (KPIs)

- Identification of relevant KPIs such as Average Daily Demand (ADD), Maximum Day Demand (MDD), Non-Revenue Water, and Leakage Rates specific to the area or sector being evaluated. Some KPIs were introduced in Section 5.2.3.

- **Tracking and Reporting:** Regular tracking and reporting of these KPIs to assess the progress towards conservation targets and to identify areas needing further attention.

Program Effectiveness Evaluation

- Regular comparison of current water demand trends with historical data to evaluate the impact of the conservation programs.
- **Adjustments Based on Findings:** Using the insights gained from data analysis to make necessary adjustments to conservation strategies and initiatives.

Public Reporting and Community Engagement

- Regular public reporting on water demand trends and conservation program effectiveness to maintain transparency and community engagement.
- **Utilization of Digital Platforms:** Leveraging the District's website, social media, and other digital platforms to share water demand trend information and program updates.

Collaboration for Enhanced Understanding

- Collaborating with water management experts and researchers for advanced analysis and understanding of demand trends.
- **Engaging with Stakeholders:** Regular engagement with key stakeholders, including businesses, community groups, and residents, to gather feedback and insights on water usage patterns and conservation program effectiveness.

Adaptation to Changing Conditions

- Being responsive to emerging trends and changing conditions, such as population growth, climate change, and technological advancements, to ensure that water management strategies remain effective and relevant.

7.4 ADDITIONAL RECOMMENDATIONS AND FUTURE DIRECTIONS

7.4.1 POTENTIAL FUTURE INITIATIVES AND CONSIDERATIONS

While the primary focus of the Squamish 2024 Water Conservation Plan Update is on the main conservation programs, the following additional recommendations present potential future strategies. These initiatives could be highly beneficial once the core programs are well-established, and the District seeks to further enhance its water conservation efforts:

In-Depth Water Audits for Residences and Businesses

- **Objective:** To provide detailed assessments of water usage and efficiency opportunities in homes and businesses.
- **Details:** Focus on comprehensive audits post-establishment of core metering programs, offering tailored advice on water-efficient technologies and potential payback periods.

Sophisticated Rainwater Harvesting

- **Objective:** To explore advanced methods for utilizing rainwater, particularly for non-potable applications.
- **Details:** Consider implementing sophisticated rainwater harvesting systems as an additional strategy for water savings once initial conservation measures are in place.

Regular Water Meter Maintenance

- **Objective:** To maintain the accuracy and reliability of the expanded metering infrastructure.

- **Details:** Develop a regular maintenance and calibration program for water meters to ensure ongoing precise water usage data and efficient billing.

Insulation of Water Heaters and Piping

- **Objective:** To enhance energy and water efficiency through improved insulation.
- **Details:** Encourage and potentially support the insulation of water heaters and piping to reduce leaks and energy losses, complementing water conservation measures.

Recognition Programs for Water-Conserving Businesses

- **Objective:** To motivate and acknowledge businesses actively engaged in water conservation.
- **Details:** Develop programs to recognize and support businesses that significantly contribute to reducing their environmental impact through sustainable water practices.

Responsible Wastewater Management

- **Objective:** To promote efficient wastewater practices for further conservation benefits.
- **Details:** Encourage wastewater reuse and pretreatment initiatives, aiming to reduce the load on the wastewater treatment plant and enhance water conservation.

Expanding Initiatives to High Water-Use Businesses

- **Objective:** To extend water conservation efforts to sectors with traditionally high-water usage.
- **Details:** Focus on targeted conservation strategies for businesses like car washes, restaurants, hotels, and gymnasiums, aiming to optimize their water consumption.

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APPENDIX

C AC WATERMAIN RENEWAL PLAN UPDATE

DISTRICT OF SQUAMISH
REPORT NUMBER: 221-11672-00

AC WATERMAIN RENEWAL PLAN UPDATE

DECEMBER 06, 2024

FINAL





AC WATERMAIN RENEWAL PLAN UPDATE

DISTRICT OF SQUAMISH

FINAL

PROJECT NO.: 221-11672-00
DATE: DECEMBER 06, 2024

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December 06, 2024

FINAL

District of Squamish
37955 Second Avenue
Squamish, BC
V8B 0A3

Attention: David Roulston, P.Eng., Senior Manager of Infrastructure Planning

Dear Sir:

Subject: 2024 AC Watermain Renewal Plan Update

WSP Canada Inc. is pleased to present the 2024 AC Watermain Renewal Plan. Our focus is to support the District's goal of replacing all asbestos cement watermains by 2040. Key aspects of our AC watermain assessment include:

- Categorizing each watermain based on the associated risks;
- Assigning the consequence of failure to all AC Watermains;
- A replacement plan draft to inform a capital plan for replacing; and
- Cost analysis for replacement of AC Watermains.

We are committed to working collaboratively with the District, aiming to create a plan that is not only responsive to current challenges but also adaptable for future needs.

We look forward to discussing this update with you and are open to any suggestions or clarifications you may have.

Yours truly,

A handwritten signature in black ink, appearing to read 'Michael Levin', is enclosed in a light gray rectangular box.

Michael Levin, P. Eng., PMP
Project Manager

TN/BM/ML/CL/AK/ab
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SIGNATURES

PREPARED BY



December 6, 2024

Christopher Lau, EIT
Project Engineer

APPROVED BY



The image shows a handwritten signature of Michael Levin next to a circular professional seal. The seal contains the text: 'PROFESSIONAL ENGINEER OF BRITISH COLUMBIA M. LEVIN # 48883'. Below the seal is the date '2024-12-06'.

December 6, 2024

Michael Levin, P.Eng., PMP
Project Manager

PERMIT NUMBER: 1000200

WSP CANADA INC. 2024-12-06

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TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	Purpose	1
1.2	Background.....	1
1.3	Scope	1
2	AC RENEWAL PROGRAM UPDATE.....	2
2.1	Approach to Update	2
2.1.1	Information Gathering	2
2.2	Probability of Failure.....	2
2.2.1	Age Rating	3
2.2.2	Pressure Rating.....	5
2.2.3	Soil Rating	7
2.2.4	Combined Probability of Failure	9
2.2.5	Break History Analysis	11
2.3	Consequence of Failure.....	12
3	UPDATED RISK ANALYSIS	14
4	UPDATED RENEWAL PLAN	16
5	CLOSURE	20
6	BIBLIOGRAPHY.....	21

TABLES

TABLE 2-1:	AGE RATING RUBRIC AND STATISTICAL ANALYSIS FOR AC WATERMAINS, NORMALIZED FOR 2022 DATASET	3
TABLE 2-2:	PRESSURE RATING RUBRIC AND STATISTICAL ANALYSIS FOR AC WATERMAINS	5
TABLE 2-3:	SOIL RATING RUBRIC AND STATISTICAL ANALYSIS FOR AC WATERMAINS	7
TABLE 2-4:	PROBABILITY OF FAILURE RUBRIC AND STATISTICAL ANALYSIS OF AC WATERMAINS	9



TABLE 2-5:	RATING CONSEQUENCE OF FAILURE RUBRIC	13
TABLE 3-1:	RISK DISTRIBUTION RUBRIC FOR AC WATER MAINS, % OF TOTAL AC WATERMAIN LENGTH	14
TABLE 4-1:	RISK SCORE & RECOMMENDED ACTION ..	16
TABLE 4-2:	WATERMAIN UNIT RATE COSTS FOR CAPITAL IMPROVEMENT PROJECTS.....	16
TABLE 4-3:	REVISED WATERMAIN SERVICE LIFE	17
TABLE 4-4:	APPROXIMATE ANNUAL REINVESTMENTS REQUIRED (IN 2024 CONSTANT DOLLARS)	18

FIGURES

FIGURE 2-1:	AC WATERMAIN AGE DISTRIBUTION (2022 DATASET)	3
FIGURE 2-2:	AGE RATING OF ASBESTOS CEMENT WATERMAINS IN THE DISTRICT OF SQUAMISH.....	4
FIGURE 2-3:	PRESSING RATING APPLIED TO ASBESTOS CEMENT WATERMAINS IN THE DISTRICT OF SQUAMISH.....	6
FIGURE 2-4:	SOIL RATINGS APPLIED TO ASBESTOS CEMENT WATERMAINS IN THE DISTRICT OF SQUAMISH.....	8
FIGURE 2-5:	PROBABILITY OF FAILURE APPLIED TO ASBESTOS CEMENT WATERMAINS IN THE DISTRICT OF SQUAMISH	10
FIGURE 2-6:	STATISTICAL ANALYSIS OF AC WATERMAIN BREAKS WITHIN THE DISTRICT OF SQUAMISH FROM 2015-2022, CATEGORIZED BY PROBABILITY OF FAILURE	11
FIGURE 2-7:	STATISTICAL ANALYSIS OF AC WATERMAIN BREAKS WITHIN THE DISTRICT OF SQUAMISH FROM 2015-2022, CATEGORIZED BY WATERMAIN AGE	12
FIGURE 3-1:	TOTAL RISK SCORE APPLIED TO ASBESTOS CEMENT WATERMAINS IN THE DISTRICT OF SQUAMISH	15
FIGURE 4-1:	PRELIMINARY AC WATERMAIN RENEWAL PLAN.....	17
FIGURE 4-2:	SUGGESTED PIPE REPLACEMENT PRIORITY	19

1 INTRODUCTION

1.1 PURPOSE

As part of the 2024 Water Master Plan Update process, the District of Squamish (District) has retained WSP Canada Inc. (WSP) to update the District's asbestos cement (AC) watermain replacement strategy. WSP previously completed the 2015 AC Watermain Renewal Plan. The District's AC watermain replacement strategy identifies priority watermain assets which must be replaced expediently, as well as opportunities for deferrals. WSP identifies these opportunities by conducting a thorough risk assessment of the District's AC watermain inventory. This includes updating the probability of failure analysis with recent replacements and current system pressures. This report presents the updated AC Watermain Renewal Plan for the 2024-2040 planning horizon.

The outcomes of this report include a financial analysis to quantify the cost implications of AC watermain replacements on the water utility. The associated investment in the network supports maintaining current levels of service as AC watermains deteriorate over time. This report updates the spending backlog forecasted and presents a defensible methodology for watermain replacement deferrals where possible, based on the current state of infrastructure and local tolerances for the consequence of failure.

1.2 BACKGROUND

As watermains age, municipalities are faced with the challenge of assigning limited capital expenditures to their water network's replacement or rehabilitation. AC watermains have the shortest expected service life of most pipe materials in utility inventories and continue to form a considerable portion of the District's water network. Softening of the pipe walls is known to occur in AC watermains, a deterioration process unlike most other pipe materials. The deterioration of AC watermains significantly impacts renewal planning and budgeting, depreciation analysis, and acceptable levels of risk. Thus, the expected service life and condition of AC watermains are very important for water utilities to monitor.

Since the 2011 Asset Management Plan, the District has been actively involved in replacing the highest-risk segments of AC watermains. In 2011, AC pipes totaled approximately 46% (56.7 km, by total watermain length) of the District's water network. This was reduced to approximately 45% by 2016 and significantly reduced to 32% in 2022.

Effective management of a watermain inventory requires a measured renewal plan based on a sensible assessment of current conditions, along with a reliable methodology to forecast future renewal requirements under different financial planning scenarios. WSP has continued with the risk assessment approaches successfully employed in 2015 and has updated the results to identify the current day's high-priority AC watermain replacements. In this way, the District has the possibility of deferring AC watermain replacements until they pose an unacceptable risk of failure. The outcome of this report has been incorporated into the financial modelling of the 2024 Water Master Plan update and can be used by the District at the next update of its AMP.

1.3 SCOPE

This report updates the existing 2015 AC Watermain Renewal Plan results to incorporate relevant updated data. The AC watermain inventory was updated to reflect ongoing watermain replacements carried out by the District since 2015. The probability of failure analysis has been updated to reflect current system pressures and asset ages. This 2024 AC Watermain Renewal Plan Update Report discusses each of the activities undertaken by WSP as part of its assessment and provides updated financial forecasts and cost implications.

2 AC RENEWAL PROGRAM UPDATE

2.1 APPROACH TO UPDATE

The previous AC watermain plan assessed the risk of watermains to prioritize the AC renewal program. In this framework, risk was assigned to each watermain by considering the probability that the watermain would fail together with the consequences if it were to fail.

The probability of failure is understood through three major factors: the age of the pipe, average operating pressure, and the soil that the main is buried in. The following Section 2.2 describes how the three aspects of failure are assigned a rating ranging from 1 to 5, and details what has been updated in relation to the previous 2015 AC Renewal Report.

The consequence of failure is a metric that factors how much disruption a watermain break would cause to the water network and adjacent infrastructure. If a watermain break occurs on a major roadway or bridge, the consequence will be much greater than if a watermain were to break in a neighbourhood cul-de-sac. In this report, the consequences of failure for each watermain asset are assumed to have stayed the same, therefore, the consequence has been taken from the previous 2015 AC Renewal Plan and applied in this update without alteration.

Combining both the risk of failure and the consequence of failure, an overall risk is created and assigned to each AC watermain. This creates a consistent and rational method to prioritize AC watermain replacement.

2.1.1 INFORMATION GATHERING

The information used in this update included information gathered as part of the 2024 Water Master Plan update process:

- Updated District’s Hydraulic Water Model
- District’s most updated watermain inventory shapefile
- District break records (from 2015 to 2022)
- 2015 AC Watermain Renewal Plan watermain consequence of failure rating
- 2015 AC Watermain Renewal Plan National Earthquake Hazards Reduction Program (NEHRP) soils map

Using the above-noted data, WSP was able to provide this update on the AC replacement strategy. The District’s files are well organized, and effort should be continued to maintain this current data set for future analysis and use.

2.2 PROBABILITY OF FAILURE

In the context of AC watermains, the probability of failure quantifies how likely a watermain break occurrence is. As an AC watermain ages, its walls become thinner and more brittle and therefore are more likely to rupture. In addition to age, WSP considered the typical operating pressure of the watermain, as well as the soil in which it is located. With each category, a rating is assigned to each watermain from one to five. Averaging the ratings produces the probability of failure. This matches the approach used to quantify the probability of failure in the original 2015 AC Watermain Renewal Plan produced by Opus (now WSP). After each watermain was assigned a probability of failure, available break history records were used to correlate the accuracy of this rating.

For the AC Watermain Renewal Plan Update, the expected service life of AC material pipes has been revised from 50 years to 60 years. This adjustment is based on a 2013 study by the American Water Works Association (AWWA) entitled “Buried No Longer: Confronting America’s Water Infrastructure Challenge”, which identified that AC pipes installed in the West Coast region could potentially last for approximately 65 years or even longer, subject to specific ground conditions and utility practices. As this study incorporated the most current operational experiences and findings from extensive research, as well as professional expertise regarding the common conditions of pipes of

various ages and sizes, WSP determined that extending the service life to 60 years would most accurately reflect the analysis while maintaining a conservative approach.

2.2.1 AGE RATING

Figure 2-1 presents the age distribution of AC watermains observed by WSP during its desktop review.

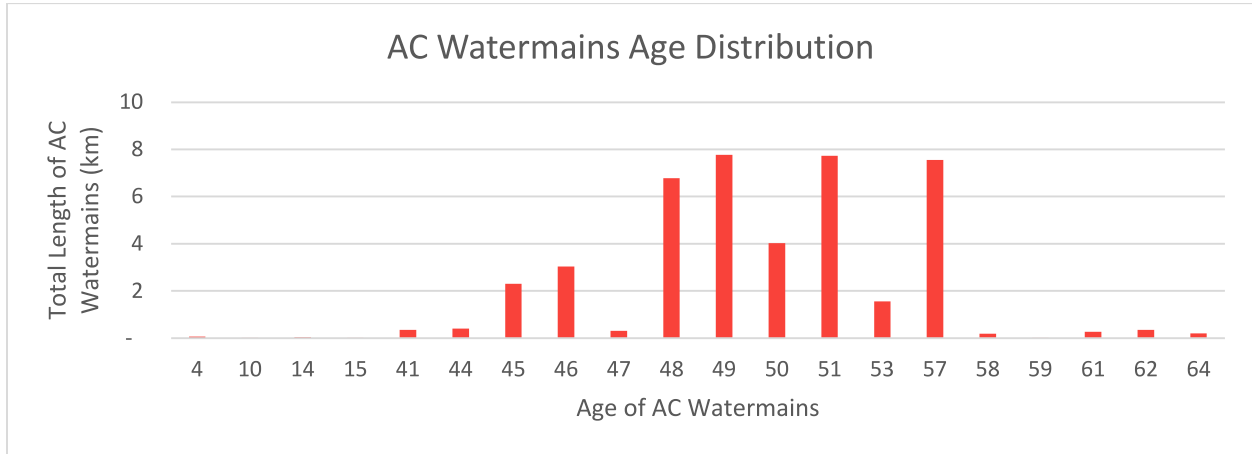


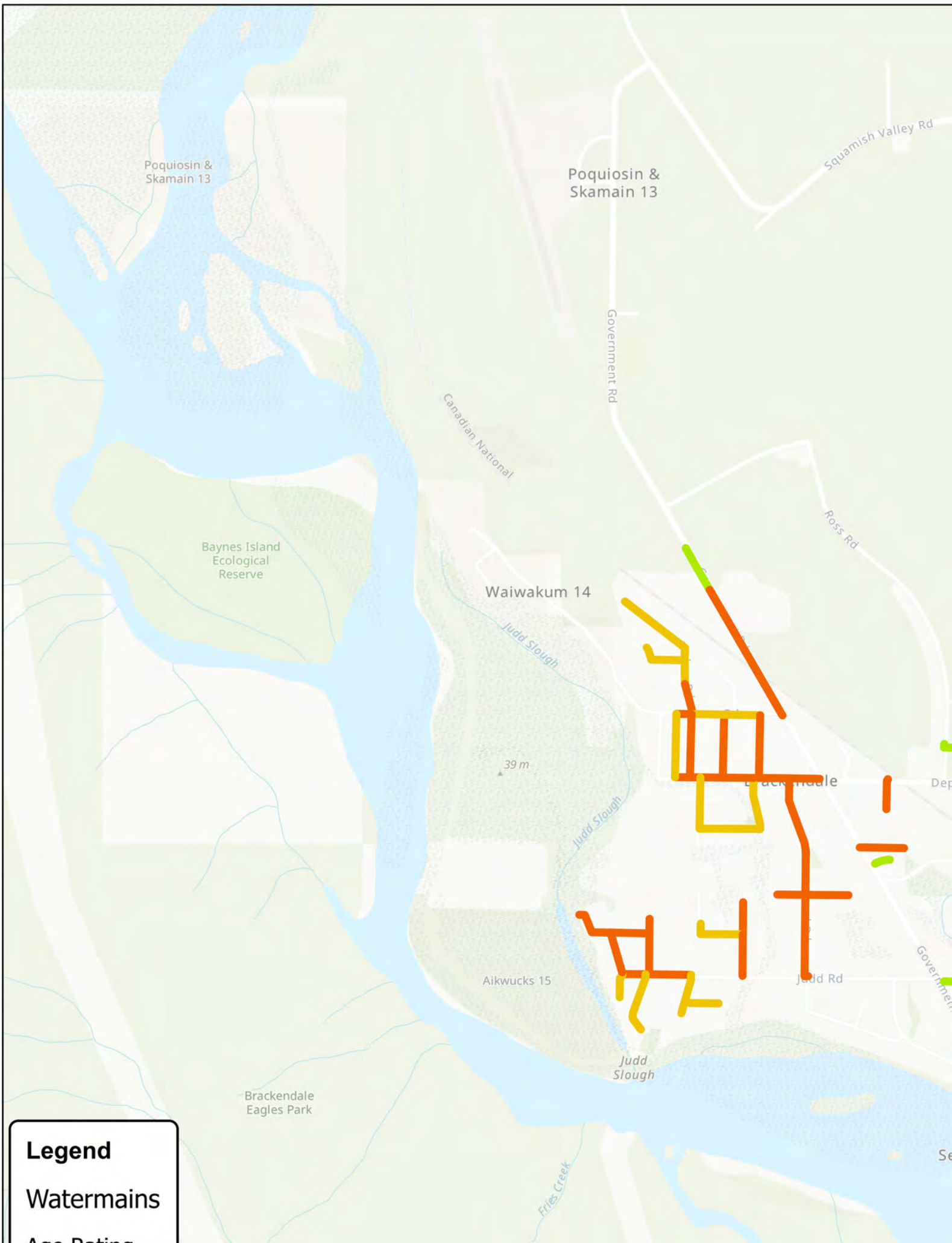
Figure 2-1: AC Watermain age distribution (2022 Dataset)

This age distribution is further defined in Table 2-1 where each asset was rated from 1 to 5 based on its current age, with 1 being the lowest probability of failure and 5 being the highest probability of failure. Approximately 5% of the District’s AC watermains are now at or beyond 60 years of age and have exceeded their estimated useful life.

Table 2-1: Age rating rubric and statistical analysis for AC watermains, normalized for the 2022 dataset.

RATING	1	2	3	4	5
Level of Risk	Very Low	Low	Moderate	High	Very High
AC Watermains Age	<40 years	40-49 years	50-54 years	55-59 years	>60 years
Length (km)	0.1	21.0	13.3	7.7	0.8
Portion of system (%)	0.3	48.8	31.0	18.0	1.9

The majority of the District’s remaining AC watermain assets were installed in the 1960s and ‘70s. Accordingly, the majority of watermains (76%) received an age rating of 2 or 3. For reference, Figure 2-2 displays the age rating assigned to each AC watermain within the District.



Poquiosin & Skamain 13

Poquiosin & Skamain 13

Squamish Valley Rd

Government Rd

Canadian National

Ross Rd

Baynes Island Ecological Reserve

Waiwakum 14

Judd Slough

39 m

Judd Slough

Brackendale

Aikwucks 15

Judd Rd

Judd Slough

Brackendale Eagles Park

Fries Creek

Legend
Watermains
Age Rating

2.2.2 PRESSURE RATING

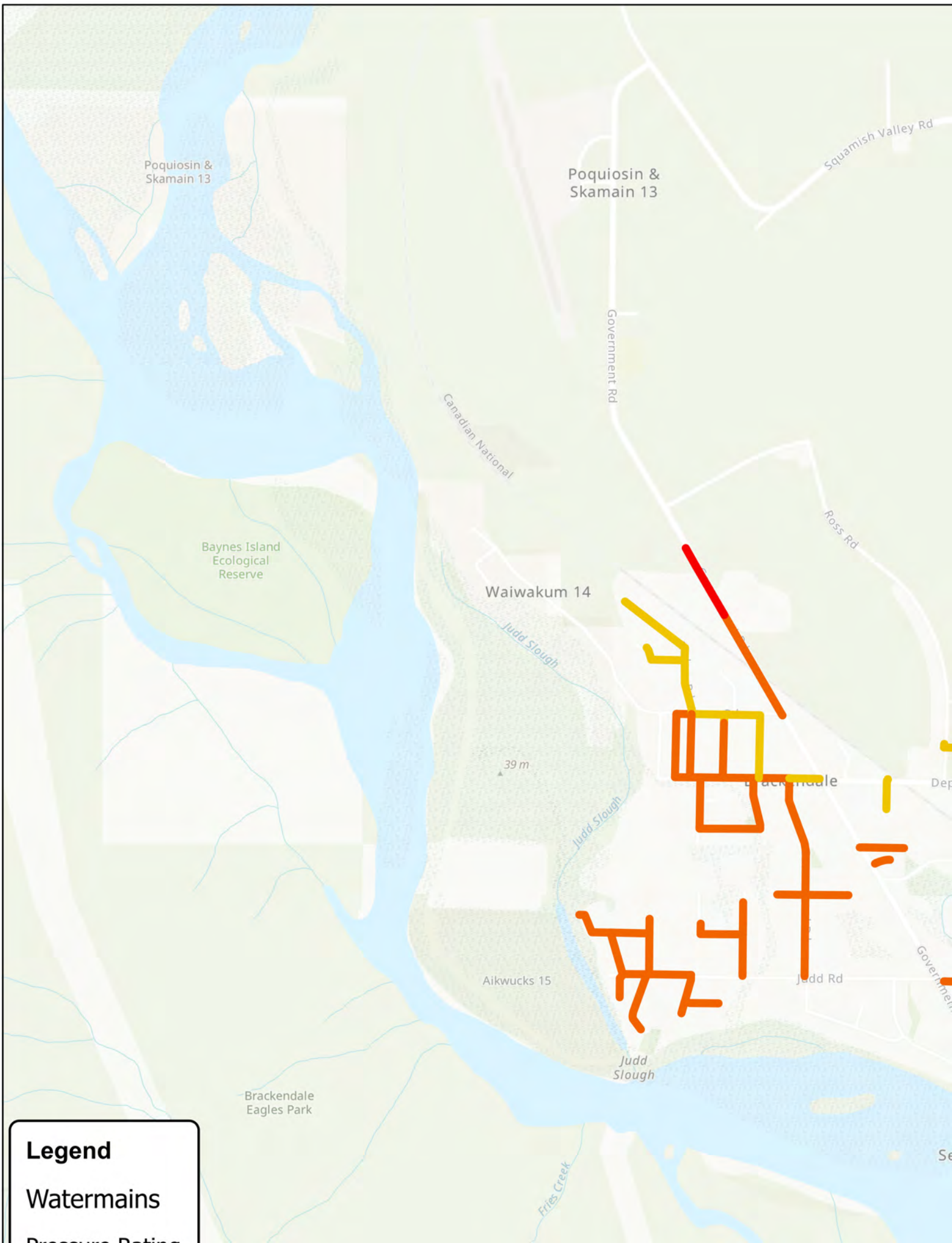
When in use, all types of watermains operate as part of a pressurized system. Routinely higher water pressures result in higher levels of wear and tear on a watermain and accordingly, result in more breaks. Therefore, the probability of failure increases in watermains with higher than typical operating pressures.

The maximum operating water pressures from the modelled ADD scenarios were compared. To ensure a conservative estimate, the average water pressure on each end of the watermain was used to evaluate its probability of failure pressure rating score. Table 2-2 presents the rating scale used for each AC watermain in the distribution network. The criterion used is the same as in the 2015 AC Watermain Renewal Plan.

Table 2-2: Pressure rating rubric and statistical analysis for AC watermains

RATING	1	2	3	4	5
Level of Risk	Negligible	Low	Medium	High	Extreme
AC Watermains Pressure	<40 PSI	40-60 PSI	60-80 PSI	80-100 PSI	>100 PSI
Length (km)	1.6	2.3	7.4	25.7	5.9
Portion of system (%)	3.8	5.4	17.2	59.8	13.8

Upon analysis of the data, approximately 60% of the AC watermains are regularly exposed to pressures that fall within rating 4. Approximately 91% of the AC watermains within the District are rated 3 and above. Figure 2-3 below presents the rating assigned to each AC watermain within the District.



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Fries Creek

Legend
Watermains
Pressure Rating

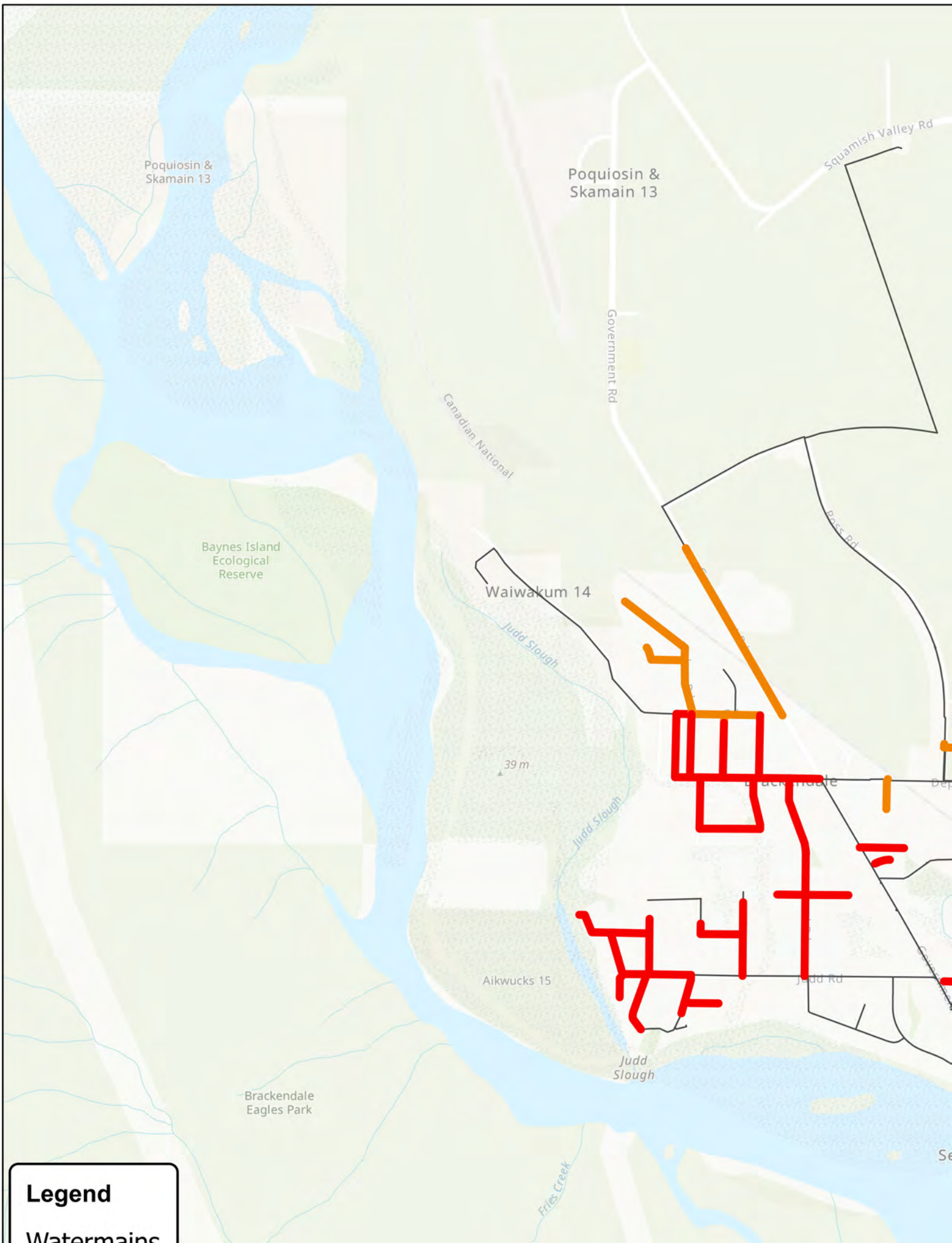
2.2.3 SOIL RATING

The soils within the District of Squamish have been classified into five categories based on shear wave velocity, as defined by the American National Earthquake Hazards Reduction Program (NEHRP). Although this data is meant to identify shaking hazards during an earthquake based on soil profiles, it has use in predicting the probability of failure of AC watermains. Softening of the wall and overall deterioration of AC watermains are affected by the water saturation level in surrounding organic soils with low pH. The presence of water leaches out the calcium, which in turn leads to softening of the wall structure. Using the soil map and slightly modified descriptions for each soil type, the 2015 AC Watermain Renewal plan generated a rating scale for soil type. Table 2-3 illustrates this system, which was used in this update identically.

Table 2-3: Soil rating rubric and statistical analysis for AC watermains

RATING	1		2	3	4
Level of Risk	Very Low		Low	Moderate	High
AC Watermains Soil Profile	A	B	C	D	E
Description	Hard, Igneous rock	Bedrock	Very dense soils and soft rock	Stiff soils - sands, gravels, silts, and mud	Soft, saturated soils and artificial fill
Length (km)	-	0.7	2.7	33.1	6.5
Portion of system (%)	-	1.6	6.2	77.1	15.1

The soils profile map of the District has been updated to reflect the repairs of AC watermains since 2015. Figure 2-4 below presents the soil ratings applied to the AC watermains.



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Brackendale Eagles Park

Fries Creek

Legend
Watermains

2.2.4 COMBINED PROBABILITY OF FAILURE

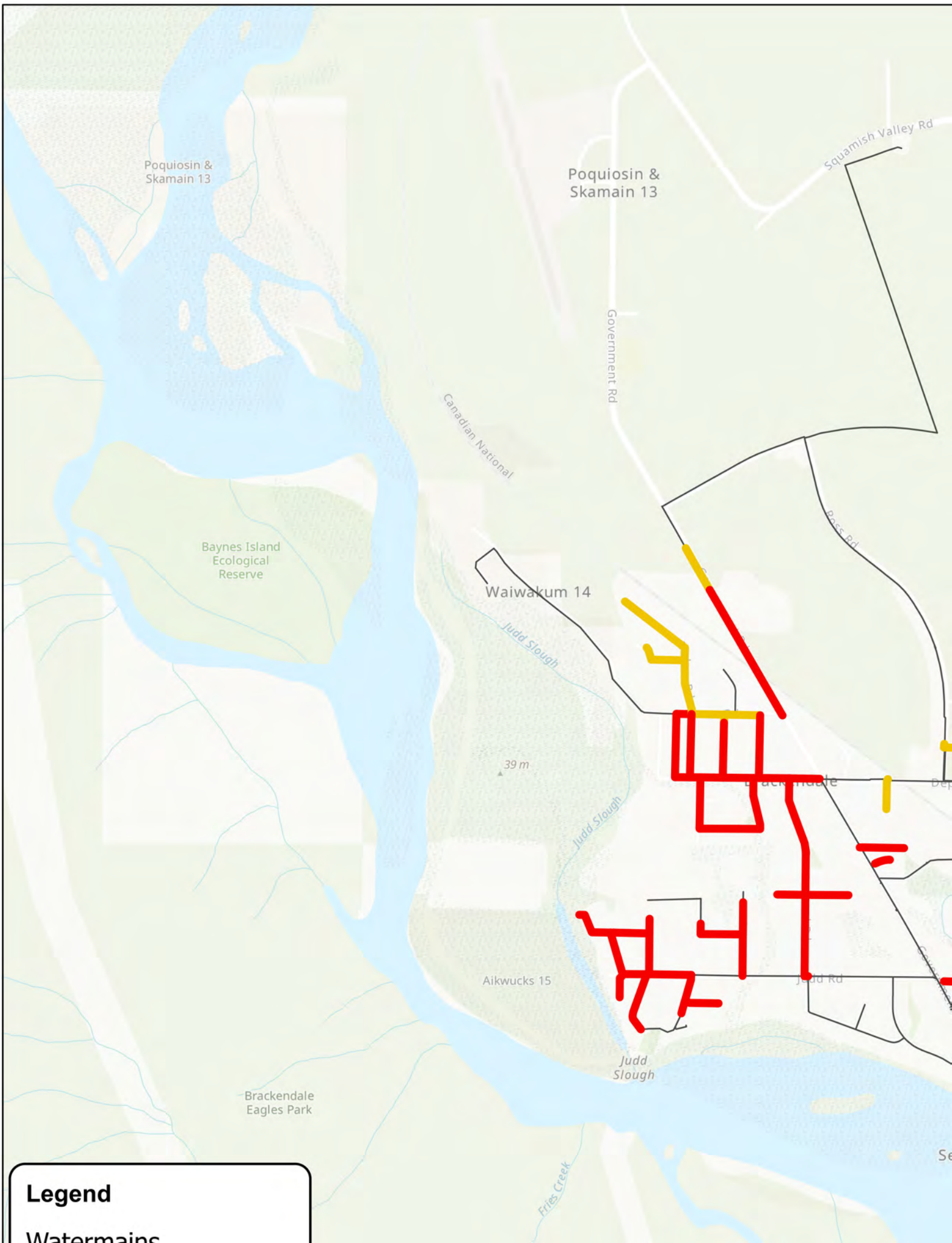
The combined average of age, pressure, and soil type ratings yielded a probability of failure ranking for each AC watermain. The possible probability of failure scores ranged from 1 to 5, with 1 expressing only a remote chance of failure, and a 5 representing imminent failure within the next five years. Table 2-4 presents the distribution of all probability of failure scores considering the total lengths of all AC watermain segments.

Table 2-4: Probability of failure rubric and statistical analysis of AC watermains

LEVEL OF RISK	REMOTE	UNLIKELY	MODERATE	PROBABLE	IMMINENT
Score	1	2	3	4	5
Length (km)	-	3.8	29.3	9.9	-
Portion of System (%)	-	8.7	68.2	23.1	-

Note: the combined probability of failure assumes altered age rating, see section 2.2.1

The previous 2015 analysis of AC watermains demonstrated that 15% were moderate (3), 84% were probable (4), and 1% were imminent for failure. For reference, Figure 2-5 below highlights the AC watermain's overall probability of failure.



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Fries Creek

Legend

Watermains

2.2.5 BREAK HISTORY ANALYSIS

Break history records from 2015 onwards were provided by the District through field reports. Street names, dates, and the type of breaks were mentioned in the files provided, allowing for a rough comparison of break history to the probability of failure distributions found through this study.

Figure 2-6 summarizes all the recorded watermain breaks in the District categorized into the watermain's probability of failure assessment as determined by the current study. This comparison was made to determine whether the rating system for the probability of failure is corroborated by the history of watermain breaks.

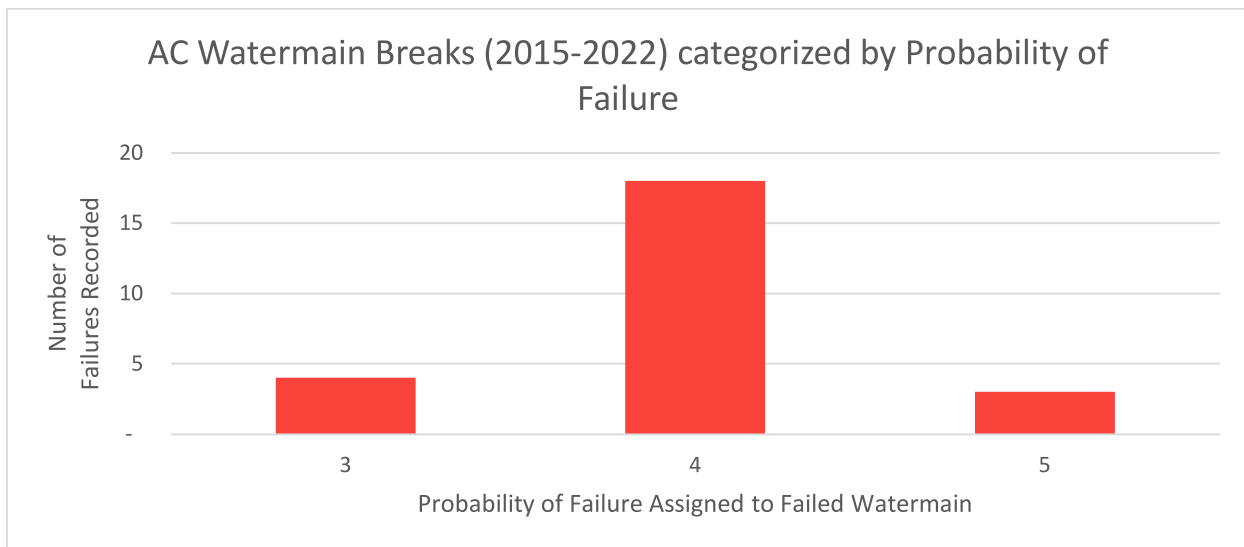


Figure 2-6: Statistical analysis of AC Watermain breaks within the District of Squamish from 2015-2022, categorized by Probability of Failure

Close scrutiny of Figure 2-6 suggests that historic watermain breaks represent a uniform probability distribution irrespective of the assigned probability of failure score. This is evident when you consider that the percentage of watermains with assigned probabilities scores of 3, 4, and 5 is approximately the same as the percentage of breaks. (i.e. 4 out of 25 watermain breaks, or approximately 16% of breaks, occur in watermains that have a probability score of 3, which is equivalent to 23% of the system by total length. Similarly, 18 of the 25 watermain breaks, or 72% of breaks, occur in watermains that are 4, which represent 66% of the system by total length.

Figure 2-7 attempts a simpler analysis and to understand the break history data in terms of watermain age. Disregarding breaks that occur in watermains of 45 years of age and under, the break history data presented in Figure 2-7 suggests a normalized probability distribution of failure, with an average age of 51 years for failed watermains.

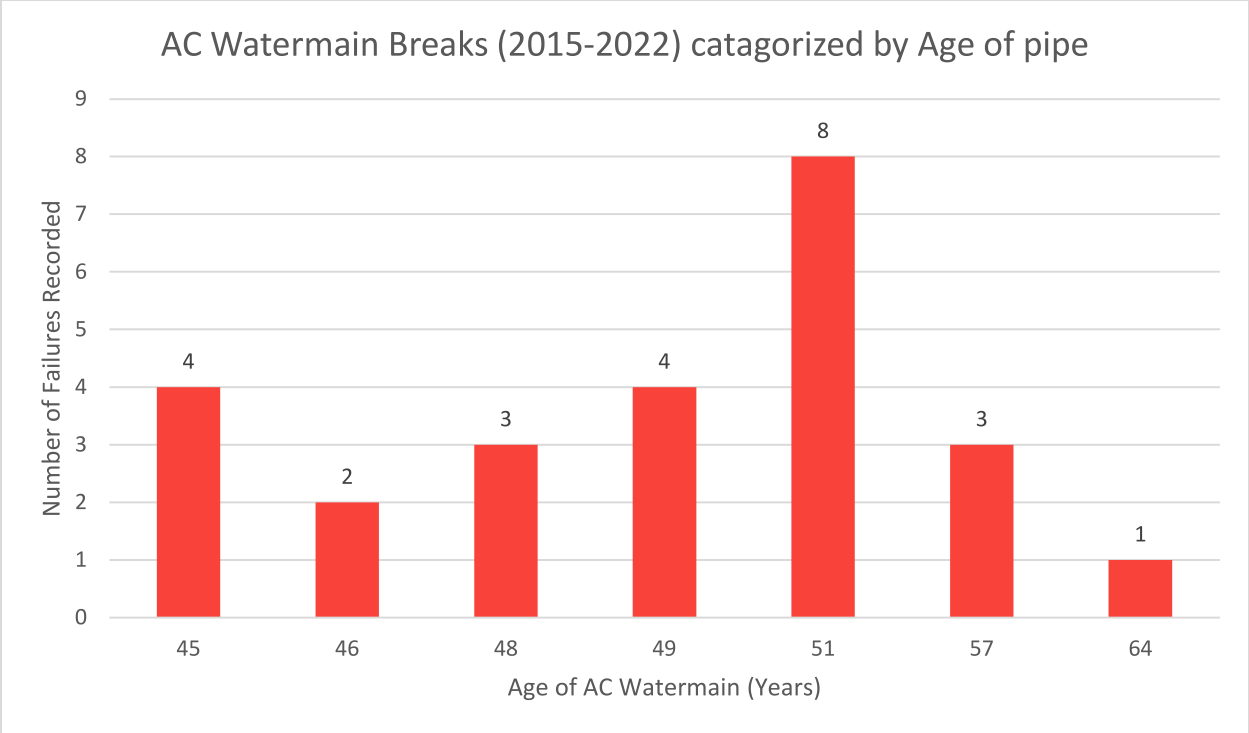


Figure 2-7: Statistical analysis of AC Watermain breaks within the District of Squamish from 2015-2022, categorized by Watermain Age

While the break history data supports a 50-year expected life for AC watermains, the analysis suggests a limitation with the revised age rating introduced in this update. Altering the age rating scale (which has a follow-on effect for the overall probability of failure) introduces greater granularity for prioritization, but this is a superficial change only; aging watermains greater than 60 years are likely to fail at the same rate. However, given the small sample size and the relatively recent reporting window, no concrete conclusions can be inferred from these findings. WSP recommends that the District continue to collect additional break records to corroborate these conclusions.

2.3 CONSEQUENCE OF FAILURE

The consequence of failure rating quantifies the impact of a particular asset’s failure on the system as a whole. For example, if a watermain along Alder Place in residential Squamish fails, then the impacts will be much lower than if a watermain along Powerhouse Springs Road were to fail. Notwithstanding the changes that result from development, the consequence of failure of an asset does not vary significantly throughout its operational life.

The consequence of the failure rating system used in the 2015 AC Watermain Renewal Plan was adopted from the 2011 Asset Management Plan. For consistency, this same consequence of the failure rating scheme was used in this update. Accordingly, the consequence ratings, which are retained from previous plans, do not consider development that has occurred since 2011. A summary of the consequence of failure rubric carried over from 2011 is presented in Table 2-5. The only update is for costs, which were incremented to account for inflation since 2011.

Table 2-5: Rating Consequence of Failure rubric

RATING	1	2	3	4	5
Consequence	Minimal	Moderate	Significant	Severe	Catastrophic
Property/Environmental Damage	Asset only	<= \$7,000	<= \$70,000	<= \$700,000	> \$700,000
Loss of Life	None	None	Remote	Possible	Probable
Service Interruption	< 1% of system	< 5% of system	< 10% of system	< 50% of system	> 50% of system
Traffic Disruption	Localized	Neighbourhood	District-wide	Regional	Multiple Major
Asset Replacement Cost	\$7,000	\$70,000	\$700,000	\$7,000,000	Indeterminate

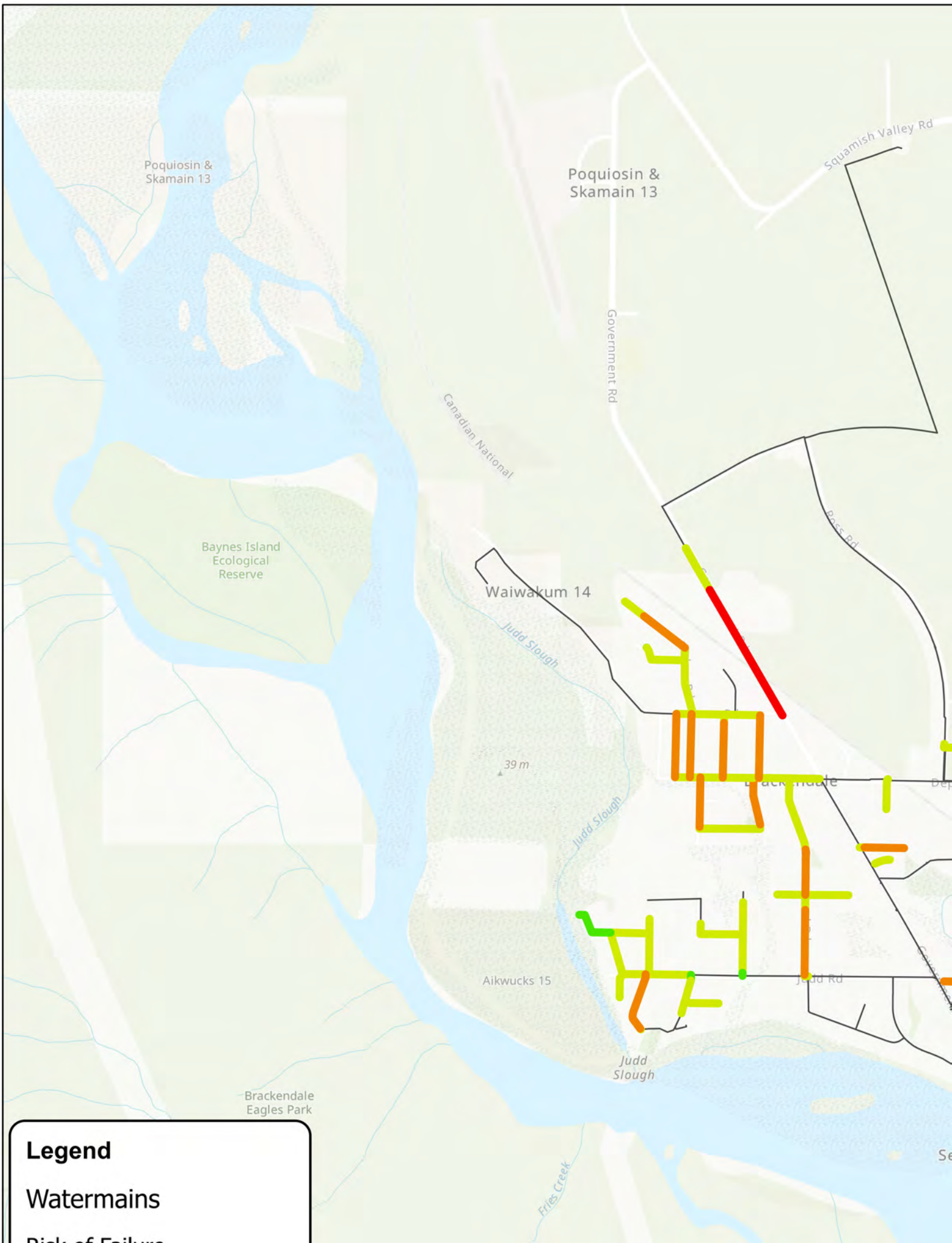
3 UPDATED RISK ANALYSIS

Risk in the context of reinvestment planning can be represented as a measure of the consequence of the asset’s failure combined with its probability of failure. For each AC watermain, the scores for probability and consequence of failure were multiplied to generate the risk score, in line with the approach taken by previous AC Renewal Plans. These results are summarized in Table 3-1, which depicts the distribution of risk in the AC watermain inventory. The assigned risk scores are indicative of the risk attributed to each of the AC watermains as they reach and surpass their expected service life of 60 years.

Table 3-1: Risk Distribution Rubric for AC Water mains, % of Total AC Watermain Length

		PROBABILITY				
		1	2	3	4	5
CONSEQUENCE	1	0%	0%	0.3% (0.1 km)	0.9% (0.4 km)	0%
	2	0%	0%	0.9% (0.4 km)	0.4% (0.2 km)	0%
	3	0%	2.3% (0.9 km)	26.7% (10.6 km)	9.4% (3.7 km)	0%
	4	0%	4.4% (1.7 km)	39.8% (15.8 km)	10.9% (4.3 km)	0%
	5	0%	2.0% (0.8 km)	0.3% (0.1 km)	1.6% (0.6 km)	0%

The risk scores are categorized into five levels based on the coloration of Table 3-1 which range from very low to very high risk. Each risk level triggers a unique remedial action. The majority of the District’s remaining AC watermains have a medium to high level of risk. However, these results should be understood in the context that 4.7% of the District’s AC watermains have exceeded their estimated useful life of 60 years, and that further deferral of replacements could cause disruption to service. As evidenced by the large number of AC watermains that remain in the medium (3) or high (4) consequence category, the District has many watermain assets pending replacement within the coming years. Roughly 26% of the AC watermains within this subset are of a high (4) probability of failure. Given the distribution of risk assigned to the AC watermains, the District should continue efforts to replace these watermains to avoid multiple failures in the near future. Figure 3-1 below highlights the risk score assigned to each AC Watermain.



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Judd Slough

Brackendale Eagles Park

Fries Creek

Legend

Watermains

Risk of Failure

4 UPDATED RENEWAL PLAN

WSP recommends that the AC watermain replacement program continues with a systematic approach to replace the highest consequence and most aging watermain first. Table 4-1 summarizes the suggested remedial actions for the planned replacements of the assets. Appropriate timeframes (in years) are provided to assist in the budgetary process for the District. These risk tolerance and the threshold levels that drive asset failure response and remedial action measures have been refined from the 2015 WMP.

Table 4-1: Risk Score & Recommended Action

RISK SCORE	DISTRIBUTION	RISK	ACTION
<3	0.3% (0.1 km)	Very Low	None, failure not expected
4-8	9.0% (3.6 km)	Low	Replace at 70 years of service
9-15	78.2% (31.1 km)	Medium	Replace at 65 years of service
16-20	12.6% (5.0 km)	High	Replace at 60 years of service
25	0%	Very High	Plan for immediate replacement

Over the next fifteen years, WSP recommends that the District complete its replacement of the remaining high and medium-risk asbestos cement watermain, with priority given to opportunistic replacements and higher-risk assets.

The replacement of a large portion of the District’s drinking water network will require a continued significant capital expenditure. WSP used a unit rate approach to calculate the estimated expenditure for each watermain replacement or capital project. Cost estimates were updated based on the approach in the 2024 Water Master Plan, with unit costs calculated from relevant previous projects within the District of Squamish and WSP’s cost database. Table 4-2 presents the unit rates used to estimate the cost of capital improvement works. All unit costs were rounded to the nearest \$10 and are presented in 2024 constant dollars.

Table 4-2: Watermain Unit Rate Costs for Capital Improvement Projects

PIPE DIAMETER (MM)	UNIT COST (\$)	UNIT
75	980	Linear Metre
100	1,100	
150	1,230	
200	1,670	
250	1,970	
300	2,000	
350	2,140	
400	2,580	
500	2,680	

The unit rates above include an allowance of 30% for engineering fees and contingency. Where the replacement watermain requires upsizing or if the replacement is spurred by nearby development, the District may be able to use

development cost charges or grant funding to offset some of the watermain replacement costs. Developers may also directly cover the costs for watermain upgrades if their projects require such improvements.

The risk-based AC watermain renewal plan prioritizes the replacement of high-risk watermains at the end of their expected service life of 60 years. Medium-risk watermain replacements have been deferred by 5 years (to a service life of 65 years) and low-risk watermain replacements have been deferred by 10 years (to a service life of 70 years). Table 4-3 summarizes this approach in a tabulated format.

Table 4-3: Revised Watermain Service Life

RISK	# OF YEARS DEFERRED	REVISED SERVICE LIFE
Low Risk	+10 years	70 years
Medium Risk	+5 years	65 years
High Risk	+0 years	60 years

The risk-based approach to AC watermain renewals allows for deferring low-risk watermains, prioritizing more critical mains, and allowing the District to finance other critical infrastructure projects (e.g. capital upgrades and supply upgrades, as detailed in the 2024 WMP Update). However, it should be noted that as the District’s AC watermain infrastructure ages, a significant portion of the low risk watermains will be coming up for replacement in the 2040 to 2060 time horizon, as illustrated in Figure 4-1. It is recommended that the AC Renewal Program and the overall Capital Projects list from the WMP be reviewed and updated regularly at a minimum 5-year interval to review and reprioritize infrastructure spending needs.

Based on the desktop risk analysis developed from the refined probability of failure analysis, the preliminary AC watermain renewal plan was developed and is illustrated in Figure 4-1. The AC watermain renewal plan defers low-risk projects for replacement beyond 2041.

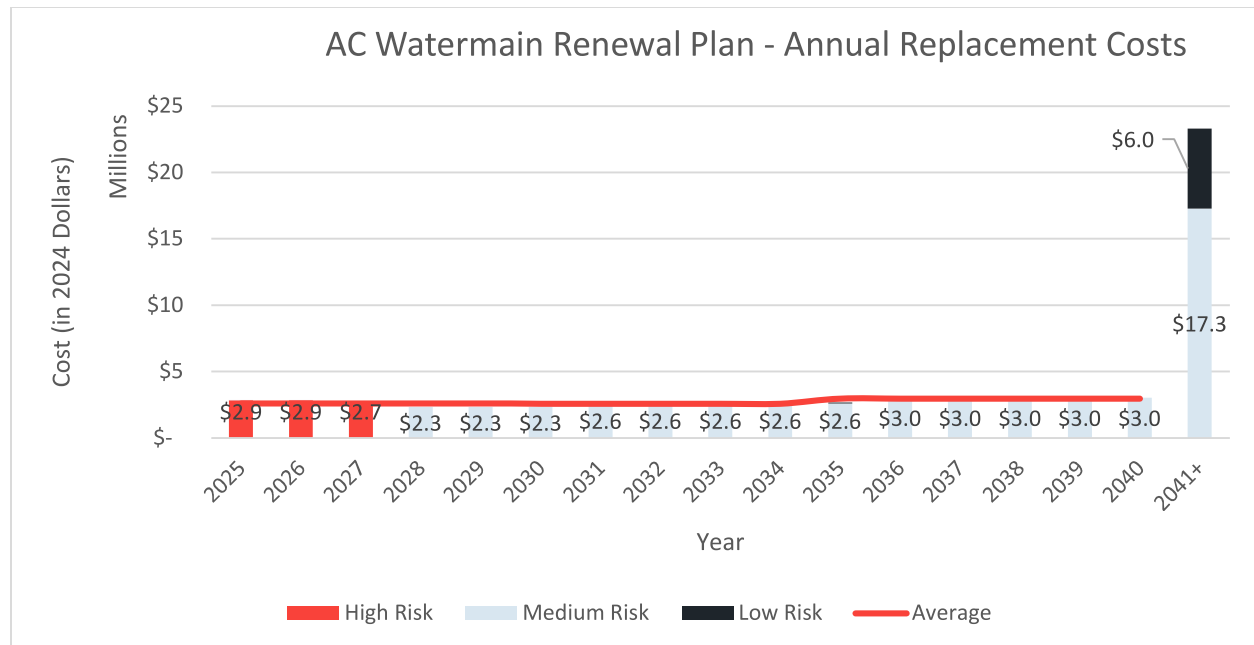


Figure 4-1: Preliminary AC Watermain Renewal Plan

By deferring low-risk AC watermain renewals by 15 years (start replacement by 2041), the total cost for replacing high-risk and medium-risk AC watermains is \$43.9 million over the next 15 years (2025-2040), replacing 26 km of watermains. The previous plan projected \$22.5 million over 16 years (2014 – 2030), replacing 60.2 km of

watermain. The cost increase between the two plans is primarily due to the large increase in construction costs since the previous plan was prepared.

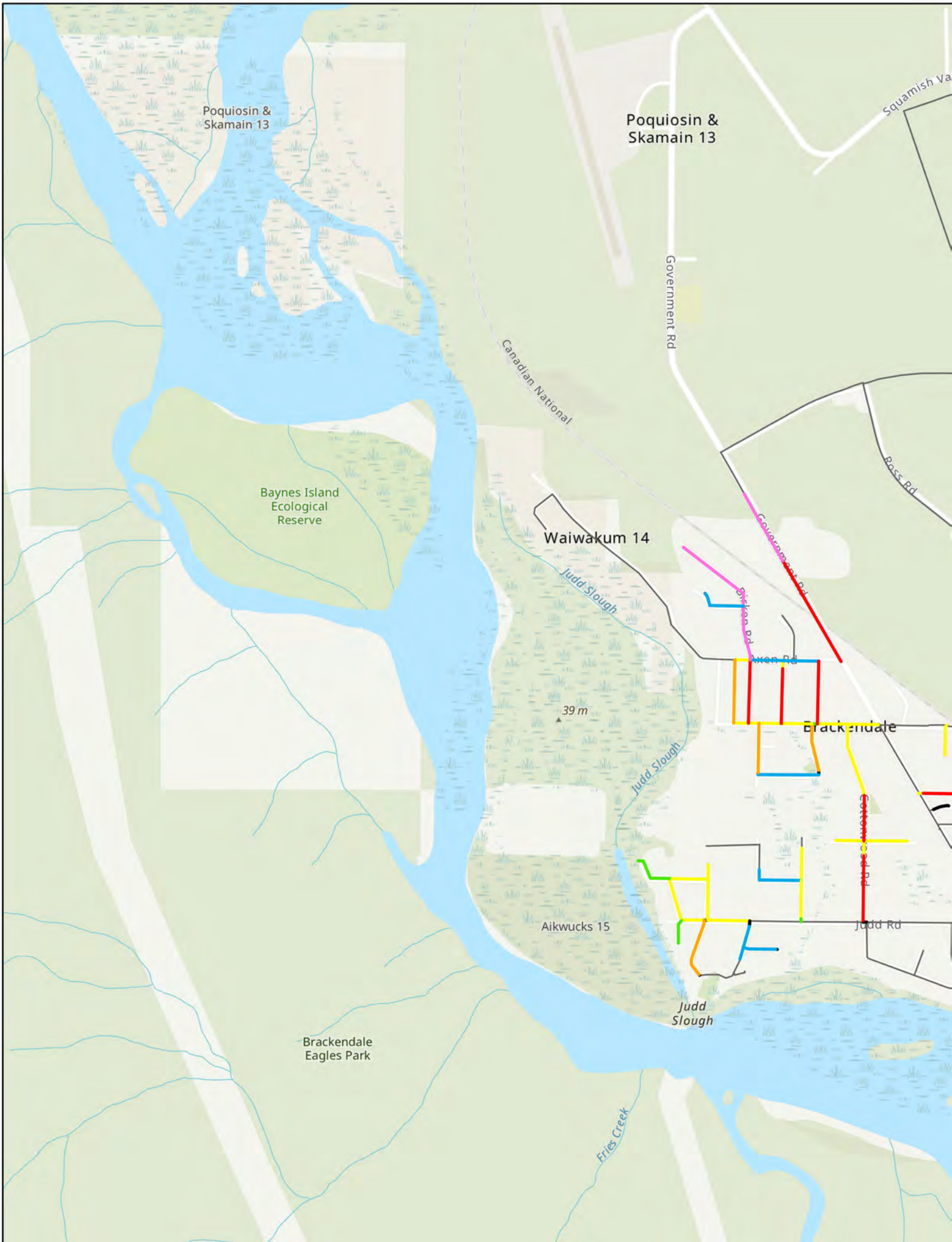
The estimated total reinvestments over three time periods of the plan, from 2025 to 2041, are summarized in Table 4-4. Note that all costs are in 2024 constant dollars.

Table 4-4: Approximate Reinvestments Required (in 2024 constant dollars)

REPLACEMENT PERIOD	RISK RATING	RISK RATING	RISK RATING	AVERAGE ANNUAL COST OVER PERIOD (\$/YEAR)	GRAND TOTAL (\$)
	Low	Medium	High		
2025-2029	-	\$4,707,997	\$8,369,050	\$2,615,409	\$13,077,047
2030-2034	\$248,496	\$12,723,221	-	\$2,594,343	\$12,917,717
2035-2040	\$62,124	\$17,814,782	-	\$2,979,484	\$17,876,906
2041+ (2041-2049)	\$6,030,370	\$17,272,480	-	\$2,589,206	\$23,302,850
					\$67,228,520

After 2041, replacing low-risk and the remaining medium-risk pipes will incur an additional total cost of \$23.3 million. This replacement is anticipated to span 9 years, from 2041 to 2049, with an estimated annual cost of approximately \$2.6 million.

Figure 4-2 highlights the suggested upgrades prioritized by risk through to 2041. High Risk AC mains due for renewal in the next two years were prioritized for Immediate Replacement in 2025 to 2026. The remaining High Risk AC mains in the network have estimated end of service lives varying from 2030 to 2037, however to smooth out average annual expenditures and mitigate potential high risk watermain failures, these High Risk AC mains have been front loaded to 2027. Medium Risk AC mains were then prioritized depending on when they reached their estimated end of life and to maintain a consistent annual expenditure, broken down into three periods: 2028 to 2030, 2031 to 2035, and 2036 to the end of 2040. The remaining AC mains in the network are shown as coming up for replacement in 2041 and beyond. The proposed renewal schedule should be regularly reviewed against other District infrastructure projects for any efficiencies.



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Brackendale Eagles Park

Judd Slough

Fries Creek

5 CLOSURE

This report presents a risk analysis developed from a refined probability of failure analysis specific to the AC watermain inventory within the District. An analysis of the age distribution of the District's AC watermains shows that 4.7% of these watermains are 60 years or older and have reached or exceeded their estimated useful life. 48% of the watermains are beyond 50 years old and are nearing the end of their estimated useful life. This suggests that the strategic renewals of critical and very high and high-risk AC watermains have been largely successful to date but are surpassing their usefulness. The District is on the verge of a new era where its AC watermains are aging and require consistent replacement.

The AC watermains have been prioritized by a risk rating which will allow for capital expenditures to be earmarked for higher-risk assets in the District's system. Currently, with the updated age rating, the majority of AC watermains are classified as medium or high risk and have been prioritized for replacement within 15 years, at a total estimated expenditure of \$43.6 million. Deferring low-risk watermain replacement allows for prioritizing more critical mains and for the District to finance other critical infrastructure projects (e.g. capital upgrades and supply upgrades, as detailed in the 2024 WMP Update). However, it should be noted that as the District's AC watermain infrastructure ages, a significant portion of the low-risk watermains will be coming up for replacement in the 2040 to 2060 time horizon, as illustrated in Figure 4-1. It is recommended that the AC Renewal Program and the overall Capital Projects list from the WMP be reviewed and updated regularly at a minimum 5-year interval to review and reprioritize infrastructure spending needs.

The priority high-risk and medium-risk AC renewals have been incorporated into the Capital Projects List of the 2024 WMP Update.

6 BIBLIOGRAPHY

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<https://www.awwa.org/Portals/0/AWWA/Government/BuriedNoLonger.pdf?ver=2013-03-29-125906-653>

APPENDIX

D WATER & SEWER UTILITIES RATE STUDY



WATER & SEWER UTILITY RATE STUDY

District of Squamish

WSP Project No. CA0013971.2174-CA-2023

December 06, 2024

Final Report Prepared for District of Squamish



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Water & Sewer Utility Rate Study

District of Squamish

Final Report

PROJECT NO.: CA0013971.2174-CA-2023

DATE: December 06, 2024

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December 06, 2024

District of Squamish
37955 2 Ave
Squamish, BC V8B 0A3

Attention: David Roulston, Manager of Municipal Infrastructure

Dear Mr. Roulston:

Subject: Water & Sewer Utility Rate Study

WSP Canada Inc. (WSP) is pleased to submit our Final Report for the District of Squamish Water & Sewer Utility Rate Study. The study includes a comprehensive review of the existing rate structure and projects rates into the year 2028 to assist the District in funding the water & sewer utilities for years to come. We recognize the importance of maintaining self-sustaining public utilities.

Kind regards,

A handwritten signature in black ink, appearing to read 'Michael Levin', is written over a light blue rectangular background.

Michael Levin, P.Eng. (BC), PMP
Project Manager, Water & Wastewater, BC

WSP ref.: CA0013971.2174-CA-2023

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0	Issued as Draft	Ian Moran B.Eng. PMP	Kenneth Brezinski Ph.D., M.Sc.	Michael Levin P.Eng. (BC), PMP	2024-03-07
1	Issued as Draft (Updates to Assumptions)	Ian Moran B.Eng. PMP	Kenneth Brezinski Ph.D., M.Sc.	Michael Levin P.Eng. (BC), PMP	2024-03-21
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3	Issued as Draft (Addressed Client Comments)	Ian Moran B.Eng. PMP	Michael Levin P.Eng. (BC), PMP	Michael Levin P.Eng. (BC), PMP	2024-11-05
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7	Final Report	Ian Moran B.Eng. PMP	Michael Levin P.Eng. (BC), PMP	Michael Levin P.Eng. (BC), PMP	2024-12-04

SIGNATURES

PREPARED BY



Ian Moran, B.Eng., PMP
Process Designer, Water & Wastewater

December 06, 2024

Date

REVIEWED AND APPROVED BY



The seal is circular with a double border. The outer border contains the text 'PROFESSIONAL' at the top and 'ENGINEER' at the bottom. The inner border contains 'PROVINCE OF' at the top and 'BRITISH COLUMBIA' at the bottom. In the center, it reads 'M. LEVIN # 48883'. Below the seal, the date '2024-12-06' is printed.

Michael Levin, P.Eng. (BC), PMP
Project Manager, Water & Wastewater
PERMIT NUMBER: 1000200

December 06, 2024

Date

WSP CANADA INC. 2024-12-06
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The report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.

The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

WSP disclaims any obligation to update this report if, after the date of this report, any conditions appear to differ significantly from those presented in this report; however, WSP reserves the right to amend or supplement this report based on additional information, documentation or evidence.

WSP makes no other representations whatsoever concerning the legal significance of its findings.

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This limitations statement is considered an integral part of this report.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1 INTRODUCTION.....	1
1.1 Community Background.....	1
1.2 Purpose	1
1.3 Project Overview	1
2 REVIEW OF EXISTING DATA AND DOCUMENTATION.....	2
2.1 General Population and Infrastructure Metrics	2
2.1.1 Population	2
2.1.2 Water Demand Data.....	2
2.1.3 Overview of Connections.....	3
2.1.4 Fees and Charges Bylaw	3
2.2 Additional Metering Information	5
2.3 Audited Financial Statements	10
2.4 Stepped Rate Structure	12
3 RATE STUDY.....	14
3.1 Approach.....	14
3.2 Assumptions.....	14
3.3 Model Calibration	15
3.4 Customer Connection Projections	21
3.5 Population and Water Demand Projections	23
3.6 Revenue and Expenses Projections	24
3.7 Utility Rate Projections	27
3.7.1 Metered Rates.....	27
3.7.2 Unmetered Rates	32
4 DISCUSSION	37
4.1 Implementation Challenges & Strategies	37



4.2	Universal Metering	38
4.2.1	Social Benefits	38
4.2.2	Sustainability	39
4.2.3	Resiliency	39
4.2.4	Financial Factors	39
4.2.5	Cost of Development	39
5	SUMMARY & RECOMMENDATIONS	40
5.1	Summary	40
5.2	Recommendations	40

TABLES

Table 1: One-step utility rates for metered customers from 2025 to 2029.	1
Table 2: Quarterly six-step utility rates for both metered consumers from 2025 to 2029.....	1
Table 3: District of Squamish population projections until the year 2028.	2
Table 4: District of Squamish water demand projections until the year 2028.	3
Table 5: Flat rate billing structure for single-family residential units.....	3
Table 6: Utility rate structure for metered ICI customers.	4
Table 7: Utility rate structure for metered multi-family residential building customers.	4
Table 8: 2023 water & sewer rates for unmetered customers.	6
Table 9: Summary of water utility funding and financial assets from Audited Financial Statements from 2019 to 2023.....	10
Table 10: Summary of water utility annual operating revenues and expenses from 2019 to 2023.....	10
Table 11: Summary of sewer utility funding and financial assets from Audited Financial Statements from 2018 to 2022.	11
Table 12: Summary of sewer utility annual operating revenues and expenses from 2018 to 2022.....	11
Table 13: Considerations for decreasing, maintaining constant, and increasing water unit rates at higher usages.....	12
Table 14: 2023 water utility rates for Abbotsford, BC.	13
Table 15: 2022 water utility rates for Salmon Arm, BC.	13
Table 16: Summary of connection name and estimated number of sub-connections.	15
Table 17: 2023 summary of metered and unmetered water & sewer connections by classification.	16
Table 18: Estimated percent connection size by connection classification.	18
Table 19: Classification capacity ratios for meter sizes.	19



Table 20: Classification REUs for unmetered connections.	19
Table 21: Total number of connections by classification from 2022 to 2029.	21
Table 22: Projected total customer connections per connection size.	22
Table 23: Projected metered customer connections per connection size.	22
Table 24: Projected unmetered customer connections per connection size.	23
Table 25: Metered and unmetered connections from 2022 to 2029.	23
Table 26: Population and water usage projections from 2022 to 2029.	23
Table 27: Projected annual water sales from 2022 to 2029.	24
Table 28: Combined anticipated administrative expenses for the water & sewer utilities from 2024 to 2029.	25
Table 29: Summary of relevant water utility revenues and expenses from 2025 to 2029.	25
Table 30: Summary of relevant sewer utility revenues and expenses from 2025 to 2029.	26
Table 31: One-step utility rates for metered customers from 2025 to 2029.	27
Table 32: One-step annual charges per connection size for 2025.	28
Table 33: One-step annual charges per connection size for 2026.	28
Table 34: One-step annual charges per connection size for 2027.	28
Table 35: One-step annual charges per connection size for 2028.	29
Table 36: One-step annual charges per connection size for 2029.	29
Table 37: Six-step utility rates for both metered and non-metered consumers from 2025 to 2029.	30
Table 38: Six-step annual charges per connection size for 2025.	31
Table 39: Six-step annual charges per connection size for 2026.	31
Table 40: Six-step annual charges per connection size for 2027.	31
Table 41: Six-step annual charges per connection size for 2028.	32
Table 42: Six-step annual charges per connection size for 2029.	32
Table 43: REU commodity rates for non-metered customers from 2025 to 2029.	33
Table 44: Percent increases in water and sewer utility rates from 2025 to 2029.	33
Table 45: Proposed unmetered water & sewer rates by classification from 2024 to 2029.	34

FIGURES

Figure 1: City of Mission unit rate per cubic meter of water per quarter for commercial/industrial/institutional and multi-unit residential connections in 2023.	13
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APPENDICES

- A** Audited Financial Statements
- B** Fees and Charges Bylaw

EXECUTIVE SUMMARY

WSP was engaged by the District of Squamish (District) to assess the short-term financial needs of the water & sewer utilities, as well as some of the non-financial factors such as total water usage and customer equity. WSP has prepared a single-step and multi-step water and sewer utility rate structure until the year 2029 including such factors as anticipated capital costs and ongoing revenues and expenditures. Single-step and multi-step rate structures were prepared to allow for comparison between the two options. The model was calibrated against existing population and demand metrics and projected future rates using five previous years of audited financial statements and other information provided by the District.

The financial model calculated water & sewer rates for both metered and unmetered customers and integrated the findings into the District’s existing customer classification system. For baseline comparison to the existing and proposed multi-step rate structures, a single-step rate structure was prepared and is summarized in **Table 1**.

Table 1: One-step utility rates for metered customers from 2025 to 2029.

	2025	2026	2027	2028	2029
Water					
Unit Water Rate (per m ³)	\$1.33	\$1.35	\$1.37	\$1.39	\$1.42
Quarterly Service Charge	\$17.65	\$18.09	\$18.04	\$18.00	\$18.01
Minimum Quarterly Rate Charge	\$35.85	\$36.41	\$37.00	\$37.62	\$38.27
Average Quarterly Cost per Residential Connection	\$125.19	\$127.32	\$129.03	\$130.87	\$132.82
Average Annual Cost per Residential Connection	\$500.77	\$509.29	\$516.11	\$523.49	\$531.28
Sewer					
Unit Sewer Rate (per m ³)	\$1.66	\$1.70	\$1.74	\$1.78	\$1.82
Quarterly Service Charge	\$22.11	\$22.79	\$22.87	\$22.96	\$23.12
Minimum Quarterly Rate Charge	\$44.89	\$45.88	\$46.91	\$47.99	\$49.11
Average Quarterly Cost per Residential Connection	\$156.76	\$160.43	\$163.60	\$166.92	\$170.44
Average Annual Cost per Residential Connection	\$627.05	\$641.70	\$654.41	\$667.69	\$681.75

The proposed six-step rate structure was modeled after the City of Salmon Arm’s six-step water utility rate structure and two-step sewer utility rate structure. A summary of the multi-step rate structure is provided in **Table 2**. The one-step rates are also given in this table for ease of comparison.

Table 2: Quarterly six-step utility rates for both metered consumers from 2025 to 2029.

	2025	2026	2027	2028	2029
Water					
<i>1-Step Rate (for Reference)</i>	\$1.33	\$1.35	\$1.37	\$1.39	\$1.42
<i>First 100 m³</i>	\$1.24	\$1.29	\$1.33	\$1.37	\$1.41
<i>Next 300 m³</i>	\$1.36	\$1.42	\$1.46	\$1.51	\$1.55

	2025	2026	2027	2028	2029
<i>Next 300 m³</i>	\$1.50	\$1.56	\$1.61	\$1.66	\$1.71
<i>Next 300 m³</i>	\$1.65	\$1.72	\$1.77	\$1.83	\$1.88
<i>Next 300 m³</i>	\$1.81	\$1.89	\$1.95	\$2.01	\$2.07
<i>Over 1,300 m³</i>	\$1.99	\$2.08	\$2.14	\$2.21	\$2.27
Quarterly Service Charge	\$17.65	\$18.09	\$18.04	\$18.00	\$18.01
Minimum Quarterly Rate Charge	\$33.42	\$34.79	\$35.92	\$37.08	\$38.13
Average Quarterly Cost per Residential Connection	\$117.90	\$122.46	\$125.79	\$129.25	\$132.42
Average Annual Cost per Residential Connection	\$471.61	\$489.85	\$503.15	\$517.01	\$529.66
Sewer					
<i>1-Step Rate (for Reference)</i>	\$1.66	\$1.70	\$1.74	\$1.78	\$1.82
<i>First 100 m³</i>	\$1.63	\$1.67	\$1.72	\$1.77	\$1.81
<i>Over 100 m³</i>	\$1.79	\$1.84	\$1.89	\$1.94	\$2.00
Quarterly Service Charge	\$22.11	\$22.79	\$22.87	\$22.96	\$23.12
Minimum Quarterly Rate Charge	\$43.94	\$45.20	\$46.50	\$47.72	\$48.97
Average Quarterly Cost per Residential Connection	\$153.93	\$158.40	\$162.39	\$166.11	\$170.03
Average Annual Cost per Residential Connection	\$615.71	\$633.60	\$649.55	\$664.45	\$680.13

A projection of the District’s unmetered rates is given in **Table 45** of the report.

WSP proposes the following additional recommendations:

- 1 Further consultation to assess the needs of both the District and its customers to better assist with the transition to the proposed metered system. Some challenges and implementation strategies are:
 - a Review the existing billing software to assess its adaptability to the proposed new rate structure as well as the timeline for implementation.
 - b Consider implementing shadow billing to assess the performance of the new rate structure in the interim , particularly to determine whether the new rates generate sufficient revenue and are equitable for consumers. Consider adding shadow billing to current customer water and sewer utility bills and other incentivizing information.
 - c Consult with multi-purpose building owners to determine and effectively address challenges associated with the new billing structure. Previously, some meter owners did not pay for water, would then be required to do so, and will need support to adjust their sub-unit charges (i.e., rent).
 - d Consider implementations strategies for strata, noting that there is no one singular meter owner. While the most effective approach to conserving water is to install sub-meters for each sub-owner, it is an expensive approach. Alternatively, stratas can be managed on a case-by-case basis, or the historical rate structure can remain in place.
- 2 Consolidation of the water & sewer bylaws. If possible, remove the previous rate structure while noting that it may still be required in some cases (i.e., unmetered ICI customers where meter installation is infeasible).

- 3** Consider implementing a universal water metering program for all customers, including those in both ICI and single-family residential units. Although the direct costs to the District may be substantial, there are several indirect financial and other benefits that should be considered. Sub-components of this could include:
 - a** Performing a cost/benefit analysis of a residential metering program while the District gains experience with the new water & sewer rate structure. Opportunistically seek grants to fund the program, if pursued.
 - b** Support requiring new single family units to install meters.
 - c** Offer voluntary program where single family owners can install meters at their cost of installation.

1 INTRODUCTION

1.1 COMMUNITY BACKGROUND

Located at the northern tip of a glacially etched fjord on the Pacific Ocean in British Columbia, the District of Squamish (District) is surrounded by a mountain backdrop and is nestled within a temperate rainforest. Squamish is situated on the Sea to Sky Highway between Vancouver and Whistler. The District is rich with recreation, culture, and outdoor lifestyle activities.

Squamish is regarded for its wide range of outdoor recreational activities. It has a relatively mild year-round climate, a healthy wildlife population, and is located close to oceans, mountains, and rivers. Squamish is also home to a diverse arts and culture scene and the community is notably committed to maintaining the surrounding environments and ecosystems. The District offers public education through six elementary schools, a junior high school, and a high school.

Squamish hosts a variety of annual events such as Squamish Days Loggers Sports, the Farmer's Market and the GranFondo cycling event. In light of these (and many other events), the District facilitates high volumes of tourism and other occasional recreational users.

According to the most recent 2023 Statistics Canada population numbers, the population of Squamish was 29,206 persons.

1.2 PURPOSE

In continued efforts to provide fair and equitable water & sewer utility rates to consumers, the District expressed interest in completing a combined Rate Study for the water & sewer utilities. This study incorporates the information and findings of the Water & Sewer Capital Plan Project concurrently undertaken by WSP.

1.3 PROJECT OVERVIEW

WSP was engaged by the District to review the existing data & documentation pertaining to the water & sewer utilities (audited financial statements, water demand, by-laws, etc.) and propose a 5-year rate structure for the water & sewer utilities. The recommended rate structure is to accomplish the following objectives:

- Determine fair & equitable water & sewer utility rates for consumers.
- Provide self-sustainability of each of the utilities accounting for current and future projected capital expenditures as well as ongoing operating expenditures.

In addition to the above, the District requested that options be presented for single step and multi-step rate structures in order to allow for an evaluation and comparison of the options. In this approach, the unit cost of water changes as the water consumption increases. For comparative purposes, a one-step rate structure – where the water commodity rate is fixed at a single value – is also shown.

2 REVIEW OF EXISTING DATA AND DOCUMENTATION

The following information has been reviewed as part of this assessment:

- General population and infrastructure metrics publicly available or provided by the District;
- Audited Financial Statements from 2018-2023;
- Recent five-year financial plans and reports;
- Water and sewer bylaw;
- Recent Annual Drinking Water Quality Reports; and
- Additional information provided by the District.

2.1 GENERAL POPULATION AND INFRASTRUCTURE METRICS

2.1.1 POPULATION

According to the most recent 2023 Statistics Canada population numbers, the population of Squamish was 29,206 persons. A 4.0% population growth rate was adopted for this study. Population and private dwelling projections for the next 20 years are given in **Table 3**.

Table 3: District of Squamish population projections until the year 2028.

YEAR	2023	2024	2025	2026	2027	2028	2029
Population	29,206	30,398	31,638	32,930	34,274	35,672	37,128
Private Dwellings	12,146	12,642	13,158	13,695	14,254	14,836	15,441

2.1.2 WATER DEMAND DATA

The District has implemented many supply-side management tools over the years as part of their Long-Term Water Supply Strategy. Discussions of the three main management tools are provided below.

Water System Renewals and Upgrades

The District performs annual upgrades and replacements to the water distribution system. System maintenance and upgrades will continue in future years as per the District’s Asset Management Plan and Water Master Plan recommendations.

Water Conservation

An important factor considering the rate of growth of the community and aging infrastructure is the need to reduce per capita water consumption. The District recognizes the importance of reducing water consumption to assist in maintaining adequate water supply while reducing the substantial costs associated with building the required infrastructure to increase production and conveyance capacity. The District's Water Conservation Plan consumption reduction target is 20% by 2041.

Water Metering

Starting in 2017, the District utilized a grant assisted program to install water meters for historically unmetered ICI customers. Approximately 70 connections will not be equipped with a water meter due to high installation costs. All new industrial, commercial, and institutional (ICI) and multi-family buildings are required to have a water meter included in their construction.

Despite the water conservation efforts by the District, the average water usage is estimated as 457 Lcd, which is high compared to other nearby communities of similar size and scale – 180 Lcd in Abbotsford, 335 Lcd in the City of Mission, and 414 Lcd in Whistler. For each of these listed communities and for Squamish, there appears to be a correlation between the percentage of unmetered users and demand.

For the purposes of this study, the per capita demand has been adopted as 457 Lcd (the median estimated water demand from 2018-2022). Estimated average day demand (ADD) is given in **Table 4**.

Table 4: District of Squamish water demand projections until the year 2028.

YEAR	2022	2023	2024	2025	2026	2027	2028	2029
ADD (MLD)	13.35	13.89	14.46	15.05	15.66	16.30	16.97	13.35

A universal metering program can have a major impact towards reducing water consumption rates and deferring required capital projects. Water metering programs in other regions have demonstrated reduced water consumption between 10% and 30%.

2.1.3 OVERVIEW OF CONNECTIONS

Water metering is one of the primary recommendations of the 2015 Water Master Plan to address water supply and consumption concerns in preparation for future growth. New single-family homes are required to install water meter boxes only, to facilitate future meter installation in the event that the District moves to universal metering in the years to come. The District plans to re-evaluate universal metering for residential properties in the future.

All newly constructed multi-family buildings in Squamish are required to install water meters. Multi-family properties will receive one meter per building, regardless of the number of serviced units in the building.

The District has recently installed water meters for multi-family buildings and ICI through provincial and federal grant funding. The District opted to first focus on large diameter water services first which often require additional engineering and construction. There are approximately 70 connections that will not be metered due to high installation costs.

The 2015 Water Master Plan recommended implementation of universal metering as a long-term goal for the District. Covering the cost of a universal metering program would likely mean significant rate increases to properties through Utilities fees – in the range of a 20 percent increase over a five-year implementation program.

2.1.4 FEES AND CHARGES BYLAW

The District bills water & sewer customers of single-family residential units based on a flat-rate billing structure, summarized in **Table 5**. Previous years' rates have been shown for comparative purposes.

Table 5: Flat rate billing structure for single-family residential units.

YEAR	WATER	SEWER
2022	\$490	\$615
2023	\$490	\$615
2024	\$500	\$635

For all other users (multi-family units, commercial, ICI, etc.), the District bills water customers based on the Fees and Charges Bylaw 2012, 2007 (as amended by Bylaw No. 2716, 2020). The Bylaw outlines the rates for both metered and unmetered users.

The utility rate structure for ICI metered users is summarized in **Table 6**. Note that the Bylaw outlines charges for these connections (such as for inaccessible meter readings, turning on/off water supply services, etc.) for which analysis is beyond the scope of this rate review and are not shown in the table below.

Table 6: Utility rate structure for metered ICI customers.

NO.	CLASSIFICATION	RATE STRUCTURE
1	Per cubic meters	\$0.79
	Minimum Monthly Charge for metered service	\$217.00
2	Monthly rent for meter, in addition to all above tolls:	
	Up to 3/4" meter	\$6.65
	Up to 1" meter	\$15.50
	Up to 1 1/2" meter	\$24.34
	Up to 2" meter	\$31.10
	Up to 3" meter	\$82.26
	Up to 4" meter	\$141.44
	Up to 6" meter	\$213.20
	Up to 8" meter	\$258.96
	Up to 10" meter	\$354.64

Metered multi-family residential buildings are charged based on the rate structure summarized in **Table 7**. Like the ICI connections, multi-family residential buildings are subject to additional non-usage-based charges.

Table 7: Utility rate structure for metered multi-family residential building customers.

NO.	CLASSIFICATION	RATE STRUCTURE
1	Minimum Base Rate - annual water usage less than or equal to 112 m ³ /apartment unit.	\$171.00
	For annual water usage greater than 112 m ³ /apartment unit. Per cubic meter.	\$1.52
2	For not for profit seniors housing; Minimum Base Rate - annual water usage less than or equal to 112 m ³ /apartment unit.	\$171.00
	For annual water usage greater than 112 m ³ /apartment unit. Per cubic meter.	\$152.00

Unmetered users are charged based on the schedules outlined in the Fees and Charges Bylaw for both water and sewer utilities. The rate structures are broken down by building classification and further by such criteria as use, size, onsite services, number of plumbing fixtures, etc. (in alignment with the business licence category or occupancy).

The classification system is dissimilar between the water and sewer rate structures. A general summary of the differences between the rate structure is given below:

- The classification numbering system is different (i.e. *Home Occupation* is listed as No. 6 in the water rate structure and No. 23 in the sewer rate structure);
- Some customers have separate accounts for water and sewer, rather than a combined account for both (i.e., Hospitals); and
- Some sub-classifications are different (i.e., *Dentist Offices* water charges are based on the number of seats whereas the sewer charges are based on the number of dentists, physicians, or surgeons).

The differences between the classification structure significantly increased the complexity of this Study. It is recommended that standard numbering and sub-classifications be adopted for water & sewer to assist in expediting similar future studies.

A summary of the water & sewer rates for the year 2023 for unmetered customers, normalized to the numbering system of the water rate structure, is given in **Table 8**. Note that for different sub-classifications between the water & sewer rate structures, the text has been greyed out or omitted to indicate the difference.

2.2 ADDITIONAL METERING INFORMATION

The District provided additional information on their metered connection in two excel files, generally outlining the following:

- A qualitative list of current and future metered connections, including the status of outstanding connections.
- A quantitative list of all metered connections via an export of the District’s Neptune 360 File Mapper.

The qualitative list was cross-referenced to confirm the number of remaining unmetered ICI connections, while the quantitative list was used to better calibrate the model (**Section 3.3**).

Table 8: 2023 water & sewer rates for unmetered customers.

WATER			SEWER		
NO.	CLASSIFICATION	RATE	NO.	CLASSIFICATION	RATE
	For all types of uses minimum charge Per classification		1	For all types of uses minimum charge Per classification	\$615.00
1	Single Unit Dwelling within/outside the boundaries of the District of Squamish, each unit	\$490.00	2	Single Unit Dwelling, each unit	\$615.00
2	Apartment, Townhouse, Fourplex, Triplex or Live-Work, each unit	\$490.00	3	Apartment, Townhouse, Fourplex, Triplex or Live-Work, each unit	\$615.00
3	Secondary Suite, Accessory Dwelling Unit, Multi-Unit Flex Unit, each unit	\$390.00	4	Secondary Suite, Accessory Dwelling Unit, Multi-Unit Flex Unit, each unit	\$490.00
4	Not for profit seniors housing, each unit	\$390.00	5	Not for profit seniors housing, each unit	\$490.00
5	Removed as per Bylaw 2958, 2023		6	Hospitals, each bed unit	\$305.00
6	Home Occupation		22	Removed by Bylaw 2958, 2023	
	- Beauty Parlours, Barber Shops, Health Spa & Services	\$490.00		- Beauty Parlours, Barber Shops, Health Spa & Services	
	- for each chair over one	\$240.00		- for each chair over one	
7	Home Occupation businesses except for those specifically listed	\$0.00	23	Home Occupation businesses except for those specifically listed	\$0.00
8	Tourist Accommodation, Hostel, Hotels, Motels, per Accommodation Unit		7	Tourist Accommodation, Hostel, Hotels, Motels, per Accommodation Unit	
	- With kitchen facilities	\$240.00		- With kitchen facilities - with bath	\$305.00
	- Without kitchen facilities	\$82.00		- Without kitchen facilities - with bath	\$245.00
	- Without kitchen facilities - without bath			- Without kitchen facilities - without bath	\$183.00
9	Barber Shops, Beauty Parlors & Health Spa and Services	\$490.00	20	Barber Shops, Beauty Parlors & Health Spa and Services	\$1,040.00

WATER

SEWER

NO.	CLASSIFICATION	RATE	NO.	CLASSIFICATION	RATE
	For each chair over one	\$240.00			
10	Café, Restaurant, Coffee Shop, Bakeries, Dining Room and Public Lounge and Cocktail Bar	\$630.00	9	Restaurants and Bakeries	\$1,040.00
	In addition, per seat	\$18.00		In addition, per seat	
11	Dentists	\$318.00	19	Dentist's, Physician's and Surgeon's offices With one dentist, physician or surgeon	\$1,040.00
	In addition for each chair	\$166.00		With more than one dentist, physician or surgeon	\$1,560.00
12	Greenhouses, Nurseries, Cannabis Production , Agriculture and Animal Farms not in any other category	\$795.00	25	Greenhouses, Nurseries, Cannabis Production , Agriculture and Animal Farms not in any other category	\$1,040.00
13	Pool Rooms with toilet and washroom facilities	\$633.00	18	Bowling Alleys, Pool Rooms, Curling Rinks Golf Courses and Club Houses	
	With snack bar			With snack bar	\$2,080.00
	Without snack bar			Without snack bar	\$1,040.00
14	Public Garages and Service Stations with less than		16	Public Garages and Service Stations with less than	
	- 1000 sq. ft. of retail	\$1,200.00		1000 sq. ft. of retail	\$1,310.00
	- In addition retail 1000-5000 sq. ft.	\$638.00		- In addition retail 1000-5000 sq. ft.	\$1,040.00
	- In addition retail over 5000 sq. ft.	\$955.00		- In addition retail over 5000 sq. ft.	\$1,530.00
	- In addition car wash for each bay/washing station	\$240.00		- In addition car wash for each bay/washing station	\$245.00
15	Church Halls and Church Residences (each)	\$490.00	14	Churches	\$615.00
	Church Halls (where separate from church)			Church Halls (where separate from church)	\$615.00

WATER

SEWER

NO.	CLASSIFICATION	RATE	NO.	CLASSIFICATION	RATE
16	Stores, Banks, Theatres, Offices, Office Buildings, Public Halls, Clubs, Medical Clinics, and all other commercial undertakings not specifically listed.		10	Retail stores, Commercial Halls, Banks, Theatre and all other commercial undertakings not specifically listed.	
	Less than 1000 sq. ft.	\$318.00		Less than 1000 sq. ft.	\$615.00
	1000 - 5000 sq. ft.	\$638.00		1000 - 5000 sq. ft.	\$1,040.00
	Over 5000 sq. ft.	\$955.00		Over 5000 sq. ft.	\$1,530.00
0	Office Buildings for each office		11	Office Buildings for each office	\$123.00
0	Offices for rent other than in an office building		12	Offices for rent other than in an office building	\$123.00
	Less than 1000 sq. ft. 1000 - 5000 sq. ft.			Less than 1000 sq. ft. 1000 - 5000 sq. ft.	\$638.00
	Over 5000 sq. ft.			Over 5000 sq. ft.	\$955.00
17	Laundries, except where on an industrial rating	\$1,585.00	15	Commercial Laundries, including Laundromats 1 to 6 washers	\$1,835.00
	Each additional washer			Each additional washer	\$305.00
18	Mills, Breweries, Wineries, Distilleries and other small industrial users.	\$1,585.00	8	Public House Licenses (Beer parlors, Breweries, Wineries, Distilleries)	\$3,670.00
19	Commercial Swimming pool and/or Hot tub(s)	\$793.00		Commercial Swimming pool and/or Hot tub(s)	
20	Campgrounds		24	Campgrounds	
	- centralized washroom, per un-serviced site	\$0.00		- centralized washroom, per un-serviced site	\$152.00
	- fully serviced, camp or recreational vehicle site	\$120.00		- fully serviced, camp or recreational vehicle site	\$305.00
	- sani-stations and or dump stations	\$490.00		- sani-stations and or dump stations	\$1,040.00
	- laundry facilities	\$1,585.00		- laundry facilities, per washer	\$305.00

WATER

SEWER

NO.	CLASSIFICATION	RATE	NO.	CLASSIFICATION	RATE
	- public washroom, per fixture	\$160.00		- public washroom, per fixture	
21	Machine Shops For each additional employee	\$1,430.00	21	Work Shops and Small Industries For the first 5 employees For each additional employee	\$1,040.00 \$93.00
22	Hospital or homes for aged or chronically ill For each rated bed capacity	\$128.00	22	Removed by Bylaw 2958, 2023	
23	School, per classroom	\$318.00	13	School, per classroom	\$615.00
0	Warehouses		17	Warehouses	
	With 1 to 5 employees			With 1 to 5 employees	\$615.00
	With more than 5 employees			With more than 5 employees	\$1,040.00
24	Temporary water Service during construction (Building size in square meters of gross floor area)				
	Up to and including 500	\$220.00			
	Over 500 but not exceeding 2,000	\$430.00			
	Over 2,000 but not exceeding 9,000	\$1,090.00			
	Over 9,000 but not exceeding 24,000	\$1,630.00			
	Over 24,000 but not exceeding 45,000	\$2,160.00			
			26	Blockage minimum A fee to recover actual cost to the Municipality for the clearing a sewer blockage. The blockage minimum fee plus actual costs of labour and equipment. The municipality must demonstrate that the sewer blockage was due to consumer or property owner and the fee can be charged to the consumer or property owner.	\$200.00

2.3 AUDITED FINANCIAL STATEMENTS

WSP reviewed the District’s Audited Financial Statements from the fiscal years of 2019 through 2023 (i.e., the five most recent of the District’s published statements). Information on the reserves, revenues, and expenses are summarized in **Table 9** and **Table 10** for the water utility and in **Table 11** and **Table 12** for the Sewer Utility.

For the purposes of this assessment, only the revenues and expenses associated with the water and sewer utilities are accounted for. Financial line items used as part of this assessment include the following:

- Utility User Fees (Revenue)
- Operating Expenses (Expense)
- Payroll and Benefits (Expense)

For calculation purposes, it is assumed that 100% of Utility User Fees are attributed to customer billing.

Table 9: Summary of water utility funding and financial assets from Audited Financial Statements from 2019 to 2023.

	2019	2020	2021	2022	2023
Water Tangible Capital Assets					
Cost	56,682,092	60,995,656	67,912,089	69,325,402	71,740,572
Amortization	18,967,796	20,002,382	21,094,880	22,314,811	23,569,041
Book Value	37,714,296	40,993,274	46,817,209	47,010,591	48,171,531

Table 10: Summary of water utility annual operating revenues and expenses from 2019 to 2023.

	2019	2020	2021	2022	2023
REVENUE					
Taxation	-	-	-	-	-
Other Property Levies	-	-	-	-	-
Utility User Fees	4,793,620	5,157,467	5,468,216	5,630,044	5,815,893
Other Revenue	550	1,000	-	-	-
Other Fees and Charges	16,037	232,466	44,958	87,255	78,934
Government Transfers for Operating	-	-	-	-	-
Investment Income	102,056	127,149	87,052	102,199	109,025
Government Transfers for Capital	-	-	-	-	-
Connection Fees	103,586	63,862	50,504	43,729	-
Gain on Disposal of Tangible Capital Assets	-	-	-	-	-
Other Capital Revenues	-	43,184	720	-	-
TOTAL REVENUES	5,171,453	5,015,849	5,625,128	5,651,450	5,863,227
EXPENSES					

	2019	2020	2021	2022	2023
Payroll and Benefits	773,624	796,686	851,114	798,960	861,458
Operating Expenses	1,369,309	1,425,134	1,583,862	1,755,259	1,948,178
Debt Service - Interest	206,858	189,391	176,970	170,854	176,563
Amortization Expense	997,418	1,092,498	1,219,931	1,254,230	1,334,024
Total Expenses	3,347,209	3,503,709	3,831,877	3,979,303	4,326,168
Annual Surplus/ (Deficit)	\$ 1,942,428	\$ 1,668,640	\$ 2,121,419	\$ 1,819,573	\$ 1,883,924

Table 11: Summary of sewer utility funding and financial assets from Audited Financial Statements from 2018 to 2022.

	2019	2020	2021	2022	2023
Sewer Tangible Capital Assets					
Cost	57,337,931	60,006,637	67,377,036	68,106,582	69,221,492
Amortization	21,827,366	22,909,009	24,061,126	25,386,379	26,737,429
Book Value	35,510,565	37,097,628	43,315,910	42,720,203	42,484,063

Table 12: Summary of sewer utility annual operating revenues and expenses from 2018 to 2022.

	2019	2020	2021	2022	2023
REVENUES					
Taxation	-	-	-	-	-
Other Property Levies	-	-	-	-	-
Utility User Fees	6,315,078	6,534,642	6,942,007	7,390,061	7,638,301
Other Revenue	-	-	-	-	-
Other Fees and Charges	-	108	9,850	11,254	22,268
Government Transfers for Operating	-	-	-	-	-
Investment Income	113,454	127,611	142,022	158,054	172,221
Government Transfers for Capital	-	-	-	-	-
Connection Fees	15,935	10,747	14,172	6,203	-
Gain on Disposal of Tangible Capital Assets	-	-	-	-	-
Other Capital Revenues	-	14,755	10,700	4,500	-
Total Revenues	6,131,590	6,444,467	6,687,863	7,118,751	7,570,072
EXPENSES					
Payroll and Benefits	672,561	638,875	821,324	780,180	1,041,998
Operating Expenses	2,058,014	2,391,146	2,585,538	3,123,912	3,494,824

	2019	2020	2021	2022	2023
Debt Service - Interest	149,729	157,614	159,320	163,149	169,796
Amortization Expense	999,100	1,152,117	1,325,253	1,351,050	1,428,558
Total Expenses	3,879,404	4,339,752	4,891,435	5,418,291	6,135,176
Annual Surplus/ (Deficit)	\$ 2,149,185	\$ 2,565,063	\$ 2,348,111	\$ 2,227,316	\$ 2,151,781

2.4 STEPPED RATE STRUCTURE

The District has requested that a stepped rate structure be assessed for the water & sewer utilities. A stepped rate structure assigns different unit rates for water & sewer services based on increasing consumption.

A stepped rate structure is a common practice in many locations across Canada. Some municipalities *decrease* unit charges at higher consumption while others elect to *increase* unit charges at higher consumption. There are several factors that can influence the decision to implement a stepped decrease or stepped increase including financial, political, infrastructure capacities, and developmental pressures, among others. These should be carefully considered when deciding on the step direction, as well as the increments of each step. An overview of the considerations for decreasing, maintaining constant, and increasing unit rates at higher usages, in general, is given in **Table 13**. A detailed review of these rate setting factors specific to the District is outside the scope of this Study.

Table 13: Considerations for decreasing, maintaining constant, and increasing water unit rates at higher usages.

DECREASING UNIT RATE	CONSTANT UNIT RATE	INCREASING WATER RATES
<ul style="list-style-type: none"> – Can incentivize large industrial and commercial users to enter the market and connect to the system. – Leads to increased net water usage and can place strain on the water system. – Increased unit operation & maintenance costs may not be sufficiently covered. – Can advance the timing of capital upgrades projects as infrastructure approaches capacity. – Large users with fluctuating seasonal demands (i.e., breweries) can greatly benefit for a majority of their high quarterly bill being at the reduced cost. 	<ul style="list-style-type: none"> – Easy to monitor and maintain. – Can be viewed as the most equitable of the three options, as all consumers pay the same amount regardless of usage. – Simplified rate-setting process. 	<ul style="list-style-type: none"> – Can incentivize customers to use less water. – Increased unit operation & maintenance costs (if any) can be sufficiently covered. – Additional revenues generated from high-demand users can be leveraged into other water utility projects such as capital upgrades and consumer awareness programs. – The lesser net water usage can lead to delayed capital upgrades projects. – Greater water preservation is viewed positively by the average consumer.

Examples of nearby communities with each of the three rate structures described above – decreasing, constant, increasing – include the City of Mission, the City of Abbotsford, and the City of Salmon Arm, respectively.

For the City of Mission, quarterly metered water user rates for commercial/industrial/institutional and multi-unit residential connections decrease with increasing water usage. For customers with usage more than 1,200 cubic meters per quarter, the unit cost per cubic meter of water is approximately half of the cost for the first 300 cubic meters (**Figure 1**).

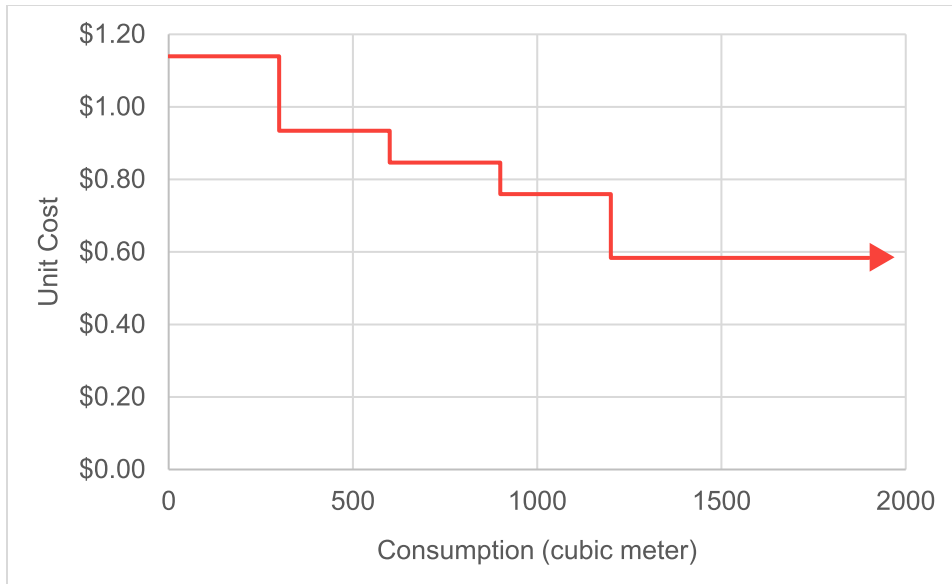


Figure 1: City of Mission unit rate per cubic meter of water per quarter for commercial/industrial/institutional and multi-unit residential connections in 2023.

The City of Abbotsford maintains a constant (one-step) rate structure for its water customers (Table 14). The City of Abbotsford offers a discounted rate of approximately 5% for bill payment by the due date.

Table 14: 2023 water utility rates for Abbotsford, BC.

CUSTOMER CLASSIFICATION	FULL RATE	DISCOUNTED RATE (PAYMENT BY DUE DATE)
Residential, Commercial, & Institutional	\$1.36/m ³	\$1.29/m ³
Industrial & Agricultural	\$1.23/m ³	\$1.17/m ³

The City of Salmon Arm offers customers with a 6-step increase in water utility rates with increasing usage.

Table 15: 2022 water utility rates for Salmon Arm, BC.

COST ITEM (FOR ALL CUSTOMER CLASSIFICATIONS)	UNIT COST
First 300 cubic meters	\$2.52
Next 300 cubic meters	\$2.84
Next 300 cubic meters	\$3.10
Next 300 cubic meters	\$3.35
Next 300 cubic meters	\$3.76
All over 1500 cubic meters	\$4.16

3 RATE STUDY

A stepped rate structure was developed using the information provided by the District and other publicly available information. The Study includes both a multi-step rate structure as well as a one-step rate structure for a baseline comparison between the two rate structures.

3.1 APPROACH

In following with the District's three main water management tools (water system renewals & upgrades, water conservation, and water metering), as well as the rate structures of nearby municipalities of similar size and scale, a six-step *increasing* rate structure was utilized. An increasing stepped rate structure was selected for the following reasons:

- Can incentivize customers to use less water, thus help meet the District's ideals toward reducing total usage.
- Can have financial benefits in other facets of the water & sewer utility systems, such as delaying capital upgrades to the treatment facilities and piped infrastructure.
- The model provides the District with the flexibility and ease to adjust the stepped increments based on financial and non-financial factors.

The model was developed projecting rates into the year 2028 and can be adjusted in due course to determine rates into latter years.

3.2 ASSUMPTIONS

The following base assumptions were made in the development of the utility rate structure model:

- The annual population growth rate is assumed as 4.0%.
- All operational expenses are assumed to increase linearly with population.
- The annual rate of new residences & ICI customers is assumed as 4.0% (corresponding to the annual growth rate). Connections for a given projected year will be rounded to the nearest whole number.
- The borrowing rate is assumed as 5.0%.
- A combined inflation rate of 6.0% has been assumed. This accounts for both market inflation and relative increased costs due to utility upgrades/expansion.
- A combined (metered and unmetered) per capita demand of 457 Lcd.
- Metered connections will have a 20% lesser demand than unmetered connections. For calculation purposes, the resultant reduction in demand for converted connections each year will be realized at the end of the conversion year.
- Proportional to the decrease in water & sewer demand, utility operating costs will decrease as meters are installed. A 5% annual reduction in unit production cost (accounted for in the *Operating Expenses* line of the revenue and expenses form) was assumed for converted customers.
- All new multi-residential buildings and ICI connections between the most recent census year (2021) have meters installed, and all such future connections will have meters installed.
- All new single-family dwellings will have meters or meter boxes installed. However, all single-family dwellings have been assumed to continue on flat rate billing for the forecast years.
- The sale of bulk/truck full water is not included.

3.3 MODEL CALIBRATION

Calibration of the financial model involved several steps to account for the complexity of the existing rate structure. The District currently uses a combination of metered and flat rate utility billing structures (covered in more detail in [Section 2.1.4](#)). In summary:

- All single-family residential units are on a flat rate billing structure with new structures having meter boxes for future adaptation;
- A portion of ICI connections (approximately 70) are unmetered and on flat rate billing, while the remaining connections are being converted to the metering program.

A summary of the metered and unmetered customers was provided by the District indicating the site name and the estimated number of sub-units. An example of the contents of these table is provided in [Table 16](#).

Table 16: Summary of connection name and estimated number of sub-connections.

SITE NAME	EST. CONNECTIONS
University Hill Apartments	40
Saint Joseph's Church of Squamish	1
Squamish Baptist Church	1
Highland Glen Estates	40
Mamquam Motors	1
Sea to Sky Finishes	1
Dake Contracting / Pacific Restorations	1
Harold's Auto Recycling	1
Squamish Heating & Sheet Metal (2545A Mamquam Rd)	1
Squamish Heating & Sheet Metal Building 2? (2547 Mamquam Rd)	1

Auditing the classification (i.e., Pool Rooms, Laundries, Campgrounds) of each connection by its site name is beyond the expectation of this Study. Considering this, the sites were grouped into the following categories:

- Apartment, Townhouse, Fourplex, Triplex, or Live-Work (Each Unit)
- Not for Profit Seniors Housing
- Tourist Accommodation, Hostels, Hotels, Motels
- Public Garages and Service Stations
- Café, Restaurant, Coffee Shop, Bakeries, Dining Room, Public Lounge, and Cocktail Bar
- Churches
- Schools
- Commercial / Other

Categorical assignment was based on reasonable site name descriptors (i.e., *Mamquam Motors* was placed in the *Public Garages and Service Stations* category) and estimated number of connections (i.e., services with 40 connections were generally placed in the *Apartment, Townhouse, Fourplex, Triplex, or Live-Work* category). Connections placed in the *Commercial / Other* category were assigned to the billing classifications based on an estimated relative percentage of the total connections. For example, it is reasonably estimated that there is a substantially greater number of *Stores* connections compared to *Mills, Breweries, Wineries, and Distilleries*.

Since 2021, a significant portion of these unmetered connections have been converted to meters. Based on the metered conversion information provided by the District, there are a total of 67 ICI unmetered connections remaining. A summary metered & unmetered water & sewer connections by classification is given in **Table 17**.

Table 17: 2023 summary of metered and unmetered water & sewer connections by classification.

NO.	SHORT NAME	ACCOUNT TYPE	METERED	UNMETERED	CONNECTION
1	Single Unit Dwelling	Water & Sewer		8084	8084
2	Apartment, Townhouse, Fourplex, Triplex, or Live-Work (Each Unit)	Water & Sewer	2644	400	3044
3	Secondary Suite, Accessory Dwelling Unit, Multi-Unit Flex Unit	Water & Sewer			
4	Not for Profit Seniors Housing	Water & Sewer	120		120
5	Hospitals	Sewer Only	1		1
6	Home Occupation	Water Only			
7	Home Occupation, Other	Water & Sewer			
8	Tourist Accommodation, Hostels, Hotels, Motels	Water & Sewer	172		172
9	Beauty Shops, Beauty Parlors, & Health Spas	Water & Sewer	34		34
10	Café, Restaurant, Coffee Shop, Bakeries, Dining Room, Public Lounge, and Cocktail Bar	Water & Sewer	31		31
11	Dentists	Water & Sewer	17		17
12	Greenhouses, Nurseries, Cannabis Production, Agriculture, and Animal Farms	Water & Sewer	34	1	35
13	Pool Rooms	Water & Sewer	17		17
14	Public Garages and Service Stations	Water & Sewer	21	5	26
15	Churches	Water & Sewer	17	2	19
16	Stores, Banks, Theatres, Public Halls, Clubs, Theatres, Medical Clinics, Other	Water & Sewer	120	28	148
-	Office Buildings	Sewer Only	17	3	20
-	Offices for Rent, Other	Sewer Only	7		7
17	Laundromats	Water & Sewer	10	1	11
18	Mills, Breweries, Wineries, Distilleries	Water & Sewer	10		10
19	Commercial Swimming Pools	Water Only	10		10
20	Campgrounds	Water & Sewer	10	1	11
21	Machine Shops	Water & Sewer	10		10
22	Nursing Homes	Water & Sewer	10		10
23	Schools	Water & Sewer	18	2	20
-	Warehouses	Sewer Only	17		17
TOTALS			3347	8527	11874

Given the small number of water-only customers and sewer-only customers relative to the total number of service connections, calculations in this Study have been simplified to assume that all customers are water & sewer customers.

As the remaining unmetered multi-family residential buildings and ICI connections are being converted to the meters, it is necessary to estimate the connection size of each connection classification. This is important in latter calculations, as the connection size (19mm, 25mm, 38mm, etc.) will be used to estimate the water demand from each connection. Within each classification, a percentage of connections by size was estimated (**Table 18**). The variety in the connection sizing is to reflect, for instance, that different apartment complexes are larger than others and require larger connections. Note that all single-unit dwellings have been manually assigned as <19mm to better match the anticipated demand of a typical single-family dwelling customer.

Table 18: Estimated percent connection size by connection classification.

NO.	SHORT NAME	<19MM	25MM	38MM	50MM	75MM	100MM	150MM
1	Single-Unit Dwelling	100%						
2	Apartment, Townhouse, Fourplex, Triplex, or Live-Work (Each Unit)		10%	20%	40%	20%	10%	
3	Secondary Suite, Accessory Dwelling Unit, Multi-Unit Flex Unit		100%					
4	Not for Profit Seniors Housing	10%	20%	40%	20%	10%		
5	Hospitals							
6	Home Occupation	20%	60%	20%				
7	Home Occupation, Other	20%	60%	20%				
8	Tourist Accommodation, Hostels, Hotels, Motels		25%	50%	25%			
9	Beauty Shops, Beauty Parlors, & Health Spas	100%						
10	Café, Restaurant, Coffee Shop, Bakeries, Dining Room, Public Lounge, and Cocktail Bar		20%	20%	20%	20%	20%	
11	Dentists	25%	50%	25%				
12	Greenhouses, Nurseries, Cannabis Production, Agriculture, and Animal Farms		25%	50%	25%			
13	Pool Rooms	25%	50%	25%				
14	Public Garages and Service Stations	25%	50%	25%				
15	Churches	25%	50%	25%				
16	Stores, Banks, Theatres, Public Halls, Clubs, Theatres, Medical Clinics, Other	25%	50%	25%				
0	Office Buildings		25%	50%	25%			
0	Offices for Rent, Other	100%						
17	Laundromats		25%	50%	25%			
18	Mills, Breweries, Wineries, Distilleries	25%	50%	25%				
19	Commercial Swimming Pools	100%						
20	Campgrounds	25%	50%	25%				
21	Machine Shops	25%	50%	25%				
22	Nursing Homes		20%	60%	20%			
23	Schools		25%	50%	25%			
0	Warehouses	25%	50%	25%				

The table above (for the ICI connections only) was calibrated against the quantitative metering data provided by the District in the Neptune 360 File Mapper export data. The Neptune data provided did not identify the end-user type at each of the connections (i.e., residential, office, hospital). Although it is impractical to assign meter size for each classification, calibrating the totalized metered connections by size is adequately representative of the estimated demands.

The model was further calibrated using two concurrent methods – one for metered connections and one for unmetered connections.

3.3.1.1 METERED CONNECTIONS

The calibration of the metered portion of the model was done using a classification capacity ratio, which assumes that the consumer demand is linearly proportional to the pipe connection size. The number of connections within each classification was adjusted based on a range of expected connection sizes (refer to **Table 18**). The classification capacity ratio was normalized to achieve an effective service population of 2.41 persons for a single-family dwelling (corresponding to the Census-indicated population divided by the number of private dwellings) and slightly lesser for all other residential classifications. The effective service population from the model was calibrated against the actual population and demonstrated a strong correlation (**Table 19**).

Table 19: Classification capacity ratios for meter sizes.

CLASSIFICATION	UNIT SERVICE POPULATION	RESIDENTIAL CUSTOMERS	EFFECTIVE SERVICE POPULATION
Single-Family Dwelling	2.51	8,084	20,291
Apartment, Townhouse, Fourplex, Triplex, Live-Work, Secondary Suite, Accessory Dwelling Unit, Multi-Unit Flex Unit	2.38	3,044	7,258
Not for Profit Seniors Housing	2.38	120	286
2024 Total Effective Service Population			27,835
2023 Service Population			28,061

3.3.1.2 UNMETERED CONNECTIONS

The calibration of the unmetered portion of the model was done using residential equivalent units (REUs). Each of the unmetered connections classifications was multiplied by a factor to best represent the relative consumption rate per dwelling unit. The base REU was normalized to the classification(s) with the smallest assumed demand, which were *Secondary Suite, Accessory Dwelling Unit, Multi-Unit Flex Units* and *Not for Profit Seniors Housing*. All other connection classifications were assigned an REU value relative to the base unit (which was derived directly from the relative rates from the Fees and Charges Bylaw). The REU factors and projected number of REUs from 2022 to 2029 for each classification are shown in **Table 20**. Note the following:

- Other than for single-family dwellings, which have been equipped with meter boxes but not meters, there is no change in the number of REUs from 2021 to 2023 as all new connections since 2021 have been metered.
- An REU unit is *not* the same as the service population, although these two units are generally proportional.
- For calculation purposes, it was assumed that all current unmetered ICI connections will remain unmetered.

Table 20: Classification REUs for unmetered connections.

REU	CUSTOMER DESCRIPTION	2022	2023	2024	2025	2026	2027	2028	2029
1.256	Single Unit Dwelling	7,761	8,084	8,407	8,731	9,054	9,377	9,701	10,024

REU	CUSTOMER DESCRIPTION	2022	2023	2024	2025	2026	2027	2028	2029
1.256	Apartment, Townhouse, Fourplex, Triplex, or Live-Work (Each Unit)	7,761	8,084	8,407	8,731	9,054	9,377	9,701	10,024
1.000	Secondary Suite, Accessory Dwelling Unit, Multi-Unit Flex Unit	400	400	400	400	400	400	400	400
1.000	Not for Profit Seniors Housing	0	0	0	0	0	0	0	0
31.122	Hospitals	0	0	0	0	0	0	0	0
3.103	Home Occupation	0	0	0	0	0	0	0	0
0.000	Home Occupation, Other	0	0	0	0	0	0	0	0
18.061	Tourist Accommodation, Hostels, Hotels, Motels	0	0	0	0	0	0	0	0
3.103	Beauty Shops, Beauty Parlors, & Health Spas	0	0	0	0	0	0	0	0
3.000	Café, Restaurant, Coffee Shop, Bakeries, Dining Room, Public Lounge, and Cocktail Bar	0	0	0	0	0	0	0	0
2.653	Dentists	0	0	0	0	0	0	0	0
2.122	Greenhouses, Nurseries, Cannabis Production, Agriculture, and Animal Farms	0	0	0	0	0	0	0	0
3.184	Pool Rooms	1	1	1	1	1	1	1	1
5.122	Public Garages and Service Stations	0	0	0	0	0	0	0	0
2.513	Churches	5	5	5	5	5	5	5	5
3.097	Stores, Banks, Theatres, Public Halls, Clubs, Theatres, Medical Clinics, Other	2	2	2	2	2	2	2	2
2.510	Office Buildings	28	28	28	28	28	28	28	28
1.389	Offices for Rent, Other	3	3	3	3	3	3	3	3
7.480	Laundromats	0	0	0	0	0	0	0	0
7.490	Mills, Breweries, Wineries, Distilleries	1	1	1	1	1	1	1	1
2.033	Commercial Swimming Pools	0	0	0	0	0	0	0	0
14.962	Campgrounds	0	0	0	0	0	0	0	0
3.667	Machine Shops	1	1	1	1	1	1	1	1
6.564	Nursing Homes	0	0	0	0	0	0	0	0
12.551	Schools	0	0	0	0	0	0	0	0
1.689	Warehouses	2	2	2	2	2	2	2	2
Totals		8,204	8,527	8,850	9,174	9,497	9,820	10,144	10,467

Due to the lack of information on the water & sewer usage between the different classifications, the model was back-calibrated through a status quo simulation (unadjusted for capital expenditures, reserve allocation, and minor capital upgrades) and compared to the 2024 water and sewer utility fees. The resulting output from the model was a total annual cost per REU of \$498.29 for water, which is strongly correlated to the \$500 customer cost per annum in the Water Rates Bylaw, and \$635.65, which is strongly correlated to the \$635 customer cost per annum in the Sewer Rates Bylaw.

3.4 CUSTOMER CONNECTION PROJECTIONS

Using the assumed 4.0% annual increase in customer connections, the number of connections per classification is given in **Table 21**. Note that three classifications have zero assigned connections. For calculation purposes, the *Secondary Suite, Accessory Dwelling Unit, Multi-Unit Flex Unit* item was grouped into the *Apartment, Townhouse, Fourplex, Triplex, or Live-Work* classification. The *Home Occupation* classifications were omitted due to limitations on data gathering.

Table 21: Total number of connections by classification from 2022 to 2029.

NO.	CLASSIFICATION	2022	2023	2024	2025	2026	2027	2028	2029
1	Single Unit Dwelling	7,761	8,084	8,407	8,731	9,054	9,377	9,701	10,025
2	Apartment, Townhouse, Fourplex, Triplex, or Live-Work (Each Unit)	2,922	3,044	3,166	3,292	3,424	3,561	3,703	3,852
3	Secondary Suite, Accessory Dwelling Unit, Multi-Unit Flex Unit	0	0	0	0	0	0	0	0
4	Not for Profit Seniors Housing	115	120	125	130	135	140	146	152
5	Hospitals	1	1	1	1	1	1	1	1
6	Home Occupation	0	0	0	0	0	0	0	0
7	Home Occupation, Other	0	0	0	0	0	0	0	0
8	Tourist Accommodation, Hostels, Hotels, Motels	165	172	179	186	193	201	209	218
9	Beauty Shops, Beauty Parlors, & Health Spas	33	34	35	37	38	40	41	43
10	Café, Restaurant, Coffee Shop, Bakeries, Dining Room, Public Lounge, and Cocktail Bar	30	31	32	34	35	36	38	39
11	Dentists	16	17	18	18	19	20	21	22
12	Greenhouses, Nurseries, Cannabis Production, Agriculture, and Animal Farms	34	35	36	38	39	41	43	44
13	Pool Rooms	16	17	18	18	19	20	21	22
14	Public Garages and Service Stations	25	26	27	28	29	30	32	33
15	Churches	18	19	20	21	21	22	23	24
16	Stores, Banks, Theatres, Public Halls, Clubs, Theatres, Medical Clinics, Other	142	148	154	160	166	173	180	187
0	Office Buildings	19	20	21	22	22	23	24	25
0	Offices for Rent, Other	7	7	7	8	8	8	9	9

NO.	CLASSIFICATION	2022	2023	2024	2025	2026	2027	2028	2029
17	Laundromats	11	11	11	12	12	13	13	14
18	Mills, Breweries, Wineries, Distilleries	10	10	10	11	11	12	12	13
19	Commercial Swimming Pools	10	10	10	11	11	12	12	13
20	Campgrounds	11	11	11	12	12	13	13	14
21	Machine Shops	10	10	10	11	11	12	12	13
22	Nursing Homes	10	10	10	11	11	12	12	13
23	Schools	19	20	21	22	22	23	24	25
0	Warehouses	16	17	18	18	19	20	21	22
TOTALS		11,399	11,874	12,349	12,830	13,317	13,811	14,312	14,821

A similar calculation was performed based on total connection size (**Table 22**). The District indicated that a majority of new developments are multi-family dwellings. For simplification purposes, the projected new connections have been assumed as 19mm to simplify the calculation and better project typical residential dwelling demands.

Table 22: Projected total customer connections per connection size.

METER SIZE	2024	2025	2026	2027	2028	2029
19mm	8,530	8,864	9,190	9,517	9,846	10,170
25mm	537	557	582	603	625	642
38mm	851	888	925	959	998	1,032
50mm	1,342	1,397	1,452	1,508	1,569	1,634
75mm	639	665	692	719	749	778
100mm	323	336	349	363	378	393
150mm						

Throughout the lifecycle of the proposed rate structure, the relative number of metered and unmetered connections will change. This is a result of both organic growth & development. All new connections are assumed to be installed with a meter. A summary of the estimated number of metered connections from 2024 to 2029 is given in **Table 23**, and for unmetered connections is given in **Table 24**. The formula for calculating the increase in metered connections from year-to-year is summarized as follows:

$$\text{Metered Connections} = (\text{Previous Total Connections} \times \text{Growth Rate}) + \text{Metered Conversions}$$

Table 23: Projected metered customer connections per connection size.

METER SIZE	2024	2025	2026	2027	2028	2029
19mm	114	124	127	131	136	137
25mm	476	496	521	542	564	581
38mm	757	794	831	865	904	938
50mm	1,180	1,235	1,290	1,346	1,407	1,472
75mm	559	585	612	639	669	698

METER SIZE	2024	2025	2026	2027	2028	2029
100mm	283	296	309	323	338	353
150mm						

Table 24: Projected unmetered customer connections per connection size.

METER SIZE	2023	2024	2025	2026	2027	2028
19mm	8,416	8,740	9063	9,386	9,710	10,033
25mm	61	61	61	61	61	61
38mm	94	94	94	94	94	94
50mm	162	162	162	162	162	162
75mm	80	80	80	80	80	80
100mm	40	40	40	40	40	40
150mm						

A side-by-side comparison of the number of metered and unmetered connections from 2022 to 2029 is given in **Table 25**.

Table 25: Metered and unmetered connections from 2022 to 2029.

CUSTOMER TYPE	2022	2023	2024	2025	2026	2027	2028	2029
Metered	3,245	3,399	3,369	3,530	3,690	3,846	4,018	4,179
Unmetered	8,207	8,530	8,853	9,177	9,500	9,823	10,147	10,470
TOTAL	11,452	11,929	12,222	12,707	13,190	13,669	14,165	14,649

3.5 POPULATION AND WATER DEMAND PROJECTIONS

A summary of the population and water usage projections are provided in **Table 26**. Note that as unmetered connections are converted to metered connections, the combined demand decreases and approaches metered per capita demand.

Table 26: Population and water usage projections from 2022 to 2029.

PARAMETER	2021	2022	2023	2024	2025	2026	2027	2028	2029
Population	23,819	28,061	29,206	30,398	31,638	32,930	34,274	35,672	37,128
Private Dwellings	9,906	11,670	12,146	12,642	13,158	13,695	14,254	14,836	15,441
ADD (MLD)	10.89	12.82	13.35	13.89	14.46	15.05	15.66	16.30	16.97
Percent Unmetered	74.1%	73.3%	72.5%	72.4%	72.2%	72.0%	71.9%	71.6%	71.5%
Percent Metered	25.9%	26.7%	27.5%	27.6%	27.8%	28.0%	28.1%	28.4%	28.5%
Unmetered Per Capita Demand	481	483	483	483	483	483	483	483	483

PARAMETER	2021	2022	2023	2024	2025	2026	2027	2028	2029
Metered Per Capita Demand (80% of Unmetered Demand)	388	388	388	388	388	388	388	388	388
Combined Demand	457	458	457	457	457	457	456	456	456

The projected annual water sales and estimated volume of water to the sewers are given in **Table 27**. Although not a part of the scope of this Study, the estimated volume of water produced (accounting for 5% for municipal uses and 10% for unaccounted for water) is included to assist the District the volumetric/capacity impacts.

Table 27: Projected annual water sales from 2022 to 2029.

PARAMETER	2022	2023	2024	2025	2026	2027	2028	2029
Annual Metered Water Sales (m ³)	1,059,712	1,136,291	1,186,662	1,244,721	1,304,649	1,365,703	1,433,009	1,500,002
Annual Unmetered Water Sales (m ³)	3,628,825	3,735,416	3,882,882	4,029,355	4,182,427	4,343,389	4,506,239	4,679,545
Annual Combined Water Sales (m³)	4,688,537	4,871,707	5,069,544	5,274,075	5,487,076	5,709,092	5,939,248	6,179,546
Water for Municipal Uses (5% of Total Sales, m ³)	234,427	243,585	253,477	263,704	274,354	285,455	296,962	308,977
Unaccounted for Water (10% of Total Sales, m ³)	468,854	487,171	506,954	527,408	548,708	570,909	593,925	617,955
Total Water Produced (m³)	5,391,817	5,602,463	5,829,976	6,065,187	6,310,137	6,565,456	6,830,135	7,106,478
Sewer Volume Metered (m ³)	1,059,712	1,136,291	1,186,662	1,244,721	1,304,649	1,365,703	1,433,009	1,500,002
Sewer Volume Unmetered (m ³)	3,628,825	3,735,416	3,882,882	4,029,355	4,182,427	4,343,389	4,506,239	4,679,545
Total Volume to Sewers (m³)	4,688,537	4,871,707	5,069,544	5,274,075	5,487,076	5,709,092	5,939,248	6,179,546

3.6 REVENUE AND EXPENSES PROJECTIONS

The assumptions in calculating the projected revenues and expenses are as follows:

- Inflation Rate = 6%
- Sewer Remediation Contribution = 5% of previous year's expenses
- Administration = 10% of given year's water & sewer expenses
- Working Capital Surcharge = 1% of given year's water & sewer expenses

Reserve contributions, minor capital upgrades, and contingency were not explicitly called out as expense line items for which revenue must be generated for. Instead, the calculation methodology sought to maintain the District's average annual book revenue – approximately \$3.2 M for water and \$2.2 M for sewer. It is important to note that book revenue is not the same as total revenue. Book revenues are applied to other facets of municipal operation and debt servicing. The District does not seek to generate water & sewer revenue beyond its collective needs.

The revenues and expenses were separated into three categories: administration, water utility, and sewer utility. The administration revenues and expenses are shared proportionally between the water & sewer utilities and are based on

the percentage given in the list above. For the purposes of this study, it was assumed that no revenues were generated by the administration services (service charges, surcharges, penalties, etc.). A summary of the anticipated administrative expenses is given in **Table 29**. Historical & projected revenues are calculated as *Water Revenues* minus *Water Expenses* (similar for sewer). Per the request of the District, Developer Cost Charges and Developer Contributed Assets have been omitted from the table below. Although these are listed as revenue line items in the District's Audited Financial Statement, they are generally dispersed outside of water & sewer. The omission of the developer revenues does not have any impact on the water & sewer rates as it cancels out via the calculation methodology. Note that the sum of capital contributions were averaged over the course of 2025 through 2029 in accordance with the District's 2025 Water Master Plan (for water capital) and 2024-2028 Financial Plan (for sewer capital). The 2029 sewer capital was assumed to be the same as the yearly average from 2024 to 2028. Using the average of the capital contributions over this period mitigates high annual fluctuations and provides a uniform rate increase.

Table 28: Combined anticipated administrative expenses for the water & sewer utilities from 2024 to 2029.

	2025	2026	2027	2028	2029
<i>Administration Expenses</i>					
Administration (Building, Office, Staff, etc.)	1,667,000	1,733,000	1,803,000	1,878,000	1,958,000
Working Capital Surcharge	167,000	173,000	180,000	188,000	196,000
Total Administrative Expenses	1,834,000	1,906,000	1,983,000	2,066,000	2,154,000
Total Administrative Revenue	0	0	0	0	0
Net Rate Requirement - Administration	1,834,000	1,906,000	1,983,000	2,066,000	2,154,000

The administration line item in the table above is separate from the payroll and benefits lines in the water and sewer expenses below. The water and sewer line items are for covering payroll and benefits for the employees directly working on the respective utilities.

A summary of the anticipated water utility revenues and expenses are given in **Table 29**. Most of the estimated annual revenues and expenses were based on either the inflation rate or trends in line items from 2018 to 2022, whichever was deemed more appropriate. For some line items with highly variable or unpredictable historical annual values, such as *Other Fees and Charges*, the average of the previous five years was projected plus inflation.

Table 29: Summary of relevant water utility revenues and expenses from 2025 to 2029.

	2025	2026	2027	2028	2029
EXPENSES					
Payroll and Benefits	968,000	1,026,000	1,088,000	1,153,000	1,222,000
Operating Expenses	2,189,000	2,320,000	2,459,000	2,607,000	2,763,000
Debt Service - Interest	156,000	147,000	138,000	130,000	122,000
Amortization Expense	1,499,000	1,589,000	1,684,000	1,785,000	1,892,000
Capital Contributions	2,703,811	2,703,811	2,703,811	2,703,811	2,703,811
Total Expenses - Water	7,515,811	7,785,811	8,072,811	8,378,811	8,702,811
REVENUE					
Water Rate Charges	(Calculated Below)				
Other Fees and Charges	103,000	109,000	116,000	123,000	130,000

	2025	2026	2027	2028	2029
Investment Income	119,000	126,000	134,000	142,000	151,000
Total Revenue (Before Rate Revenue) - Water	222,000	235,000	250,000	265,000	281,000
Water Rate Revenue Requirement	7,293,811	7,550,811	7,822,811	8,113,811	8,421,811
Total Projected Water Revenue*	7,737,811	8,020,811	8,322,811	8,643,811	8,983,811

* Revenue is applied to other reserves for future expenses and does not imply that the District is generating revenue beyond its needs.

The net water rate revenue requirement (the final row in the table above) represents the amount of revenue required from the *Water Rate Charges* line item to balance the sheet. Note that factors of safety have been built into the spreadsheet, including a 10% contingency, 15% contributions to reserves & minor capital upgrades (based on the previous year's Expenses Subtotal), and other conservative assumptions. For all assessed rate years, the District would need to generate revenue above the net rate requirement.

A similar summary of the anticipated sewer utility revenues and expenses are given in **Table 30**. The outputted sewer rate revenue requirement represents the amount of revenue required from the *Utility User Fees* line item to balance the sheet. District staff reviewed the 2024-28 Financial Plan as well as anticipated average sewer utility expenditures and requested that WSP include a capital allowance of \$4.5M/year.

Table 30: Summary of relevant sewer utility revenues and expenses from 2025 to 2029.

	2025	2026	2027	2028	2029
<i>Expenses</i>					
Payroll and Benefits	1,171,000	1,241,000	1,315,000	1,394,000	1,478,000
Operating Expenses	3,927,000	4,163,000	4,413,000	4,678,000	4,959,000
Debt Service - Interest	300,000	290,000	280,000	270,000	260,000
Amortization Expense	1,605,000	1,701,000	1,803,000	1,911,000	2,026,000
Capital Contributions	2,300,000	2,300,000	2,300,000	2,300,000	2,300,000
Total Sewer Expenses	9,303,000	9,695,000	10,111,000	10,553,000	11,023,000
<i>Revenue</i>					
Utility User Fees					
Other Fees and Charges	10,000	11,000	12,000	13,000	14,000
Investment Income	160,000	170,000	180,000	191,000	202,000
Total Revenue (Before Rate Revenue) - Sewer	170,000	181,000	192,000	204,000	216,000
Sewer Rate Revenue Requirement	9,133,000	9,514,000	9,919,000	10,349,000	10,807,000
Total Projected Sewer Revenue*	9,473,000	9,876,000	10,303,000	10,757,000	11,239,000

* Revenue is applied to other reserves for future expenses and does not imply that the District is generating revenue beyond its needs.

3.7 UTILITY RATE PROJECTIONS

3.7.1 METERED RATES

The metered rates were projected into 2029 utilizing both a one-step rate structure (for baseline comparison) and a six-step rate structure. The rates for metered connections (for both water & sewer utilities) generally followed the following formula:

$$\text{Metered Rate} = \text{Service Charge} + \text{Unit Charge}$$

where:

$$\text{Service Charge} = \text{Utility Administration Revenue Requirement}$$

$$\text{Unit Charge} = \text{Relative Rate Revenue Requirement} \div \text{Relative Metered Volumes}$$

In assessing the water & sewer utility rates for metered customers, the following assumptions were made:

- *Minimum Quarterly Usage Charge* is based on 27 m³ of water consumed.
- *Average Quarterly Usage* is based on 81 m³ of water consumed.
- Water consumed is directly proportional to volume of water discharged to the sewer.

3.7.1.1 ONE-STEP RATE CALCULATION

The one-step water utility commodity rates for both metered customers are given in **Table 31**. The water and sewer charges have been given as annually to match the billing cycles in the Bylaw, as well as quarterly for potential future consideration.

Table 31: One-step utility rates for metered customers from 2025 to 2029.

	2025	2026	2027	2028	2029
Water					
Unit Water Rate (per m ³)	\$1.33	\$1.35	\$1.37	\$1.39	\$1.42
Quarterly Service Charge	\$17.65	\$18.09	\$18.04	\$18.00	\$18.01
Minimum Quarterly Rate Charge	\$35.85	\$36.41	\$37.00	\$37.62	\$38.27
Average Quarterly Cost per Residential Connection	\$125.19	\$127.32	\$129.03	\$130.87	\$132.82
Average Annual Cost per Residential Connection	\$500.77	\$509.29	\$516.11	\$523.49	\$531.28
Sewer					
Unit Sewer Rate (per m ³)	\$1.66	\$1.70	\$1.74	\$1.78	\$1.82
Quarterly Service Charge	\$22.11	\$22.79	\$22.87	\$22.96	\$23.12
Minimum Quarterly Rate Charge	\$44.89	\$45.88	\$46.91	\$47.99	\$49.11
Average Quarterly Cost per Residential Connection	\$156.76	\$160.43	\$163.60	\$166.92	\$170.44
Average Annual Cost per Residential Connection	\$627.05	\$641.70	\$654.41	\$667.69	\$681.75

The projected average annual charges per connection size for the one-step rate structure for 2025 through 2029 are given in **Table 32** through **Table 36**, respectively. The information presented in these tables are for information only to give the District a general idea of the differential water and sewer rate charges for customers of varying meter sizes. Note that the annual consumption is scaled proportionally to the service pipe cross section. The minimum annual consumption can be adjusted as necessary to meet the ideals of the District. Also note that the Quarterly Service Charge is the sum of both water and sewer quarterly service charges.

Table 32: One-step annual charges per connection size for 2025.

METER SIZE	QUARTERLY SERVICE CHARGE	AVERAGE YEARLY CONSUMPTION	AVERAGE ANNUAL WATER RATE CHARGE	AVERAGE ANNUAL SEWER RATE CHARGE	AVERAGE ANNUAL CHARGES
19mm	\$39.76	324	\$430.15	\$538.62	\$1,127.82
25mm	\$39.76	660	\$876.24	\$1,097.19	\$2,132.48
38mm	\$39.76	1,680	\$2,230.43	\$2,792.85	\$5,182.33
50mm	\$39.76	4,092	\$5,432.69	\$6,802.59	\$12,394.32
75mm	\$39.76	7,368	\$9,782.03	\$12,248.64	\$22,189.72
100mm	\$39.76	14,724	\$19,548.13	\$24,477.34	\$44,184.52
150mm	\$39.76	27,828	\$36,945.49	\$46,261.57	\$83,366.11

Table 33: One-step annual charges per connection size for 2026.

METER SIZE	QUARTERLY SERVICE CHARGE	AVERAGE YEARLY CONSUMPTION	AVERAGE ANNUAL WATER RATE CHARGE	AVERAGE ANNUAL SEWER RATE CHARGE	AVERAGE ANNUAL CHARGES
19mm	\$40.88	324	\$436.94	\$550.55	\$1,150.99
25mm	\$40.88	660	\$904.36	\$1,146.69	\$2,214.55
38mm	\$40.88	1,680	\$2,302.00	\$2,918.84	\$5,384.34
50mm	\$40.88	4,092	\$5,607.01	\$7,109.46	\$12,879.97
75mm	\$40.88	7,368	\$10,095.91	\$12,801.19	\$23,060.61
100mm	\$40.88	14,724	\$20,175.37	\$25,581.54	\$45,920.42
150mm	\$40.88	27,828	\$38,130.96	\$48,348.48	\$86,642.95

Table 34: One-step annual charges per connection size for 2027.

METER SIZE	QUARTERLY SERVICE CHARGE	AVERAGE YEARLY CONSUMPTION	AVERAGE ANNUAL WATER RATE CHARGE	AVERAGE ANNUAL SEWER RATE CHARGE	AVERAGE ANNUAL CHARGES
19mm	\$40.91	324	\$443.96	\$562.92	\$1,170.52
25mm	\$40.91	660	\$919.68	\$1,146.69	\$2,230.01
38mm	\$40.91	1,680	\$2,341.01	\$2,918.84	\$5,423.49
50mm	\$40.91	4,092	\$5,702.03	\$7,109.46	\$12,975.12

METER SIZE	QUARTERLY SERVICE CHARGE	AVERAGE YEARLY CONSUMPTION	AVERAGE ANNUAL WATER RATE CHARGE	AVERAGE ANNUAL SEWER RATE CHARGE	AVERAGE ANNUAL CHARGES
75mm	\$40.91	7,368	\$10,266.99	\$12,801.19	\$23,231.82
100mm	\$40.91	14,724	\$20,517.26	\$25,581.54	\$46,262.44
150mm	\$40.91	27,828	\$38,777.13	\$48,348.48	\$87,289.24

Table 35: One-step annual charges per connection size for 2028.

METER SIZE	QUARTERLY SERVICE CHARGE	AVERAGE YEARLY CONSUMPTION	AVERAGE ANNUAL WATER RATE CHARGE	AVERAGE ANNUAL SEWER RATE CHARGE	AVERAGE ANNUAL CHARGES
19mm	\$40.96	324	\$451.48	\$575.85	\$1,191.18
25mm	\$40.96	660	\$919.68	\$1,173.04	\$2,256.56
38mm	\$40.96	1,680	\$2,341.01	\$2,985.91	\$5,490.76
50mm	\$40.96	4,092	\$5,702.03	\$7,272.82	\$13,138.69
75mm	\$40.96	7,368	\$10,266.99	\$13,095.34	\$23,526.18
100mm	\$40.96	14,724	\$20,517.26	\$26,169.35	\$46,850.46
150mm	\$40.96	27,828	\$38,777.13	\$49,459.43	\$88,400.40

Table 36: One-step annual charges per connection size for 2029.

METER SIZE	QUARTERLY SERVICE CHARGE	AVERAGE YEARLY CONSUMPTION	AVERAGE ANNUAL WATER RATE CHARGE	AVERAGE ANNUAL SEWER RATE CHARGE	AVERAGE ANNUAL CHARGES
19mm	\$41.13	324	\$451.48	\$575.85	\$1,191.85
25mm	\$41.13	660	\$919.68	\$1,173.04	\$2,257.24
38mm	\$41.13	1,680	\$2,341.01	\$2,985.91	\$5,491.43
50mm	\$41.13	4,092	\$5,702.03	\$7,272.82	\$13,139.36
75mm	\$41.13	7,368	\$10,266.99	\$13,095.34	\$23,526.85
100mm	\$41.13	14,724	\$20,517.26	\$26,169.35	\$46,851.13
150mm	\$41.13	27,828	\$38,777.13	\$49,459.43	\$88,401.07

3.7.1.2 SIX-STEP RATE CALCULATION

The proposed six-step rate structure was modeled after the City of Salmon Arm six-step water utility rate structure. The following are the base inputs of the model:

Water Utility

- Each of the six (6) step increments is 300 m³, except for the first step at 100 m³. The first, short increment is recommended to incentivize residential customers to consume less water.
- The increase between each step is 10%.

Sewer Utility

- Each of the two (2) step increments is 100 m³.
- The increase between each step is 10%.

The six-step utility commodity rates for both metered and non-metered consumers are given in **Table 37**. For ease of comparison, the one-step rates are also shown.

Table 37: Six-step utility rates for both metered and non-metered consumers from 2025 to 2029.

	2025	2026	2027	2028	2029
Water					
<i>1-Step Rate (for Reference)</i>	\$1.33	\$1.35	\$1.37	\$1.39	\$1.42
<i>First 100 m³</i>	\$1.24	\$1.29	\$1.33	\$1.37	\$1.41
<i>Next 300 m³</i>	\$1.36	\$1.42	\$1.46	\$1.51	\$1.55
<i>Next 300 m³</i>	\$1.50	\$1.56	\$1.61	\$1.66	\$1.71
<i>Next 300 m³</i>	\$1.65	\$1.72	\$1.77	\$1.83	\$1.88
<i>Next 300 m³</i>	\$1.81	\$1.89	\$1.95	\$2.01	\$2.07
<i>Over 1,300 m³</i>	\$1.99	\$2.08	\$2.14	\$2.21	\$2.27
Quarterly Service Charge	\$17.65	\$18.09	\$18.04	\$18.00	\$18.01
Minimum Quarterly Rate Charge	\$33.42	\$34.79	\$35.92	\$37.08	\$38.13
Average Quarterly Cost per Residential Connection	\$117.90	\$122.46	\$125.79	\$129.25	\$132.42
Average Annual Cost per Residential Connection	\$471.61	\$489.85	\$503.15	\$517.01	\$529.66
Sewer					
<i>1-Step Rate (for Reference)</i>	\$1.66	\$1.70	\$1.74	\$1.78	\$1.82
<i>First 100 m³</i>	\$1.63	\$1.67	\$1.72	\$1.77	\$1.81
<i>Over 100 m³</i>	\$1.79	\$1.84	\$1.89	\$1.94	\$2.00
Quarterly Service Charge	\$22.11	\$22.79	\$22.87	\$22.96	\$23.12
Minimum Quarterly Rate Charge	\$43.94	\$45.20	\$46.50	\$47.72	\$48.97
Average Quarterly Cost per Residential Connection	\$153.93	\$158.40	\$162.39	\$166.11	\$170.03
Average Annual Cost per Residential Connection	\$615.71	\$633.60	\$649.55	\$664.45	\$680.13

The annual charges per connection size for the one-step rate structure for 2025 through 2029 are given in **Table 38** through **Table 42**, respectively. Similar to the one-step rate structure – the information presented in the below tables are for information only to give the District a general idea of the differential water and sewer rate charges for customers of varying meter sizes.

Table 38: Six-step annual charges per connection size for 2025.

METER SIZE	QUARTERLY SERVICE CHARGE	AVERAGE YEARLY CONSUMPTION	AVERAGE ANNUAL WATER RATE CHARGE	AVERAGE ANNUAL SEWER RATE CHARGE	AVERAGE ANNUAL CHARGES
19mm	\$39.76	324	\$400.99	\$527.28	\$1,087.32
25mm	\$39.76	660	\$816.84	\$1,074.09	\$2,049.98
38mm	\$39.76	1,680	\$2,138.64	\$2,812.17	\$5,109.85
50mm	\$39.76	4,092	\$5,726.36	\$7,130.01	\$13,015.42
75mm	\$39.76	7,368	\$11,793.81	\$12,994.55	\$24,947.41
100mm	\$39.76	14,724	\$26,455.99	\$26,162.91	\$52,777.95
150mm	\$39.76	27,828	\$52,575.24	\$49,621.06	\$102,355.35

Table 39: Six-step annual charges per connection size for 2026.

METER SIZE	QUARTERLY SERVICE CHARGE	AVERAGE YEARLY CONSUMPTION	AVERAGE ANNUAL WATER RATE CHARGE	AVERAGE ANNUAL SEWER RATE CHARGE	AVERAGE ANNUAL CHARGES
19mm	\$40.88	324	\$417.50	\$542.45	\$1,123.45
25mm	\$40.88	660	\$850.47	\$1,104.98	\$2,118.96
38mm	\$40.88	1,680	\$2,226.68	\$2,893.04	\$5,283.23
50mm	\$40.88	4,092	\$5,962.10	\$7,335.07	\$13,460.67
75mm	\$40.88	7,368	\$12,279.32	\$13,368.27	\$25,811.10
100mm	\$40.88	14,724	\$27,545.09	\$26,915.35	\$54,623.94
150mm	\$40.88	27,828	\$54,739.57	\$51,048.15	\$105,951.23

Table 40: Six-step annual charges per connection size for 2027.

METER SIZE	QUARTERLY SERVICE CHARGE	AVERAGE YEARLY CONSUMPTION	AVERAGE ANNUAL WATER RATE CHARGE	AVERAGE ANNUAL SEWER RATE CHARGE	AVERAGE ANNUAL CHARGES
19mm	\$40.91	324	\$431.00	\$558.06	\$1,152.70
25mm	\$40.91	660	\$877.96	\$1,136.79	\$2,178.38
38mm	\$40.91	1,680	\$2,298.65	\$2,976.31	\$5,438.60
50mm	\$40.91	4,092	\$6,154.81	\$7,546.20	\$13,864.65
75mm	\$40.91	7,368	\$12,676.23	\$13,753.05	\$26,592.92
100mm	\$40.91	14,724	\$28,435.43	\$27,690.06	\$56,289.13
150mm	\$40.91	27,828	\$56,508.92	\$52,517.48	\$109,190.04

Table 41: Six-step annual charges per connection size for 2028.

METER SIZE	QUARTERLY SERVICE CHARGE	AVERAGE YEARLY CONSUMPTION	AVERAGE ANNUAL WATER RATE CHARGE	AVERAGE ANNUAL SEWER RATE CHARGE	AVERAGE ANNUAL CHARGES
19mm	\$40.96	324	\$445.00	\$572.61	\$1,181.46
25mm	\$40.96	660	\$906.48	\$1,166.44	\$2,236.76
38mm	\$40.96	1,680	\$2,373.33	\$3,053.94	\$5,591.12
50mm	\$40.96	4,092	\$6,354.78	\$7,743.01	\$14,261.64
75mm	\$40.96	7,368	\$13,088.08	\$14,111.75	\$27,363.67
100mm	\$40.96	14,724	\$29,359.31	\$28,412.24	\$57,935.40
150mm	\$40.96	27,828	\$58,344.92	\$53,887.19	\$112,395.95

Table 42: Six-step annual charges per connection size for 2029.

METER SIZE	QUARTERLY SERVICE CHARGE	AVERAGE YEARLY CONSUMPTION	AVERAGE ANNUAL WATER RATE CHARGE	AVERAGE ANNUAL SEWER RATE CHARGE	AVERAGE ANNUAL CHARGES
19mm	\$41.13	324	\$445.00	\$572.61	\$1,182.13
25mm	\$41.13	660	\$906.48	\$1,166.44	\$2,237.44
38mm	\$41.13	1,680	\$2,373.33	\$3,053.94	\$5,591.79
50mm	\$41.13	4,092	\$6,354.78	\$7,743.01	\$14,262.31
75mm	\$41.13	7,368	\$13,088.08	\$14,111.75	\$27,364.35
100mm	\$41.13	14,724	\$29,359.31	\$28,412.24	\$57,936.07
150mm	\$41.13	27,828	\$58,344.92	\$53,887.19	\$112,396.62

The six-step rate structure should not penalize multi-family complexes, as would be the case if, for instance, a large apartment complex would have a majority of their rate charges on a higher step. In such a case, water and sewer rates could be unfairly and substantially be higher than the previous water and sewer bylaws. In light of this, it is recommended that an exception be made for multi-family complexes to have an adjusted rate structure. A simplification of this: the second step for a 10-unit apartment complex would start at 1,000 m³ rather than 100 m³.

3.7.2 UNMETERED RATES

The rates for unmetered customers (for both water & sewer utilities) generally followed the following formula:

$$\text{Unmetered REU Rate} = \text{Service Charge} + \text{REU Commodity Rate}$$

where:

$$\text{Service Charge} = \text{Utility Administration Revenue Requirement}$$

$$\text{Unit Charge} = \text{Relative Rate Revenue Requirement} \div \text{Total REUs}$$

The unmetered REU rate was then multiplied by the REU ratios for each connection classification to estimate the rates per classification. Refer to **Section 3.3.1.2** for more information on the REU approach.

The REU commodity rates for unmetered customers are given in **Table 43**. The water and sewer charges have been given as annually to match the billing cycles in the Bylaw, as well as quarterly for potential future consideration.

Table 43: REU commodity rates for non-metered customers from 2025 to 2029.

	2025	2026	2027	2028	2029
Water					
Quarterly Service Charge	\$17.65	\$18.09	\$18.04	\$18.00	\$18.01
Quarterly Rate Charge per REU	\$114.83	\$116.99	\$119.42	\$122.02	\$124.94
Quarterly Cost per REU	\$132.49	\$135.08	\$137.46	\$140.02	\$142.95
Annual Cost per REU	\$529.95	\$540.32	\$549.84	\$560.08	\$571.82
Sewer					
Quarterly Service Charge	\$22.11	\$22.79	\$22.87	\$22.96	\$23.12
Quarterly Rate Charge per REU	\$143.79	\$147.41	\$151.42	\$155.63	\$160.33
Quarterly Cost per REU	\$165.89	\$170.20	\$174.29	\$178.59	\$183.44
Annual Cost per REU	\$663.57	\$680.80	\$697.17	\$714.37	\$733.77

The annual costs per REU for the water and sewer utilities were applied against the existing unmetered customer classification structure. The commodity rate increases were based on the percent increase in the water and sewer utility expenses from year to year. The annual percent increases in water and sewer rates are given in **Table 44**.

Table 44: Percent increases in water and sewer utility rates from 2025 to 2029.

	2025	2026	2027	2028	2029
Water	5.00%	5.00%	5.00%	5.00%	5.00%
Sewer	5.00%	5.00%	5.00%	5.00%	5.00%

The following should be noted regarding the interpretation of the above table:

- The 2024 percent rate increases were based on the District’s implemented rate increases.
- The relatively high rate increase in 2025 is a result of additional contingencies built into the calculation formula including reserve contributions, minor capital upgrades, future remediation, and general contingency. These contingencies can be adjusted to reflect the ideals of the District.

The resultant rate structure for the unmetered connection classifications is given in **Table 45**. Out of consideration for the differences between the water and sewer classifications:

- The numbering system has been ordered to the water utility and the corresponding sewer numbering system is shown for reference.
- Sub-classifications that apply to water customers only are shown in blue and sub-classifications that apply to sewer customers only are shown in brown. Common sub-classifications are shown in black.
- All numbers have been rounded to the nearest \$5 to match the District’s historical rate-setting practices.

It is understood that the District is looking to move away from this historical rate structure. However, its inclusion in this report is to provide a baseline for potential future use (i.e., those remaining unmetered customers whose meter installations are too difficult/infeasible).

Table 45: Proposed unmetered water & sewer rates by classification from 2024 to 2029.

WATER NO.	SEWER NO.	CLASSIFICATION	2025	
			WATER	SEWER
	1	For all types of uses minimum charge Per classification		\$660.00
1	2	Single Unit Dwelling within/outside the boundaries of the District of Squamish, each unit	\$525.00	\$660.00
2	3	Apartment, Townhouse, Fourplex, Triplex or Live-Work, each unit	\$525.00	\$660.00
3	4	Secondary Suite, Accessory Dwelling Unit, Multi-Unit Flex Unit, each unit	\$420.00	\$525.00
4	5	Not for profit seniors housing, each unit	\$420.00	\$525.00
5	6	Hospitals, each bed unit		\$330.00
6	22	Home Occupation		
		- Beauty Parlours, Barber Shops, Health Spa & Services	\$525.00	
		- for each chair over one	\$255.00	
7	23	Home Occupation businesses except for those specifically listed		
8	7	Tourist Accommodation, Hostel, Hotels, Motels, per Accommodation Unit		
		- With kitchen facilities	\$255.00	\$330.00
		- Without kitchen facilities	\$90.00	\$265.00
		- Without kitchen facilities - without bath		\$200.00
9	20	Barber Shops, Beauty Parlors & Health Spa and Services	\$525.00	\$1,120.00
		For each chair over one	\$255.00	
10	9	Café, Restaurant, Coffee Shop, Bakeries, Dining Room and Public Lounge and Cocktail Bar	\$675.00	\$1,120.00
		In addition, per seat	\$20.00	
11	19	Dentists	\$340.00	\$1,120.00
		In addition for each chair	\$180.00	\$1,680.00
12	25	Greenhouses, Nurseries, Cannabis Production , Agriculture and Animal Farms not in any other category	\$855.00	\$1,120.00
13	18	Pool Rooms with toilet and washroom facilities	\$685.00	

WATER NO.	SEWER NO.	CLASSIFICATION	2025	
			WATER	SEWER
		- In addition retail 1000-5000 sq. ft.	\$690.00	\$1,120.00
		- In addition retail over 5000 sq. ft.	\$1,030.00	\$1,650.00
		- In addition car wash for each bay/washing station	\$255.00	\$265.00
15	14	Church Halls and Church Residences (each)	\$525.00	\$660.00
		Church Halls (where separate from church)		\$660.00
16	10	Stores, Banks, Theatres, Offices, Office Buildings, Public Halls, Clubs, Medical Clinics, and all other commercial undertakings not specifically listed.		
		Less than 1000 sq. ft.	\$340.00	\$660.00
		1000 - 5000 sq. ft.	\$690.00	\$1,120.00
		Over 5000 sq. ft.	\$1,030.00	\$1,650.00
	11	Office Buildings for each office		\$130.00
	12	Offices for rent other than in an office building		\$130.00
		Less than 1000 sq. ft. 1000 - 5000 sq. ft.		\$690.00
		Over 5000 sq. ft.		\$1,030.00
17	15	Laundries, except where on an industrial rating	\$1,705.00	\$1,975.00
		Each additional washer		\$330.00
18	8	Mills, Breweries, Wineries, Distilleries and other small industrial users.	\$1,705.00	\$3,950.00
19		Commercial Swimming pool and/or Hot tub(s)	\$855.00	
20	24	Campgrounds		
		- centralized washroom, per un-serviced site		\$165.00
		- fully serviced, camp or recreational vehicle site	\$130.00	\$330.00
		- sani-stations and or dump stations	\$525.00	\$1,120.00
		- laundry facilities	\$1,705.00	\$330.00
		- public washroom, per fixture	\$175.00	

			2025	
WATER NO.	SEWER NO.	CLASSIFICATION	WATER	SEWER
	17	Warehouses		
		With 1 to 5 employees		\$660.00
		With more than 5 employees		\$1,120.00
24		Temporary water Service during construction (Building size in square meters of gross floor area)		
		Up to and including 500	\$235.00	
		Over 500 but not exceeding 2,000	\$460.00	
		Over 2,000 but not exceeding 9,000	\$1,175.00	
		Over 9,000 but not exceeding 24,000	\$1,755.00	
		Over 24,000 but not exceeding 45,000	\$2,325.00	
	26	Blockage minimum A fee to recover actual cost to the Municipality for the clearing a sewer blockage. The blockage minimum fee plus actual costs of labour and equipment. The municipality must demonstrate that the sewer blockage was due to consumer or property owner and the fee can be charged to the consumer or property owner.		\$215.00

4 DISCUSSION

In preparation of this Draft Report and corresponding utility rate review, many assumptions were made regarding the system, both existing and future. Some of the major assumptions incorporated into this iteration are as follows:

- A multi-step rate structure would be considered with a total of six (6) steps for the water utility and two (2) steps for the sewer utility with an initial increment of 100 m³ and subsequent increments of 300 m³. The rates would increase by 10% per step.
- The District would adopt the minimum volumes.

Some of the notable simplifications/deviations between the District's existing rate structure and our proposed rate structure are as follows:

- The unit charge (per m³) for water and sewer is the same across all users, regardless of classification.
- Base service charges for both water and sewer are applied to cover administrative costs (building, office staff, working capital surcharge, etc.). This is done to delineate fixed costs and usage-based costs.
- The monthly meter rental costs have been removed to balance out the increase in unit rate charges at higher steps for higher demand users.

It is important to note that the back-end financial model was constructed with a high degree of flexibility and adaptability. Any specified changes to the assumptions, either major or minor, may be quickly and fluently realized in a subsequent update to this Study.

4.1 IMPLEMENTATION CHALLENGES & STRATEGIES

WSP is cognisant that this is substantial change to the existing rate structures, both from District administration and customer (i.e., meter owner) perspectives.

EXISTING BILLING SOFTWARE

For administration, the new rate structure will require bylaw amendments and updates to the existing utility billing system. It is recommended that the District review the capabilities of the existing billing system to assess its capabilities. Namely – is the system only capable of a simplified, one-step rate structure or can it be adapted to utilize a multi-step rate structure?

Further, such administrative efforts are likely going to require an indeterminate of time to develop and implement and will require many different District officials to collaborate. It is recommended that the District assess the amount of time required until final implementation. It is unlikely that the back-end administrative work will be completed by the end of 2024 which would otherwise take effect in 2025. However, this may give ample time to develop and, more importantly, test the system in 2025 and to be implemented in 2026.

SHADOW BILLING

Shadow billing can be an effective method for both the District and its consumers to assess the viability of the new billing structure before it is formally implemented. From the District's point of view, shadow billing can be used to assess year-over-year revenues, particularly against historical revenues. As this new rate structure would be a substantial change from the previous rate structure, the shadow billing period would add a layer of visibility to the performance of the new system and answer such questions regarding the District ability to generate sufficient revenue and the consumer equity of the system.

The District may also consider putting the anticipated charges on the customer's water & sewer utility bills to demonstrate to the customer the benefits of the new rate structure, especially if the relative rates are lower under the new structure. This may also be a suitable platform for consumer awareness programming, informing the customer of the importance of conserving water or any corresponding consumer water conservation incentives programs.

MULTI-PURPOSE BUILDINGS

Some meter owners – who may previously not have been billed for water and sewer (as their sub-units were the account holders) – may be assigned water and sewer accounts for which they are responsible. Some items that can be considered in the transition are as follows:

- Provide sufficient information to customers ahead of the change, outlining the importance and benefits to the community.
- Allow a reasonable amount of time for meter owners to switch over to the new system. This could be a prolonged voluntary period followed by a date for which all unswitched accounts will be automatically converted.
- Prepare and publish guidelines or a suggested rate structure for building owners to assign rates to their occupants. A recommended rate structure could follow the superseded bylaws (**Table 45**). For instance, a dentist’s office previously paying to the District \$1,000 per year water would instead pay the building owner that \$1,000 who, in turn, would put that toward their metered usage.
- Inform the building owner of, or consider providing support for, installing sub-meters for each of their sub-units. This may be infeasible in some cases, however, if implemented properly can better the accountability of water and reduce consumption at the end-user level.

Aligning the utility billing structure through the meter owners can be advantageous toward reducing water consumption. For instance, a large apartment complex owner may consider installing low-flow water fixtures in each of their suites or run the sprinkler system for fewer hours of the day.

STRATA BUILDINGS

One of the major challenges is strata buildings, or buildings with no singular owner. For the purposes of this discussion, it is assumed that all ICI stratas are equipped with one water meter. In such a case, it is not possible to align the meter with the building owner and there is little-or-no incentive for each sub-owner to limit or reduce water consumption. It may be difficult and/or inequitable for the District to assign proportional rates for each of the sub-owners. There are several strategies that can be considered to manage this:

- Install, or work with the strata to install sub-meters for each of the different sub-owners. The installation of additional meters can be costly and it should be considered who is/are responsible for bearing this cost.
- Track the combined metered water usage but bill the sub-owners in accordance with the historical rate structure. This will have no additional cost requirement, but make ineffective the installed meter to incentivize reduced water consumption.
- Manage each strata on a case-by-case basis to determine the most effective method for splitting charges and incentivizing lesser water consumption. This may require substantial administrative effort to adopt and maintain.

4.2 UNIVERSAL METERING

4.2.1 SOCIAL BENEFITS

The District has previously considered implementing a universal water metering program, as it targets the District’s ideals of customer equity, water conservation, and water system management. Under the current system, approximately 90% of Squamish’s water service connections are unmetered single-family residential units. Despite the District’s best efforts to provide a multi-faceted classification structure for unmetered users, a universal metering program will provide a higher perceived fairness to users, such that their billing is directly correlated with funding the utility’s administrative and O&M costs. A volumetric-based unit rate for all users would provide customers with the ability/choice to reduce bills by changing their usage habits.

4.2.2 SUSTAINABILITY

As Squamish continues to grow at a high rate, there is increased awareness and need for sustainable development. This includes maximizing the efficient use of existing water supply sources before the development of additional sources. Metering and frequent billing will not only support reductions in average water usage but will effectively help to identify large leaks occurring on private properties. A successful metering and conservation program can effectively take the place of a portion of new supply needed for future development, thus reducing the overall impact on water sources. Future grant applications may be supported by, or dependent on, the District demonstrating that environmentally sustainable systems are in place for the wellbeing and longevity of the community. Similarly, the Province of British Columbia's updated Water Sustainability Act requires that license holders demonstrate a responsible usage of existing water supply prior to applying for new a new source. A water-metering program, and expanded conservation program, would certainly demonstrate responsible use of the existing water supplies.

4.2.3 RESILIENCY

Water conservation, predominantly during the summer months, will help to reduce peaking factors, and will permit an increased drought resiliency for the community.

4.2.4 FINANCIAL FACTORS

The 2015 District Water Master Plan estimated that more than 4,100 meters needed to be installed at a cost of \$9.5 million, and that the return on this investment may not deliver the necessary savings to the District through deferred capital costs. However, these costs are expected to be much higher, and a follow-up assessment is recommended to determine the cost and feasibility of such a program.

While the direct cost of implementing and maintaining a universal water-metering program will be substantial, there are several indirect financial benefits that could be achieved. Water conservation would result in a reduction in capital costs, reduced annual operating costs, and potentially a decrease in infrastructure requirements of developers. Decreased water usage will not remove the need for future source expansion but will defer the expansion time of future source development along with the overall capital costs over the lifespan of the system.

4.2.5 COST OF DEVELOPMENT

Although new development is often expected to pay for any system upgrades or expansions to accommodate the new growth, there are inevitably costs to the District. Reduction in demands on the water and sewer systems will allow for additional growth to occur while limiting the amount of expansion or upgrades to existing infrastructure. This will benefit the District and developers by reducing capital costs associated with servicing new sites.

5 SUMMARY & RECOMMENDATIONS

5.1 SUMMARY

WSP assessed the short-term financial needs of water & sewer utilities, as well as some of the non-financial factors such as total water usage and customer equity. WSP proposed a multi-step water & sewer utility rate structure until the year 2028 including such factors anticipated capital costs and ongoing revenues and expenditures. The model was calibrated against existing population and demand metrics and projected future rates using five years of audited financial statements and other information provided by the District.

The financial model calculated water & sewer rates for both metered and unmetered customers and integrated the findings into the District's existing customer classification system. Proposed changes were made to the existing rate structure to meet the customer equity, water conservation, and water system management ideals of the District.

5.2 RECOMMENDATIONS

WSP proposes the following additional recommendations:

- 1 Further consultation to assess the needs of both the District and its customers to better assist with the transition to the proposed metered system. In accordance with the discussion in **Section 4**:
 - a Review the existing billing software to assess its adaptability to the proposed new rate structure as well as the timeline for implementation.
 - b Consider implementing shadow billing to assess the performance of the new rate structure in the interim, particularly to determine whether the new rates generate sufficient revenue and are equitable for consumers. Consider adding shadow billing to current customer water and sewer utility bills and other incentivizing information.
 - c Consult with multi-purpose building owners to determine and effectively address challenges associated with the new billing structure. Previously, some meter owners did not pay for water, would then be required to do so, and will need support to adjust their sub-unit charges (i.e., rent).
 - d Consider implementations strategies for strata, noting that there is no one singular meter owner. While the most effective approach to conserving water is to install sub-meters for each sub-owner, it is an expensive approach. Alternatively, stratas can be managed on a case-by-case basis, or the historical rate structure can remain in place.
- 2 Consolidation of the water & sewer bylaws. If possible, remove the previous rate structure while noting that it may still be required in some cases (i.e., unmetered ICI customers where meter installation is infeasible).
- 3 The District further consider implementing a universal water metering program for all customers, including those in both ICI and single-family residential units. Although the direct costs to the District may be substantial, there are several indirect financial and other benefits that should be considered. Sub-components of this could include:
 - a Performing a cost/benefit analysis of a residential metering program while the District gains experience with the new water & sewer rate structure. Opportunistically seek grants to fund the program, if pursued.
 - b Support requiring new single family units to install meters.
 - c Offer voluntary program where single family owners can install meters at their cost of installation.



Appendix **A**

Audited Financial Statements

AUDITED FINANCIAL STATEMENTS

District of Squamish
Consolidated Financial Statements
For the year ended December 31, 2018



**District of Squamish
Consolidated Financial Statements
For the year ended December 31, 2018**

Contents

Management's Responsibility for Financial Reporting	2
Independent Auditor's Report	3 - 4
Consolidated Financial Statements	
Consolidated Statement of Financial Position	5
Consolidated Statement of Operations	6
Consolidated Statement of Change in Net Financial Assets	7
Consolidated Statement of Cash Flows	8
Notes to the Consolidated Financial Statements	9 - 27
Schedule 1 - Tangible Capital Assets	28
Schedule 2 - Tangible Capital Assets (prior year)	29
Schedule 3 - Segmented Revenues and Expenses by Type	30
Schedule 4 - Continuity of Reserves	31

**District of Squamish
December 31, 2018**

Management's Responsibility for Financial Reporting

The Council of the District of Squamish (the "District") has delegated the responsibility for the integrity and objectivity of the financial information contained in the consolidated financial statements to the management of the District. The consolidated financial statements which, in part, are based on informed judgments and estimates, have been prepared by management in accordance with Canadian public sector accounting standards, which have been applied on a basis consistent with that of the preceding year.

To assist in carrying out their responsibility, management maintains an accounting system and internal controls to provide reasonable assurance that transactions are executed and recorded in accordance with authorization, and that financial records are reliable for preparation of financial statements.

The Mayor and Council oversee management's responsibilities for the financial reporting and internal control systems. Council annually reviews and approves the consolidated financial statements.

The District's independent auditors, BDO Canada LLP, are engaged to express an opinion as to whether these consolidated financial statements present fairly the District's consolidated financial position, financial activities and cash flows in accordance with Canadian public sector accounting standards. Their opinion is based on procedures they consider sufficient to support such an opinion in accordance with Canadian generally accepted auditing standards.

The consolidated financial statements have, in management's opinion, been properly prepared within reasonable limits of materiality and in accordance with Canadian public sector accounting standards.



Christine Mathews
Director of Financial Services
May 7, 2019

Independent Auditor's Report

To the Mayor and Councilors of the District of Squamish

Opinion

We have audited the consolidated financial statements of the District of Squamish and its subsidiaries (the "Consolidated Entity"), which comprise the Consolidated Statement of Financial Position as at December 31, 2018 and the Consolidated Statements of Operations, Change in Net Financial Assets and Cash Flows for the year then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the consolidated financial position of the Consolidated Entity as at December 31, 2018 and its consolidated results of operations, change in net debt, and cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of this report. We are independent of the Consolidated Entity in accordance with the ethical requirements that are relevant to our audit of the consolidated financial statements in Canada and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Consolidated Entity's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Consolidated Entity or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Consolidated Entity's financial reporting process.

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally-accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

Independent Auditor's Report

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements (continued)

As part of an audit in accordance with Canadian generally-accepted auditing standards we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances. But not for the purpose of expressing an opinion on the effectiveness of the Consolidated Entity's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Consolidated Entity's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However future events or conditions may cause the Consolidated Entity to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Consolidated Entity to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Chartered Professional Accountants

Squamish, British Columbia


May 7, 2019

**District of Squamish
Consolidated Statement of Financial Position**

December 31, 2018	2018	2017
Financial Assets		
Cash and cash equivalents (Note 3)	\$ 87,602,342	\$ 34,799,111
Investments (Note 4)	247,066	43,795,317
Accounts receivable (Note 5)	4,792,630	5,696,544
Debenture deposits (Note 6)	503,886	480,537
	93,145,924	84,771,509
Liabilities		
Accounts payable, accrued and other liabilities (Note 7)	16,802,247	10,764,328
Deferred revenue (Note 8)	23,525,878	21,840,078
Debt (Note 9)	24,114,987	25,337,012
Provision for solid waste landfill (Note 10)	3,087,345	3,009,940
Provision for post-employment benefits (Note 11)	1,148,300	1,018,300
	68,678,757	61,969,658
Net Financial Assets	24,467,167	22,801,851
Non-Financial Assets		
Tangible capital assets (Schedules 1 and 2)	253,534,660	239,462,758
Inventories	155,047	196,078
Prepaid expenses	274,765	196,612
	253,964,472	239,855,448
Accumulated Surplus (Note 12)	\$ 278,431,639	\$ 262,657,299
Contractual Obligations and contingencies (Note 13)		



 Christine Mathews, CPA, CGA
 Director of Financial Services



 Karen Elliott
 Mayor of Squamish

**District of Squamish
Consolidated Statement of Operations**

For the year ended December 31, 2018	Financial Plan		
	2018	2018	2017
	(Note 14)		
Revenue (Schedule 3)			
Taxation (Note 15)	\$ 28,362,501	\$ 28,256,320	\$ 26,827,400
Other property levies (Note 15)	1,518,731	1,615,219	1,540,464
Utility user fees (Note 15)	13,881,237	14,110,169	13,561,559
Other revenue from own sources	4,281,890	5,280,839	5,484,510
Government transfers for operating (Note 16)	1,494,461	1,958,071	1,849,453
Investment income	1,041,625	1,717,836	1,264,838
	<u>50,580,445</u>	<u>52,938,454</u>	<u>50,528,224</u>
Expenses (Schedule 3)			
General Government	11,558,885	11,181,055	11,080,050
Protective Services	9,347,080	8,498,227	8,380,229
Transportation & Transit	5,183,364	5,106,246	4,528,449
Economic & Community Development	2,782,012	2,842,273	2,324,194
Parks, Recreation, Library & Culture	6,065,443	6,147,711	5,877,000
Health, Social & Housing	175,319	345,647	84,226
Solid Waste Management	3,447,549	3,881,191	3,734,557
Water Services	3,444,619	3,229,025	3,084,835
Waste Water Services	4,141,007	3,982,405	3,982,789
	<u>46,145,278</u>	<u>45,213,780</u>	<u>43,076,329</u>
Annual surplus before other	<u>4,435,167</u>	<u>7,724,674</u>	<u>7,451,895</u>
Other			
Government transfers for capital (Note 16)	5,944,767	970,108	2,538,237
Developer contributions	757,409	4,460,683	6,794,719
Development cost charges	8,795,802	2,470,524	412,524
Connection fees	124,964	75,581	143,294
Gain on disposal of tangible capital assets	-	72,770	17,681
	<u>15,622,942</u>	<u>8,049,666</u>	<u>9,906,455</u>
Annual Surplus	20,058,109	15,774,340	17,358,350
Accumulated Surplus, beginning of year	<u>262,657,299</u>	<u>262,657,299</u>	<u>245,298,949</u>
Accumulated Surplus, end of year	<u>\$282,715,408</u>	<u>\$278,431,639</u>	<u>\$262,657,299</u>

District of Squamish
Consolidated Statement of Change in Net Financial Assets

For the year ended December 31, 2018	Financial Plan		
	2018	2018	2017
	(Note 14)		
Annual surplus	\$ 20,058,109	\$ 15,774,340	\$ 17,358,350
Acquisition of tangible capital assets	(35,605,594)	(17,557,470)	(12,920,228)
Contributed tangible capital assets	-	(3,390,070)	(5,985,109)
Amortization expense	5,945,271	6,829,876	6,486,818
Gain on disposal of tangible capital assets	-	(72,770)	(17,681)
Proceeds on sale of tangible capital assets	-	118,532	139,723
	<u>(29,660,323)</u>	<u>(14,071,902)</u>	<u>(12,296,477)</u>
Other non-financial assets			
Decrease (increase) in inventory	-	41,031	(134,318)
Decrease (increase) in prepaid expenses	-	(78,153)	(179,655)
	<u>-</u>	<u>(37,122)</u>	<u>(313,973)</u>
Change in net financial assets	(9,602,214)	1,665,316	4,747,900
Net financial assets, beginning of year	<u>22,801,851</u>	<u>22,801,851</u>	<u>18,053,951</u>
Net financial assets, end of year	<u>\$ 13,199,637</u>	<u>\$ 24,467,167</u>	<u>\$ 22,801,851</u>

District of Squamish
Consolidated Statement of Cash Flows

For the year ended December 31, 2018	2018	2017
Cash provided by (used in)		
Operating transactions		
Annual surplus	\$ 15,774,340	\$ 17,358,350
Non-cash items included in annual surplus		
Amortization expense	6,829,876	6,486,818
Contributed tangible capital assets	(3,390,070)	(5,985,109)
Gain on disposal of tangible capital assets	(72,770)	(17,681)
Provision for post employment benefit	130,000	78,200
Development cost charge revenue recognized	(2,470,524)	(412,524)
Other deferred revenue recognized	27,175	335,843
Earnings on debt sinking funds (actuarial adjustment)	(565,171)	(671,343)
Provision for landfill closure	77,405	234,970
Changes in other non-cash working capital	6,881,361	(2,140,363)
	<u>23,221,622</u>	<u>15,267,161</u>
Investing transactions		
Change in portfolio investments	43,548,251	(200,990)
Capital transactions		
Acquisition of tangible capital assets	(17,557,470)	(12,920,228)
Proceeds from sale of tangible capital assets	118,532	139,723
	<u>(17,438,938)</u>	<u>(12,780,505)</u>
Financing transactions		
Development cost levies received, including interest	4,129,150	1,729,555
Lease payments	(45,908)	(29,845)
Proceeds of short-term debt	338,775	1,723,595
Proceeds of long-term debt	632,258	1,919,060
Debt principal repaid	(1,581,979)	(1,556,289)
	<u>3,472,296</u>	<u>3,786,076</u>
Increase in cash	52,803,231	6,071,742
Cash and cash equivalents, beginning of year	34,799,111	28,727,369
Cash and cash equivalents, end of year	\$ 87,602,342	\$ 34,799,111
Supplemental information:		
Interest paid	\$ 1,098,630	\$ 1,194,060

District of Squamish Notes to the Consolidated Financial Statements

December 31, 2018

The Notes to the Consolidated Financial Statements are an integral part of these financial statements. The following explains the significant accounting policies and reporting principles underlying these statements. The Notes also provide relevant supplementary information and explanations.

1. Status of the District of Squamish

The District of Squamish (the "District") was incorporated on December 15, 1964 pursuant to the *Local Government Act*, a statute of the Legislature of the Province of British Columbia (the "Province"). The District is subject to the provisions of the *Community Charter* and legislation under the Province. The District's principal activity is providing property tax-funded services, such as general government, protective (police and fire), transportation, economic and community development, and parks and recreation. The District provides public utilities for solid waste, water and sanitary services. The District also operates a cemetery and an aquatic centre (which is owned and governed by the Squamish-Lillooet Regional District) and provides funding to subsidiaries to provide the community with library and other services.

2. Significant Accounting Policies

The consolidated financial statements have been prepared by management in accordance with Canadian public sector accounting standards (PSAS) as prescribed by the Public Sector Accounting Board (PSAB) of the Chartered Professional Accountants of Canada. The significant accounting policies are summarized below:

Basis of consolidation

The consolidated financial statements include the assets, liabilities, reserves, surpluses/deficits, revenues and expenses of those District funds and government functions or entities which have been determined to comprise a part of the aggregate District operations based upon control exercised by the District. Inter-fund and inter-corporate balances and transactions have been eliminated.

i) Consolidated entities

The organizations (referred to as subsidiaries or civic corporations) included in the consolidated financial statements are as follows:

Squamish Public Library ("SPL"), which was incorporated without share capital as a municipal library of the District on May 15, 2003.

Squamish Sustainability Corporation ("SSC"), which was incorporated with the District as the sole shareholder on October 13, 2005.

District of Squamish Notes to the Consolidated Financial Statements

December 31, 2018

2. Significant Accounting Policies (continued)

ii) Squamish District Community Pool

The Squamish-Lillooet Regional District ("SLRD") has contracted with the District to provide aquatic centre ("Squamish District Community Pool") recreational services. The District provides the programs and services at the Squamish District Community Pool on behalf of the SLRD. This facility was established and constructed under authority of the SLRD Service Area Establishment Bylaw No. 438. The related assets, liabilities, revenues and expenses are reported in the SLRD financial statements, as the taxing authority and owner of the facility. Therefore, the District does not include any portion of the Squamish District Community Pool financial position or operations in the consolidated financial statements.

Basis of accounting

The consolidated financial statements are prepared using the accrual basis of accounting. The accrual basis of accounting records revenue as it is earned and measurable. Expenses are recognized as they are incurred and measurable based upon receipt of goods or services and/or the creation of a legal obligation to pay.

i) Fund accounting

As a local government, the District uses fund accounting. The resources and operations of the District have been segregated for accounting and financial reporting purposes into the following funds, which are presented as supplementary information: General, Solid Waste, Water and Sewer.

ii) Segment disclosure

The District also segregates its operations for financial reporting based upon group of activities / services. A segment is defined as a distinguishable activity or group of activities/services of a government for which it is appropriate to separately report financial information. The District provides this additional segment information in Schedule 3.

Investments

The District's investments are held in term deposits and marketable securities with the Municipal Finance Authority ("MFA") which consist of bond and intermediate funds recorded at fair value, which approximates cost. The investment funds held by the District for the SLRD are not included in the consolidated financial statements.

The District consolidates SSC's interest in a limited partnership. The investment was initially recorded at nominal value because the fair value of the investment was not determinable.

Deferred revenue

Government transfers, contributions and other amounts are received from third parties pursuant to legislation, regulation or agreement and may only be used in the conduct of certain programs, in the completion of specific work or for the acquisition and construction of tangible capital assets. In addition, certain user fees and development cost levies ("DCLs") or development cost charges ("DCCs") are collected for which the related services or capital costs have yet to be performed. Revenue is recognized in the period when the related expenses (such as development costs) are incurred, services performed or the tangible capital assets are acquired.

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

2. Significant Accounting Policies (continued)

Debt

Debt is recorded net of principal repayments and actuarial adjustments.

Contaminated sites

Governments are required to accrue a liability for the costs to remediate a contaminated site. The District should recognize a liability when an environmental standard exists, contamination exceeds the standard, the government has responsibility for remediation, future economic benefits will be given up and a reasonable estimate can be made.

Management has assessed its potential liabilities, including sites that are no longer in productive use and sites for which the District accepts responsibility. There are no such sites that have contamination in excess of an environmental standard which require remediation at this time, therefore no liability has been recognized in these financial statements.

Solid waste landfill

The obligation of closure and post-closure costs associated with the solid waste landfill site is based on the present value of estimated future expenses.

Employee future benefits

The District and its employees make contributions to the Municipal Pension Plan (a jointly trustee pension plan). The District's contributions are expensed as incurred.

Post employment benefits also accrue to the District's employees. The liabilities related to these benefits are actuarially determined based on services and best estimates of retirement ages and expected future salary and wage increases. The liabilities under these benefit plans are accrued based on projected benefits as the employees render services necessary to earn the future benefits.

Non-financial assets

Non-financial assets are held for use in the provision of goods and services but are not available to discharge existing liabilities. These assets may have a useful life extending beyond the current year and are not intended for sale in the ordinary course of operations.

Intangible assets, such as water rights and mineral resources, are not recorded in the financial statements.

Tangible capital assets

Tangible capital assets are recorded at cost, which includes amounts that are directly attributable to the acquisition, construction, development or betterment of the assets. The cost, less residual value, of the tangible capital assets (excluding land) is amortized on a straight-line basis over their estimated useful life as follows:

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

2. Significant Accounting Policies (continued)

Tangible capital assets (continued)

Fund	Asset Category	Useful Life Range (years)
General	Land	n/a
	Land improvements	5 to 200
	Buildings	5 to 60
	Furniture, vehicles & equipment	3 to 40
	Transportation infrastructure	5 to 100
Solid Waste	Solid waste infrastructure	12 to 50
Water	Water infrastructure	5 to 100
Sewer	Sanitary sewer infrastructure	5 to 100

Tangible capital assets, including assets under construction are recorded at cost. Amortization is charged over the asset's useful life in a rational and systematic manner, considering cost less any residual value, in accordance with PS 3150. Assets under construction are not amortized until the asset is substantially complete and ready for use.

Contributed tangible capital assets are recognized at fair value (using various methods including actual developer costs, appraisals, assessed values or professional estimations) at the date of contribution and are also recognized as revenue. Where an estimate of fair market value cannot be made, the tangible capital asset is recognized at nominal value.

Leases are classified as capital or operating leases. Leases which transfer substantially all of the benefits and risks incidental to ownership of property are accounted for as leased tangible capital assets. All other leases are accounted for as operating leases and the related lease payments are charged to expenses as incurred.

The District's tangible capital assets do not include works of art, historical artifacts/treasures or natural environment assets.

Inventories

Inventories held for consumption are recorded at the lower of cost and replacement cost. Donated materials are initially recorded at their fair market value, if determinable, and subsequently at the lower of cost and replacement cost.

Tax revenues

Tax revenues are recognized as revenue in the year they are levied, because the tax revenues result from non-exchange transactions that are compulsorily paid to local governments in accordance with the laws and regulations established to provide revenue to the District for the provision of public services. The tax revenues include levies on behalf of consolidated entities, business improvement area(s) and utility frontage taxes.

The property tax revenue relies on market assessments of land value that are subject to appeal. Through the British Columbia Assessments appeal process, taxes may be adjusted by way of supplementary roll adjustments. Estimates are made of potential adjustments to taxes. Any additional adjustments required over those estimated are recognized at the time they are awarded.

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

2. Significant Accounting Policies (continued)

Tax revenues (continued)

The District is required by the Province and other taxing authorities to collect and remit levies in respect of properties. The District has no jurisdiction or control over these levies. Therefore, levies imposed by other taxing authorities are not included in these consolidated financial statements.

Government transfers

Restricted transfers from governments are deferred and recognized as revenue as the related expenses are incurred or the stipulations in the related agreements are met. Unrestricted transfers are recognized as revenue when received or if the amount to be received can be reasonably estimated and collection is reasonably assured.

Other revenues

The District recognizes other revenue in the period in which the transactions or events occurred that gave rise to the revenues. Revenues are recorded on an accrual basis except when the accruals cannot be determined with a reasonable degree of certainty or when estimates are impractical.

Estimates

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues, expenses and contingent liabilities. Actual results will depend on future economic events and could differ from those estimates. The significant areas requiring management estimates include provision for landfill closure and post closure costs, provision for post employment benefits and the useful lives of tangible capital assets.

Budget

The 2018 budget is included on the consolidated statements of operations and accumulated surplus and change in net financial assets. The budget does not include financial plan amendments (Note 14).

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

3. Cash and cash equivalents

	2018	2017
Cash	\$ 5,367,641	\$ 27,971,567
Cash equivalents	82,104,828	6,724,011
Cash held by civic corporations	129,873	103,533
	\$ 87,602,342	\$ 34,799,111

During 2018 investments and cash holdings were transferred to a notice plan with Scotiabank. This is a high interest savings plan that requires 30 days notice to liquidate and accrues interest at a rate of the Bank of Nova Scotia prime rate + 0.25%.

In 2017, cash equivalents consisted of deposits in the Municipal Finance Authority ("MFA") short-term money market investment pool. These investments were highly liquid and readily convertible to known amounts of cash.

4. Investments

	2018	2017
Bond funds	\$ -	\$ 3,354,896
Intermediate funds	-	40,204,088
Investments held by civic corporations	247,066	236,333
	\$ 247,066	\$ 43,795,317

Investments held by civic corporations are cashable term deposits with maturity dates between June 4, 2019 to July 5, 2019, earning interest between 1.40% to 1.45%.

On February 3, 2016, the District's civic corporation 0685492 BC Ltd. sold land to a third party (or "purchaser") for cash consideration and a 25% limited partnership ("LP") interest in the prospective development. 0685492 BC Ltd. was dissolved in 2017 and the interest in the LP was transferred to the SSC, another civic corporation. The fair value of this interest is not determinable as it is dependent on future development and has therefore been recorded at nominal amount.

As condition of the sale, the third party agreed that 5.57 hectares of the property would be contributed to the District for use as a municipal park. A provision allows the general partner of the LP the option to purchase the LP at any time after the completion of the municipal park to a state that is usable by and accessible to the public.

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

5. Accounts receivable

	<u>2018</u>	<u>2017</u>
Property taxes	\$ 1,550,526	\$ 1,540,237
Government transfers receivable	1,293,506	2,254,048
Utilities	762,233	832,027
GST	464,727	387,435
Trade accounts and other	726,553	687,141
Allowance for doubtful accounts	(4,915)	(4,344)
	<u>\$ 4,792,630</u>	<u>\$ 5,696,544</u>

The District receives government transfers from senior levels of government, including the Province of British Columbia and the Federal Government of Canada.

The District, as a local government, receives goods and services tax (GST) rebates and claims from the Canada Revenue Agency, Government of Canada.

6. Debenture deposits

	<u>2018</u>	<u>2017</u>
General	\$ 328,984	\$ 309,832
Solid waste	5,963	5,726
Water	90,048	86,526
Sewer	78,891	78,453
	<u>\$ 503,886</u>	<u>\$ 480,537</u>

The District issues its debt instruments through the MFA. A portion of the debenture proceeds is withheld in the debt reserve fund by the MFA; these are considered District cash deposits and are a condition of the borrowings.

7. Accounts payable, accrued and other liabilities

	<u>2018</u>	<u>2017</u>
Trade accounts payable and accrued liabilities	\$ 11,412,728	\$ 5,568,062
Wages and benefits payable	901,553	918,751
Interest payable	191,238	115,811
Deposits	4,296,728	4,161,704
	<u>\$ 16,802,247</u>	<u>\$ 10,764,328</u>

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

8. Deferred Revenue

	2018	2017
Development cost levies, beginning of year	\$ 17,885,204	\$ 16,568,174
Contributions	3,676,175	1,605,966
Interest earned	452,974	123,588
less: Expenditures	<u>(2,470,524)</u>	<u>(412,524)</u>
Development cost levies, end of year	<u>19,543,829</u>	<u>17,885,204</u>
Other deferred revenue	<u>3,982,049</u>	<u>3,954,874</u>
	<u>\$ 23,525,878</u>	<u>\$ 21,840,078</u>

Deferred revenue are short-term in nature, with the exception of the deferrals dedicated for developments and capital projects. The development cost charges are funds restricted by bylaw for the purpose which they were collected from developers. The District holds these restricted funds in accounts (general, water and sewer) for the intended use of the funds.

9. Debt

The District's debt segregated by fund and other:

	2018	2017
General	14,126,892	14,901,276
Solid waste	312,946	363,399
Water	4,449,161	4,864,135
Sewer	3,163,618	3,484,607
Other	<u>2,062,370</u>	<u>1,723,595</u>
Total long-term debt	<u>\$ 24,114,987</u>	<u>\$ 25,337,012</u>

Other debt consists of District borrowing that may be considered short-term and debt held by civic corporations.

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

9. Debt (continued)

The District's debt by specific by-law:

Fund	Maturity year	Interest rate	Purpose	Bylaw	2018	2017
General						
	2020		Capital leases	n/a	\$ 46,568	\$ 92,475
	2022	1.75	Police building	1613	1,394,228	1,702,301
	2026	1.75	Forestry building	1917	1,373,609	1,516,951
	2027	2.25	Business Park	1945	1,725,705	1,882,500
	2029	4.90	Business Park	2029	1,869,372	2,002,653
	2031	4.20	Arena Roof	2064	521,630	551,796
	2031	4.20	Roads & Drainage	2051	817,931	865,232
	2022	2.90	Facilities	2137	241,881	296,640
	2027	2.90	General Capital Works	2166	908,988	991,578
	2023	3.85	General Capital Works	2166	243,184	286,356
	2023	3.85	Facilities	2137	65,549	77,169
	2033	3.85	General Capital Works	2208	378,765	396,953
	2023	3.85	General Capital Works	2208	234,358	275,963
	2023	3.85	Parks Capital Works	2214	99,379	117,021
	2031	3.00	Dike Construction & Rehabilitation	2051	300,685	313,932
	2029	3.00	Flood Protection	2166	88,803	95,134
	2024	3.00	Systems & Equipment	2208	73,201	83,813
	2029	3.00	Bridge, Flood Protection, Arena Lighting	2208	656,665	703,484
	2029	3.00	Bridge	2282	273,255	292,738
	2035	2.75	General Capital Works	2051	90,140	93,976
	2030	2.75	General Capital Works	2331	46,044	49,090
	2030	2.75	General Capital Works	2282	561,640	598,802
	2031	2.10	General Capital Works	2051	499,418	530,464
	2022	1.95	General Capital Works	2208	219,225	270,100
	2032	3.15	General Capital Works	2282	601,575	635,757
	2027	3.15	General Capital Works	2392	162,836	178,398
	2033	3.20	General Capital Works	2530	321,869	
	2033	2.90	General Capital Works	2534	310,389	
					\$14,126,892	\$14,901,276
Solid waste						
	2025	2.75	Solid Waste Capital Works	2137	\$ 150,494	\$ 169,185
	2023	3.85	Solid Waste Capital Works	2137	103,261	121,609
	2022	2.90	Solid Waste Capital Works	2137	59,191	72,605
					312,946	363,399

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

9. Debt (continued)

Water						
2020	2.10	Powerhouse Springs	1572	157,324	230,942	
2027	2.25	Water Systems	1944	230,674	251,633	
2032	2.90	Water Systems	2167	245,862	258,786	
2029	4.90	Water Systems	2052	424,573	454,844	
2032	2.90	Water Systems	2138	198,838	209,291	
2031	4.20	Water Capital Works	2052	433,274	458,331	
2028	3.85	Water Capital Works	2209	621,232	670,984	
2023	3.85	Watermain Replacement	2167	170,044	200,231	
2029	3.00	PRV, Meters, Stations, Mains	2167	160,388	171,823	
2029	3.00	Watermain Replacement	2209	279,305	299,219	
2029	3.00	Water Capital Works	2283	706,244	756,597	
2030	2.75	Water Capital Works	2283	161,665	172,362	
2022	1.95	Water Capital Works	2209	181,843	224,042	
2032	3.15	Water Capital Works	2445	477,895	505,050	
				4,449,161	4,864,135	
Sewer						
2018	4.65	WWTP	1513	-	9,782	
2024	2.40	WWTP Mamquam	1756	1,197,423	1,365,082	
2028	3.65	Sewer Mains	1977	386,152	417,078	
2032	2.90	Trunk Sanitary Sewer Mains	2156	368,961	388,356	
2033	3.85	Sewer Capital Works	2168	155,987	163,478	
2029	3.00	Sanitary Sewer Trunk Line	2156	114,485	122,647	
2029	3.00	Centrifuge, Trunk, Lift Station, Crane	2211	213,832	229,078	
2030	2.75	Sewer Capital Works	2211	640,945	683,365	
2022	1.95	Sewer Capital Works	2211	85,824	105,741	
				3,163,618	3,484,607	
Other						
temporary		Arena Slab Upgrade	2543	1,167,124	1,167,124	
temporary		Technology Project	2544	303,030	303,030	
temporary		Tantalus Firehall Upgrade	2545	592,216	253,441	
				2,062,370	1,723,595	
				\$24,114,987	\$25,337,012	

Debt includes actuarial additions, which represent projected earnings on the sinking fund deposits. The actuarial additions are \$8,015,064 in 2018 (2017 - \$8,499,878).

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

9. Debt (continued)

Debt (sinking fund contributions on existing MFA loans) to be retired over the next five years, segregated by fund/other:

	2019	2020	2021	2022	2023	2024+
General	\$ 1,096,321	\$ 1,080,654	\$ 1,065,204	\$ 1,065,204	\$ 821,124	\$ 3,820,353
Solid waste	44,134	44,134	44,134	44,134	33,118	34,896
Water	331,235	331,235	295,600	295,600	253,400	1,483,426
Sewer	213,303	213,303	213,303	213,303	193,386	807,049
Other	2,062,370	-	-	-	-	-
	\$ 3,747,363	\$ 1,669,326	\$ 1,618,241	\$ 1,618,241	\$ 1,301,028	\$ 6,145,724

Authorized but unissued debt is \$19,322,297 in 2018 (2017 - \$18,302,031).

10. Provision for solid waste landfill

The District has ongoing assessments and work performed to determine the timeframe and costs of closure and post closure costs associated with the landfill. The estimates are based on District Engineering reports and calculations performed by consultants.

The liability is calculated based on the ratio of cumulative usage to total capacity of the site by volume and the discounted estimated future cash flows associated with closure and post closure activities. An estimate for inflation is incorporated into the calculation. Cash flows are discounted at 3.94% (2017 - 3.98%) per annum and inflation is estimated at 1.48% (2017 - 1.30%) per annum.

The reported liability is based on estimates and assumptions with respect to capacity, usage and events extending over the remaining life of the landfill.

In 2016, the District began a vertical expansion of the landfill, increasing its capacity and extending its estimated closure date. The District is currently in the build phase of the expansion. All estimates used in the calculation at December 31, 2018 are based on the expected results of the expansion.

As of December 31, 2018 the total capacity of the landfill after the expansion is estimated at 835,010 cubic meters. Assuming this total capacity, the current remaining capacity of the landfill site is estimated at 179,000 cubic meters (2017 - 196,000 cubic meters) which is 21.4% (2017 - 23.5%) of the site's total planned capacity after the expansion.

The total discounted future cash flows for closure and post closure costs are estimated at \$3,087,345 as at December 31, 2018 (2017 - \$3,009,940). The landfill is expected to reach capacity by 2027.

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

11. Provision for post-employment benefits

Information regarding the District's obligations for post-employment benefits is as follows:

	<u>2018</u>	<u>2017</u>
Liability, beginning of year	\$ 1,018,300	\$ 940,100
Current service cost	100,800	93,400
Interest cost	33,000	33,400
Benefits paid	-	(41,900)
Past service cost	(9,600)	(7,900)
Amortization of net actuarial loss	5,800	1,200
Liability, end of year	<u>\$ 1,148,300</u>	<u>\$ 1,018,300</u>

The District provides future benefits to all of its eligible employees through a Sick Leave Plan, a Full Annual Vacation at Retirement Plan, and a Retirement Pay Plan (collectively as the "Plans"). The Sick Leave Plan entitles employees to twelve sick days per year, based on one day for each month of service, up to a maximum of 150 days. Sick leave benefits can be used by the employee at any point up to their retirement date.

The Full Annual Vacation at Retirement Plan entitles employees to receive full annual vacation or vacation pay on retirement irrespective of the month of retirement. This benefit would be paid out in full to the employee upon their retirement. The Retirement Pay Plan entitles an employee to two days pay at the employee's normal rate of pay for each year or part of year worked. The benefit would be paid out in full to the employee upon their retirement.

There were no amendments to the above Plans during the year ended December 31, 2018. The total expense recorded in the financial statements in respect of obligations under the Plan amounts to \$139,600 (2017 - \$128,000).

Actuarial gains and losses are amortized over eleven years, being the expected average remaining service period of the related employee group, commencing the year after the gain or loss arises.

	<u>2018</u>	<u>2017</u>
Accrued benefit obligation, end of year	\$ 1,072,800	\$ 1,028,600
Unamortized loss (gain)	75,500	(10,300)
Liability, end of year	<u>\$ 1,148,300</u>	<u>\$ 1,018,300</u>

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

11. Provision for post-employment benefits (continued)

The most recent actuarial valuation of the District's employee future benefits was completed as at December 31, 2017. The significant actuarial assumptions adopted in measuring the District's accrued benefit obligation are as follows:

	2018	2017
Discount rates	3.30%	3.00%
Expected future inflation rates	2.50%	2.50%
Expected wage and salary increases	2.5 - 4.6%	2.5 - 4.6%

12. Accumulated Surplus

	2018	2017
Unappropriated surplus	\$ 5,499,918	\$ 7,954,992
Appropriated surplus		
Non-statutory reserves (provisions)	5,968,815	7,463,345
Statutory reserves (Schedule 4)	37,543,233	33,113,216
	49,011,966	48,531,553
Investment in tangible capital assets	229,419,673	214,125,746
	\$ 278,431,639	\$ 262,657,299

The unappropriated surplus is the amount of accumulated surplus remaining after deducting the other accumulated surplus components. It is available to temporarily finance operations until planned revenues and borrowing proceeds are received, can be employed for emergency expenditures and, if included in the annual financial plan bylaw, employed to stabilize taxation and utility fee rates.

Appropriated surplus is the amount of accumulated surplus, supported by a portion of the District's cash and receivables, that has been set aside by decision of Council for a specified purpose. The statutory reserves have been established by bylaw in accordance with the *Community Charter* and their use is restricted by the legislation. In the normal course of operations, these funds will be used to finance the future services or capital works for which they have been appropriated.

Investment in tangible capital assets is equal to the net book value of the tangible capital, less related long term debt. In the normal course of operations, the tangible capital assets will be used to provide services and debt is repaid by future period revenues.

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

13. Contractual Obligations and Contingencies

(a) **Litigation**

The District is currently involved in certain legal actions and other existing conditions involving uncertainty. Financial implications of potential claims against the District, resulting from such litigation, and that are not covered by insurance, are accrued to the extent that amounts can be reasonably estimated. Otherwise, such claims are to be recognized in the year in which an obligation is determined.

As at December 31, 2018, there were legal claims in various stages of litigation for which management is unable to determine the outcome. The outstanding claims are not expected to result in a material loss to the District. As such, no provision has been made in the financial statements for these claims. Losses, if any, resulting from these actions will be recorded in the period the loss becomes known and the amounts are determinable.

(b) **Pension liability**

The District and its employees contribute to the Municipal Pension Plan (a jointly trustee pension plan). The board of trustees, representing Plan members and employers, is responsible for administering the Plan, including investment of assets and administration of benefits. The Plan is a multi-employer defined benefit pension plan. Basic pension benefits are based on a formula. As at December 31, 2018, the Plan has about 197,000 active members and approximately 95,000 retired members. Active members include approximately 39,000 contributors from local governments.

Every three years an actuarial valuation is performed to assess the financial position of the Plan and the adequacy of Plan funding. The actuary determines an appropriate combined employer and member contribution rate to fund the Plan. The actuary's calculated contribution rate is based on the entry-age normal cost method, which produces the long term rate of member and employer contributions sufficient to provide benefits for average future entrants to the Plan. This rate may be adjusted for the amortization of any actuarial funding surplus and will be adjusted for the amortization of any unfunded actuarial liability.

The most recent valuation as at December 31, 2015 indicated a \$2,224 million funding surplus for basic pension benefits on a going concern basis. As a result of the 2015 basic account actuarial valuation surplus and pursuant to the joint trustee agreement, \$1,927 million was transferred to the rate stabilization account and \$297 million of the surplus ensured the required contribution rates unchanged.

In 2018, the District paid \$1,234,019 (2017 - \$1,108,354) for employer contributions and employees contributed \$1,093,741 (2017 - \$987,556) to the Plan.

The next valuation will be as at December 31, 2018 with results available in 2019.

Employers participating in the Plan record their pension expense as the amount of employer contributions made during the fiscal year (defined contribution pension plan accounting). This is because the Plan records accrued liabilities and accrued assets for the Plan in aggregate resulting in no consistent and reliable basis for allocating the obligation, assets and cost to the individual employers participating in the Plan.

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

13. Contractual Obligations and Contingencies (continued)

(c) Demand notes

The District issues its debt instruments through the MFA. The District also executes demand notes in connection with each debenture whereby the District may be required to loan amounts to the MFA. These demand notes are contingent in nature and are not reflected in the consolidated financial statements.

(d) Squamish Oceanfront front ender and municipal share agreements

As permitted under the Local Government Act, The District entered into a Development Cost Charge (DCC) Front Ender Agreement and Municipal Share Agreements in 2015 for specified off-site infrastructure projects necessary for the development of Oceanfront Lands sold to Matthews Southwest and Bethel Lands Corporation (The Developer) in 2014.

The Agreements provide for the reimbursement of a maximum of \$33,915,438 over a 20 year period for specified DCC projects that the Developer pays for and builds on behalf of the District. Within the agreements there are conditions and restrictions that may limit the reimbursement paid by the District. A key restriction is that reimbursement for most of the specified projects may not exceed 78% of DCC collections received by the District per quarter during the time when invoices are outstanding, and that any amounts outstanding at the end of the 20 year term are forgiven.

Only projects identified in the Municipal Share Agreements are eligible for reimbursement of the municipal share portions of the project and only at the time of project completion. The District has discretion to fund and build any project identified in the Agreements and the Developer is not bound to proceed with development activities.

14. Financial Plan

For 2018, the financial plan amounts presented throughout the consolidated financial statements are based on the Financial Plan bylaw 2589 adopted by Council on March 6, 2018. The financial plan does not include certain revenues for transfers from reserves and internal sources, and debt proceeds and also does not include capital expenditures for tangible capital assets.

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

15. Taxation and utility revenues

Collection for District

The following shows the collections in 2018 for District purposes, including applicable civic corporations:

	Financial Plan	2018	2017
Taxation			
General property levies	\$ 27,679,653	\$ 27,605,650	\$ 26,132,437
Business improvement area	89,303	91,428	85,001
Library levies	-	-	52,771
Water frontage levies	268,785	253,242	252,351
Sewer frontage levies	324,760	306,000	304,840
	<u>28,362,501</u>	<u>28,256,320</u>	<u>26,827,400</u>
Other property levies			
Grants-in-lieu of property levies	727,071	718,426	683,702
Hotel tax	180,000	332,325	256,045
1% utility revenue	276,660	276,670	267,384
Penalties and interest on property levies	335,000	287,798	333,333
	<u>1,518,731</u>	<u>1,615,219</u>	<u>1,540,464</u>
	<u>29,881,232</u>	<u>29,871,539</u>	<u>28,367,864</u>
Utility user fees			
Water	4,149,074	4,199,744	4,074,963
Sewer	5,634,598	5,695,749	5,496,294
Solid waste	4,097,565	4,214,676	3,990,302
	<u>13,881,237</u>	<u>14,110,169</u>	<u>13,561,559</u>
	<u>\$ 43,762,469</u>	<u>\$ 43,981,708</u>	<u>\$ 41,929,423</u>

Collection for other agencies

The following amounts were collected on behalf of and remitted to other taxing authorities, and are not included on the District's Consolidated Statement of Operations:

	2018	2017
Province of BC School Taxes	\$ 11,542,830	\$ 11,280,796
BC Assessment Authority	370,447	353,858
Municipal Finance Authority	1,610	1,416
Squamish Lillooet Regional District	1,641,719	1,559,945
Sea to Sky Regional Hospital District	288,793	261,048
	<u>\$ 13,845,399</u>	<u>\$ 13,457,063</u>

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

16. Government transfers and other contributions

	2018	2017
Operating		
Province of British Columbia		
Community protection and emergency	\$ 431,261	\$ 439,814
Support for provincial programs	354,904	427,015
Climate action	33,848	29,962
Seniors grant	-	5,440
	820,013	902,231
 Government of Canada	5,423	37
 Other		
UBCM - Community Works Fund	990,766	786,363
SLRD	2,500	19,215
Support from other agencies	24,720	35,626
Support for civic corporations	114,649	105,981
	1,132,635	947,185
 Total operating	1,958,071	1,849,453
Capital		
Province of British Columbia	970,108	2,341,378
Other	-	196,859
	970,108	2,538,237
Total capital	970,108	2,538,237
	\$ 2,928,179	\$ 4,387,690

17. Trust Funds

The District trust funds account for assets that must be administered as directed by agreement or statute for certain beneficiaries. In accordance with the recommendations of the Public Sector Accounting Board, trust funds are not included in the District's consolidated financial statements.

The District operates the Mount Garibaldi Cemetery and maintains the Cemetery Care Fund in accordance with the Cemeteries and Funeral Services Act. The following trust funds are administered by the District and are excluded from these consolidated financial statements.

Cemetery Care Fund financial position as at December 31, 2018:

	2018	2017
Financial Assets		
Cash and investments	\$ 238,718	\$ 227,006
 Liabilities		
Cemetery Care Fund	\$ 238,718	\$ 227,006

District of Squamish Notes to the Consolidated Financial Statements

December 31, 2018

18. Segmented Information

The District is a diversified municipal government that provides a wide range of services to its citizens, including General Government; Protective Services; Transportation and Transit; Economic and Community Development; Recreation, Parks, Trails and Library; Public Health; Water, Sewer and Solid Waste Utilities. For management reporting purposes, the District's operations and activities are organized and reported by Fund. Funds were created for the purpose of recording specific activities to attain certain objectives in accordance with special regulations, restrictions or limitations.

Municipal services are provided by departments and their activities reported within these funds. Certain functions that have been separately disclosed in the segmented information, along with the services they provide, are as follows:

General Government

General government and fiscal services is comprised of Council and the related support services provided by the Administration and Finance departments, as well as all operations and maintenance costs relating to Municipal Hall and grants to community organizations.

Protective Services

Protective Services is is comprised of police, fire, emergency management planning, bylaw enforcement, animal control and building inspection.

Transportation and Transit

Transportation and Transit is a broad function comprised of engineering departments and the public works crews engaged in the maintenance and improvements to the road systems, drainage, sidewalks, flood protection, fleet maintenance, works yard maintenance and other planning and maintenance activities. In addition, this function includes transit services and airport operations.

Economic and Community Development

Economic and Community Development is comprised of planning and land use development, environmental planning, economic development and events management with the common goal of developing Squamish into a healthy, vibrant and economically viable community. In addition, the District's civic corporation, Squamish Sustainability Corporation has been consolidated into this function for reporting purposes.

Recreation, Parks, Trails and Library

Recreation, Parks, Trails and Library is comprised of the arena and community centre, seniors centre, youth centre and an extensive networks of parks and trail systems throughout the community. In addition, the District's civic corporation, the Squamish Public Library, has been consolidated into this function for reporting purposes.

District of Squamish
Notes to the Consolidated Financial Statements

December 31, 2018

18. Segmented Information (continued)

Public Health

Public Health Service is comprised of the municipal cemetery services, social and housing initiatives.

Water and Sewer Utilities

The Water and Sewer Utilities is comprised of the water and sewer system networks, storm mains and pump stations.

Solid Waste Utility

The Solid Waste Utility is comprised of garbage, recycling, organic waste collection services as well as the operation of the landfill.

19. Comparative figures

The comparative figures have been reclassified to conform with the consolidated financial statement format adopted in the current year.

District of Squamish
Schedule 1 - Tangible capital assets

December 31, 2018	Land	Land Improvements	Buildings	Furniture, Vehicles and Equipment	Transportation Infrastructure	Solid Waste Infrastructure	Water Infrastructure	Sewer Infrastructure	Assets Under Construction	2018 Actual
COST										
Opening Balance	\$ 59,923,355	\$ 28,164,738	\$ 41,037,858	\$ 15,020,098	\$ 86,326,629	\$ 5,424,146	\$ 52,689,185	\$ 53,633,080	\$ 7,409,950	\$ 349,629,039
Add: Additions	575,548	1,127,784	726,762	2,451,204	3,110,836	-	3,992,907	3,704,851	9,018,633	24,708,525
Less: Disposals and transfers	-	-	-	(964,047)	(140,259)	-	-	-	(3,760,985)	(4,865,291)
Closing Balance	<u>60,498,903</u>	<u>29,292,522</u>	<u>41,764,620</u>	<u>16,507,255</u>	<u>89,297,206</u>	<u>5,424,146</u>	<u>56,682,092</u>	<u>57,337,931</u>	<u>12,667,598</u>	<u>369,472,273</u>
ACCUMULATED AMORTIZATION										
Opening Balance	-	7,909,887	18,090,879	9,049,984	34,875,370	1,377,937	18,004,497	20,857,727	-	110,166,281
Add: Amortization	-	646,197	847,381	830,724	2,257,179	315,457	963,299	969,639	-	6,829,876
Less: Acc Amortization on disposals	-	-	-	(957,104)	(101,440)	-	-	-	-	(1,058,544)
Closing Balance	-	<u>8,556,084</u>	<u>18,938,260</u>	<u>8,923,604</u>	<u>37,031,109</u>	<u>1,693,394</u>	<u>18,967,796</u>	<u>21,827,366</u>	-	<u>115,937,613</u>
Net Book Value, year ended 2018	\$ 60,498,903	\$ 20,736,438	\$ 22,826,360	\$ 7,583,651	\$ 52,266,097	\$ 3,730,752	\$ 37,714,296	\$ 35,510,565	\$ 12,667,598	\$ 253,534,660

Contributed tangible capital assets (developer contributions) have been recognized at fair market value at the date of contribution. The value of contributed assets received during the year is \$3,390,070 (2017 - \$5,985,109) comprised of land, land improvements and other public infrastructure.

No write down of tangible capital assets occurred during 2018 or 2017.

District of Squamish
Schedule 2 - Tangible capital assets (prior year)

December 31, 2017	Land	Land Improvements	Buildings	Furniture, Vehicles and Equipment	Transportation Infrastructure	Solid Waste Infrastructure	Water Infrastructure	Sewer Infrastructure	Assets Under Construction	2017 Actual
COST										
Opening Balance	\$ 59,762,916	\$ 28,013,139	\$ 40,962,874	\$ 14,182,964	\$ 81,553,236	\$ 5,143,578	\$ 47,683,690	\$ 50,073,611	\$ 4,372,937	\$ 331,748,945
Add: Additions	160,439	151,599	28,034	1,420,464	4,294,789	-	5,040,969	2,069,976	5,739,067	18,905,337
Less: Disposals and transfers	-	-	46,950	(583,330)	478,604	280,568	(35,474)	1,489,493	(2,702,054)	(1,025,243)
Closing Balance	59,923,355	28,164,738	41,037,858	15,020,098	86,326,629	5,424,146	52,689,185	53,633,080	7,409,950	349,629,039
ACCUMULATED AMORTIZATION										
Opening Balance	-	7,265,963	17,278,010	8,894,970	32,946,479	1,048,633	17,148,517	20,000,092	-	104,582,664
Add: Amortization	-	643,924	812,869	826,023	2,125,609	329,304	891,454	857,635	-	6,486,818
Less: Acc Amortization on disposals	-	-	-	(671,009)	(196,718)	-	(35,474)	-	-	(903,201)
Closing Balance	-	7,909,887	18,090,879	9,049,984	34,875,370	1,377,937	18,004,497	20,857,727	-	110,166,281
Net Book Value, year ended 2017	\$ 59,923,355	\$ 20,254,851	\$ 22,946,979	\$ 5,970,114	\$ 51,451,259	\$ 4,046,209	\$ 34,684,688	\$ 32,775,353	\$ 7,409,950	\$ 239,462,758

District of Squamish
Schedule 3 - Segmented revenue and expenses by type

	General Government	Protective Services	Transportation & Transit	Economic & Community Development	Recreation, Parks, Trails & Library	Health, Social & Housing	Solid Waste Management	Water Services	Waste Water Services	Total All Funds 2018	Total All Funds 2017
Revenue:											
Taxation	\$ 27,697,078	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 253,242	\$ 306,000	28,256,320	\$ 26,827,400
Other property levies	1,282,894	-	-	332,325	-	-	-	-	-	1,615,219	1,540,464
Utility user fees	-	-	-	-	-	-	4,214,676	4,199,744	5,695,749	14,110,169	13,561,559
Other revenue	423,727	2,029,527	705,860	878,534	1,076,324	158,920	2,945	4,867	135	5,280,839	5,484,510
Government transfers for operating	966,871	325,759	299,301	157,174	126,149	50,000	12,817	-	20,000	1,958,071	1,849,453
Investment income	1,518,715	-	-	-	3,103	-	6,529	85,216	104,273	1,717,836	1,264,838
	31,889,285	2,355,286	1,005,161	1,368,033	1,205,576	208,920	4,236,967	4,543,069	6,126,157	52,938,454	50,528,224
Expenses:											
Payroll and benefits	4,778,327	3,077,372	3,383,595	1,378,073	3,640,820	42,325	-	720,212	641,320	17,662,044	16,839,564
Operating expenses	1,558,431	5,342,153	1,675,661	1,256,622	2,393,424	303,322	3,549,025	1,325,909	2,218,684	19,623,231	18,570,255
Debt service - interest	382,388	78,702	46,990	196,337	5,137	-	16,709	219,605	152,762	1,098,630	1,179,692
Amortization expense	4,461,909	-	-	11,241	108,330	-	315,457	963,299	969,639	6,829,875	6,486,818
	11,181,055	8,498,227	5,106,246	2,842,273	6,147,711	345,647	3,881,191	3,229,025	3,982,405	45,213,780	43,076,329
Annual surplus before other	20,708,230	(6,142,941)	(4,101,085)	(1,474,240)	(4,942,135)	(136,727)	355,776	1,314,044	2,143,752	7,724,674	7,451,895
Other:											
Government transfers for capital	-	23,500	387,344	-	-	-	-	559,264	-	970,108	2,538,237
Developer cost charges	-	-	1,409,699	-	-	-	-	25,267	1,035,558	2,470,524	412,524
Developer contributed assets	2,209,823	420	-	987,880	32,647	-	-	1,068,344	161,569	4,460,683	6,794,719
Connection Fees	-	-	1,028	-	-	-	-	69,120	5,433	75,581	143,294
Gain on disposal of tangible capital assets	18,513	56,700	4,500	-	(6,943)	-	-	-	-	72,770	17,681
	2,228,336	80,620	1,802,571	987,880	25,704	-	-	1,721,995	1,202,560	8,049,666	9,906,455
Annual surplus (deficit)	\$ 22,936,566	\$ (6,062,321)	\$ (2,298,514)	\$ (486,360)	\$ (4,916,431)	\$ (136,727)	\$ 355,776	\$ 3,036,039	\$ 3,346,312	\$ 15,774,340	\$ 17,358,350

District of Squamish
Schedule 4 - Continuity of reserves

Reserve Fund Transactions	Balance, beginning of year	Contributions	Investment income	Expenditures	Balance, end of year 2018	Balance, end of year 2017
General Sinking Fund Surplus	\$ 273,623	-	6,704	-	\$ 280,327	\$ 273,623
Water Works Sinking Fund Surplus	581,339	-	14,242	-	595,581	581,339
Sewer Works Sinking Fund Surplus	682,220	640	16,682	-	699,542	682,220
Land Sale Reserve Fund	11,886,756	-	291,237	-	12,177,993	11,886,756
Equipment Replacement	5,306,752	673,018	124,788	(1,103,953)	5,000,605	5,306,752
Community Works Fund/Public Transit	2,957,309	813,266	78,181	(345,986)	3,502,770	2,957,309
Capital Works, Rehabilitation and Replacement	10,267,876	3,509,317	290,661	(318,646)	13,749,208	10,267,876
Offstreet Parking	443,912	-	10,874	-	454,786	443,912
Affordable Housing	580,562	313,410	18,063	-	912,035	580,562
Carbon Neutral	125,791	33,848	3,498	-	163,137	125,791
VANOC Legacy	7,076	-	173	-	7,249	7,076
Economic Development Reserve	-	-	-	-	-	-
Total	\$ 33,113,216	\$ 5,343,499	\$ 855,103	\$ (1,768,585)	\$ 37,543,233	\$ 33,113,216

AUDITED FINANCIAL STATEMENTS



District of Squamish
December 31, 2019

District of Squamish Consolidated Financial Statements For the year ended December 31, 2019

Management's Responsibility

The Council of the District of Squamish is responsible for the preparation and objectivity of the consolidated financial statements and management of the District. Management is responsible for the judgments and estimates used in the preparation of the consolidated financial statements, accounting standards, and internal controls. Management is also responsible for the design, implementation, and maintenance of internal control systems to provide reasonable assurance that assets are protected and that transactions are properly authorized, and that financial information is reliable.

The Mayor and Council are responsible for the oversight of the District's internal control systems. Council is responsible for the design, implementation, and maintenance of internal control systems to provide reasonable assurance that assets are protected and that transactions are properly authorized, and that financial information is reliable.

The District's independent auditor is responsible for expressing an opinion on the consolidated financial statements based on the audit. The auditor's opinion is based on the audit of the consolidated financial statements and is not a guarantee of the accuracy of the financial information. The auditor's opinion is based on the audit of the consolidated financial statements and is not a guarantee of the accuracy of the financial information.

The consolidated financial statements are prepared in accordance with Canadian generally accepted accounting principles (GAAP). The consolidated financial statements are prepared in accordance with Canadian generally accepted accounting principles (GAAP).

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 Suite 202
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Auditor's Responsibilities

Our objectives are to obtain reasonable assurance that the financial statements as a whole are free from material misstatement. Our report that includes our opinion is based on the audit conducted that an audit conducted to detect a material misstatement in the financial statements is considered material if, in the context of the circumstances, it could reasonably be expected to influence the economic decisions of users.

As part of an audit in accordance with professional standards, we exercise professional judgment and maintain professional skepticism throughout the audit.

- Identify and assess the risks of material misstatement in the financial statements, whether due to fraud or error. The risk of not identifying a material misstatement is a function of the nature and extent of the procedures performed to address the risks. We obtain an understanding of the entity and its environment, including internal control, to assess the risks of material misstatement. We evaluate the design and implementation of internal control that is relevant to the audit. We evaluate the effectiveness of internal control that is relevant to the audit. We evaluate the design and implementation of internal control that is relevant to the audit.
- Obtain an understanding of the entity and its environment, including internal control, to assess the risks of material misstatement. We obtain an understanding of the entity and its environment, including internal control, to assess the risks of material misstatement. We obtain an understanding of the entity and its environment, including internal control, to assess the risks of material misstatement.
- Evaluate the design and implementation of internal control that is relevant to the audit. We evaluate the design and implementation of internal control that is relevant to the audit. We evaluate the design and implementation of internal control that is relevant to the audit.
- Conclude on the effectiveness of internal control, based on the audit. We conclude on the effectiveness of internal control, based on the audit. We conclude on the effectiveness of internal control, based on the audit.
- Evaluate the design and implementation of internal control that is relevant to the audit. We evaluate the design and implementation of internal control that is relevant to the audit. We evaluate the design and implementation of internal control that is relevant to the audit.

We communicate with management and those charged with governance about the results of the audit, including the scope and timing of the audit, the nature of the internal control that we

Independent Auditor's Report

To the Mayor and Councillors of the District of Squamish

Opinion

We have audited the accompanying consolidated financial statements of the District of Squamish (the "District"), which comprise the Consolidated Statement of Financial Position as at December 31, 2019, the Consolidated Statements of Change in Net Financial Assets, Operations, and Cash Flows for the year then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the District as at December 31, 2019, and the results of its operations, change in net financial assets, and cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally-accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Consolidated Financial Statements section of this report. We are independent of the District in accordance with the ethical requirements that are relevant to our audit of the consolidated financial statements in Canada and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the District's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the District or to cease operations, or has no realistic alternative but to do so.



District of Squamish Consolidated Statement of Financial Position

	2019	2018
December 31		
Financial Assets		
Cash and cash equivalents (Note #3)	76,289,831	87,602,342
Investments (Note #4)	15,373,118	247,065
Accounts receivable (Note #5)	3,675,096	4,792,631
Debt (Note #9)	4,195,700	3,087,345
Debt (Note #9)	1,244,500	1,148,300
Liabilities		
Accounts payable, accrued and other liabilities (Note #7)	15,334,738	16,802,247
Deferred revenue (Note #8)	24,408,312	23,525,878
Debt (Note #9)	23,873,602	24,114,987
Provision for solid waste landfill (Note #10)	4,195,700	3,087,345
Provision for post-employment benefits (Note #11)	1,244,500	1,148,300
Net Financial Assets	69,056,852	68,678,757
Non-Financial Assets		
Tangible capital assets (Schedules 1 and 2)	270,818,973	253,534,660
Inventories	147,739	155,047
Prepaid expenses	226,509	274,764
Accumulated Surplus (Note #12)	271,193,221	253,964,472
Commitment and contingencies (Note #13)	298,011,020	278,431,639


 Linda Klassen, CPA, CMA
 Acting Chief Financial Officer


 Karlen Elliott
 Mayor of Squamish



For the year end December 31

Revenue (Schedule 3)

- Taxation (Note #15)
- Other property levies (Note #15)
- Utility user fees (Note #15)
- Other revenue from own operations
- Other fees and charges
- Government transfers for capital projects
- Investment income

Expenses (Schedule 3)

- General Government
- Protective Services
- Transportation & Transit
- Economic & Community Development
- Parks, Recreation & Culture
- Health, Social & Housing
- Solid Waste Management
- Water Services
- Waste Water Services

Annual surplus before Other

Other

- Government transfers for capital projects
- Developer cost charge
- Developer contributed assets
- Gain (Loss) on disposal of assets
- Capital Connections
- Other Capital revenues

Annual Surplus

Accumulated Surplus, beginning of year

District of Squamish

Consolidated Statement of Change in Net Financial Assets

For the year end December 31

Financial Plan	2019	2018
	(Note #14)	
	\$ 19,112,807	\$ 15,774,340
Annual surplus	19,579,381	15,774,340
Acquisition of tangible capital assets	(41,788,444)	(17,557,470)
Contributed tangible capital assets	-	(3,390,070)
Amortization expense	5,945,272	6,829,876
Loss (Gain) on disposal of tangible capital assets	-	(72,770)
Proceeds on sale of tangible capital assets	-	118,532
	(35,843,172)	(14,071,902)
Other non-financial assets		
Decrease (increase) in inventory	-	41,031
Decrease (increase) in prepaid expenses	-	(78,152)
	7,308	(37,121)
	48,256	1,665,316
Change in net financial assets	55,563	(37,121)
Net financial assets, beginning of year	2,350,632	1,665,316
Net financial assets, end of year	24,467,167	22,801,851
	7,736,802	24,467,167

For the year end December 31

Cash provided by (used in)

Operating transactions

Annual surplus	
Non-cash items included in	
Amortization	
Contributed tangible c	
Loss (Gain) on disposa	
Provision for post emp	
Development cost cha	
Other deferred revenu	
Earnings on debt sinkin	
Provision for landfill cl	
Changes in other non-cash	

Investing transactions

Change in investments	
-----------------------	--

Capital transactions

Acquisition of tangible cap	
Proceeds from sale of tangl	

Financing transactions

Development cost levies re	
Proceeds of short-term deb	
Proceeds of long-term deb	
Lease principal repaid	
Debt principal repaid	

(Decrease) Increase in cash

Cash and cash equivalents, be

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2019

The Notes to the Consolidated Financial Statements are an integral part of the financial statements. The following explains the significant accounting policies and reporting principles underlying these statements. The Notes also provide relevant supplementary information and explanations.

1. Status of The District of Squamish

The District of Squamish (the "District") is a municipality that was incorporated on December 15, 1964 pursuant to the Municipal Act, and subsequently continued under the Local Government Act, a statute of the Legislature of the Province of British Columbia (the "Province"). The District is subject to the provisions of the Community Charter and legislation under the Province. The District's principal activity is providing property tax funded services such as general government, protective (police and fire), transportation, economic and community development, and parks and recreation. The District provides public utilities for solid waste, water and sanitary services. The District also operates a cemetery and an aquatic centre (facility is owned and governed by the Squamish-Lillooet Regional District) and provides funding to subsidiaries to provide the community with library and other services.

2. Significant accounting policies

The consolidated financial statements have been prepared by management in accordance with Canadian public sector accounting standards ("PSAS"). The significant accounting policies are summarized below:

Basis of consolidation

The consolidated financial statements include the assets, liabilities, reserves, surpluses/deficits, revenues and expenses of those District funds and government functions or entities which have been determined to comprise a part of the aggregate District operations based upon control exercised by the District. Inter-fund and inter-corporate balances and transactions have been eliminated.

I) Consolidated entities

The organizations (referred to as subsidiaries or civic corporations) included in the consolidated financial statements are as follows:

Squamish Public Library ("SPL"), which was incorporated without share capital as a municipal library of the District on May 15, 2003.

Squamish Sustainability Corporation ("SSC"), which was incorporated with the District as the sole shareholder on October 13, 2005.

II) Squamish District Community Pool

The Squamish-Lillooet Regional District ("SLRD") has contracted with the District to provide aquatic centre ("Squamish District Community Pool") recreational services. The District provides the programs and services at the Squamish District Community Pool on behalf of the SLRD. This facility was established and constructed under authority of the SLRD Service Area Establishment Bylaw No. 438. The related assets, liabilities, revenues and expenses are reported in the SLRD financial statements, as the taxing authority and owner of the facility. Therefore, the District does not include any portion of the Squamish District Community Pool financial position or operations in the consolidated financial statements.

District of Squamish

I) Fund accounting

As a local government, the District uses fund accounting for financial reporting purposes in accordance with the Municipal Act and Sanitary sewer.

II) Segment disclosure

The District also segregates its operations into segments of distinguishable activity or groups of activities. The District provides the following information:

Cash equivalents

Cash equivalents consist of deposits held in bank accounts to known amounts of cash.

Investments

The District's investments are held in the form of SLRD and are not included in the consolidated financial statements.

The District consolidates SSC's interest in the District. The interest is not determinable.

Deferred revenue

Government transfers, contribution grants and other income may only be used in the construction of tangible capital assets. In addition, the District collects for which the related services are provided (such as development costs).

Debt

Debt is recorded at cost net of principal payments.

Contaminated sites

Governmental environmental standard exists, and economic benefits will be given up for the environmental standard.

Management has assessed its potential liability for environmental responsibility. There are no such sites identified at this time, therefore no liability has been recorded.

Solid waste landfill

The obligation of closure and post-closure costs are reported in the future expenses.

Employee future benefits

District of Squamish

3. Cash and cash equivalents

	2019	2018
Cash	\$ 47,843,494	\$ 5,367,641
Cash equivalents	28,327,174	82,104,828
Cash held by civic corporations	119,163	129,873
	\$ 76,289,831	\$ 87,602,342

The District's Operating Account, presented as "Cash" is comprised of deposits at the Bank of Nova Scotia ("BNS") and accrues interest at a rate of BNS Prime Rate + 0.46% (2018 -BNS Prime Rate + 0.46%).

Cash equivalents are comprised of BNS "Notice Plan" deposits which accrue interest at a rate of 2.46% (2018 - 2.46%) and requires 30 days notice to liquidate.

4. Investments

	2019	2018
Term Deposits	15,109,698	-
Investments held by civic corporations	263,420	247,066
	\$ 15,373,118	\$ 247,066

Investments are comprised of cashable term deposits with maturity dates between September 2021 and September 2022, and earning interest between 2.35% and 2.58%.

5. Accounts receivable

	2019	2018
Property taxes	\$ 1,218,163	\$ 1,550,526
Government transfers	383,233	1,293,506
Utilities	707,914	762,233
GST	642,744	464,727
Trade accounts and other	729,406	726,553
Allowance for doubtful accounts	(6,364)	(4,915)
	\$ 3,675,096	\$ 4,792,630

The District receives government transfers from senior levels of government, including the Province of British Columbia and the Federal Government of Canada.

The District, as a local government, receives goods and services tax (GST) rebates and claims from the Canada Revenue Agency, Government of Canada.

District of Squamish

6. Debenture deposits

The District's debenture deposits are:

General
Solid waste
Water
Sewer

The District issues its debt instrument MFA; these are considered District return net of expenses. They are reflected in the Statement of Financial Position.

7. Accounts payable, accrued and other liabilities

Accrued liabilities
Trade accounts payable
Accrued interest payable
Other liabilities

8. Deferred revenue

Development cost levies, beginning
Contributions
Interest earned
less: Expenditures
Development cost levies, end of year
Other deferred revenue

Deferred revenue are short-term in nature and development cost levies are funds restricted funds in accounts (general fund).

District of Squamish

District of Squamish

9. Debt

The District's debt segregated by fund and other:

	2019	2018
General	\$ 13,108,320	\$ 14,126,892
Solid waste	1,846,245	312,946
Water	4,017,968	4,449,161
Sewer	2,838,700	3,163,618
Other	2,062,370	2,062,370
	\$ 23,873,602	\$ 24,114,987

2029

Water

2020

2027

2032

2029

2032

2031

2028

2023

2029

2029

2029

2030

2022

2032

Sewer

2024

2028

2032

2033

2029

2029

2030

2022

Other

temporary

temporary

temporary

Debt includes actuarial additions, w
in 2019 (2018 - \$8,015,064).

Debt (sinking fund contributions on

Other debt consists of District borrowing that may be considered short-term and debt held by civic corporations.

The District's debt by specific by-law:

Fund	Maturity year	Purpose	By-law	2019	2018
General					
	2020	Capital leases	n/a	\$ 15,450	\$ 46,568
	2022	Police building	1679	1,070,750	1,394,228
	2026	Forestry building	1917	1,224,535	1,373,609
	2027	Business Park	1945	1,562,638	1,725,705
	2029	Business Park	2029	1,730,760	1,869,372
	2031	Arena Roof	2064	490,257	521,630
	2031	Roads & Drainage	2051	768,737	817,931
	2022	Facilities	2137	184,921	241,881
	2027	General Capital Works	2166	823,095	908,988
	2023	General Capital Works	2166	198,286	243,184
	2023	Facilities	2137	53,447	65,549
	2033	General Capital Works	2208	359,849	378,765
	2023	General Capital Works	2208	191,089	234,358
	2023	Parks Capital Works	2214	81,031	99,379
	2031	Dike Construction and rehabilitation	2051	286,907	300,685
	2029	Flood Protection	2166	82,218	88,803
	2024	Systems & equipment	2208	62,165	73,201
	2029	Bridge, Flood Protection, Arena Lighting	2208	607,974	656,665
	2029	Bridge	2282	252,994	273,255
	2035	General Capital Works	2051	86,170	90,140
	2030	General Capital Works	2331	42,890	46,044
	2030	General Capital Works	2282	523,176	561,640
	2031	General Capital Works	2051	467,440	499,418
	2022	General Capital Works	2208	166,825	219,225
	2032	General Capital Works	2282	566,367	601,575
	2027	General Capital Works	2392	146,808	162,836

District of Squamish

10. Provision for solid waste landfill

The District has ongoing assessments and work performed to determine the timeframe and costs of closure and post closure costs associated with the landfill. The estimates are based on District Engineering reports and calculations performed by consultants.

The liability is calculated based on the ratio of cumulative usage to total capacity of the site by volume and the discounted estimated future cash flows associated with closure and post closure activities. An estimate for inflation is incorporated into the calculation. Cash flows are discounted at 3.74% (2018 - 3.94%) per annum and inflation is estimated at 3.27% (2018 - 1.48%) per annum.

The reported liability is based on estimates and assumptions with respect to capacity, usage and events extending over the remaining life of the landfill.

In 2019, the District completed the vertical expansion of the landfill, increasing its capacity and extending its estimated closure date.

As of December 31, 2019, the total capacity of the landfill after the expansion is estimated at 835,010 cubic meters. Assuming this total capacity, the current remaining capacity of the landfill site is estimated at 155,356 cubic meters (2018 – 179,000 cubic meters) which is 18.6% (2018 – 21.4%) of the site's total planned capacity after the expansion.

The total discounted future cash flows for closure and post closure costs are estimated at \$4,195,700 as at December 31, 2019 (2018 - \$3,087,345). The landfill is expected to reach capacity by 2027.

11. Provision for post-employment benefits

Information regarding the District's obligations for post-employment benefits is as follows:

	2019	2018
Liability, beginning of year	\$ 1,148,300	\$ 1,018,300
Current service cost	99,400	100,800
Interest cost	36,500	33,000
Benefits paid	-	-
Past service cost	(35,000)	(9,600)
Amortization of net actuarial (gain) / loss	(4,700)	5,800
Liability, end of year	\$ 1,244,500	\$ 1,148,300

The District provides future benefits to all of its eligible employees through a Sick Leave Plan, a Full Annual Vacation at Retirement Plan, and a Retirement Pay Plan (collectively as the "Plans"). The Sick Leave Plan entitles employees to twelve sick days per year, based on one day for each month of service, up to a maximum of 150 days. Sick leave benefits can be used by the employee at any point up to their retirement date.

The Full Annual Vacation at Retirement Plan entitles employees to receive full annual vacation or vacation pay on retirement irrespective of the month of retirement. This benefit would be paid out in full to the employee upon their retirement. The Retirement Pay Plan entitles an employee to two days pay at the employee's normal rate of pay for each year or part of year worked. The benefit would be paid out in full to the employee upon their retirement.

There were no amendments to the above Plans during the year ended December 31, 2019. The total expense recorded in the financial

District of Squamish

11. Provision for post-employment

The most recent actuarial valuation assumptions adopted in m

Discount rates
Expected future inflation
Expected wage and salary

12. Accumulated surplus

Unappropriated surplus
Appropriated surplus
Non-statutory reserves
Statutory reserves

Investment in tangible capital asset

The unappropriated surplus is the a
It is available to temporarily finance
emergency expenditures and, if incl

Appropriated surplus is the amount
aside by decision of Council for a sp
Community Charter and their use is
future services or capital works for v

Investment in tangible capital asset
of operations, the tangible capital a

District of Squamish

13. Commitments and contingencies

(a) Litigation

The District is currently involved in certain legal actions and other existing conditions involving uncertainty. Financial implications of potential claims against the District, resulting from such litigation, and that are not covered by insurance, are accrued to the extent that amounts can be reasonably estimated. Otherwise, such claims are to be recognized in the year in which an obligation is determined.

As at December 31, 2019, there were legal claims in various stages of litigation for which management is unable to determine the outcome. The outstanding claims are not expected to result in a material loss to the District. As such, no provision has been made in the financial statements for these claims. Losses, if any, resulting from these actions will be recorded in the period the loss becomes known and the amounts are determinable.

(b) Pension liability

The District and its employees contribute to the Municipal Pension Plan (a jointly trustee pension plan). The board of trustees, representing Plan members and employers, is responsible for administering the Plan, including investment of assets and administration of benefits. The Plan is a multi-employer defined benefit pension plan. Basic pension benefits are based on a formula. As at December 31, 2019, the Plan has about 197,000 active members and approximately 95,000 retired members. Active members include approximately 39,000 contributors from local governments.

Every three years an actuarial valuation is performed to assess the financial position of the Plan and the adequacy of Plan funding. The actuary determines an appropriate combined employer and member contribution rate to fund the Plan. The actuary's calculated contribution rate is based on the entry-age normal cost method, which produces the long term rate of member and employer contributions sufficient to provide benefits for average future entrants to the Plan. This rate may be adjusted for the amortization of any actuarial funding surplus and will be adjusted for the amortization of any unfunded actuarial liability.

The most recent actuarial valuation for the Municipal Pension Plan as at December 31, 2018, indicated a \$2,866 million funding surplus for basic pension benefits on a going concern basis.

Employers participating in the Plan record their pension expense as the amount of employer contributions made during the fiscal year (defined contribution pension plan accounting). This is because the Plan records accrued liabilities and accrued assets for the Plan in aggregate with the result that there is no consistent and reliable basis for allocating the obligation, assets and cost to the individual employers participating in the Plan.

In 2019, the District paid \$1,389,743 (2018 - \$1,234,019) for employer contributions and employees contributed \$1,208,501 (2018 - \$1,093,741) to the Plan.

The next valuation will be as at December 31, 2021 with results available in 2022.

Employers participating in the Plan record their pension expense as the amount of employer contributions made during the fiscal year (defined contribution pension plan accounting). This is because the Plan records accrued liabilities and accrued assets for the Plan in aggregate resulting in no consistent and reliable basis for allocating the obligation, assets and cost to the individual employers participating in the Plan.

(c) Demand notes

District of Squamish

(d) Squamish Oceanfront front end

As permitted under the Local Government Act, the District entered into Municipal Share Agreements in 2011 to Matthews Southwest and Bethel. The Agreements provide for the re Developer pays for and builds on behalf of the District. The District reimbursement paid by the District collections received by the District at the end of the 20 year term are forgiven.

Only projects identified in the Municipal Share Agreements and only at the time of project completion. Developer is not bound to proceed with the project.

14. Financial Plan

For 2019, the Financial Plan amount is \$2,866 million. The Financial Plan bylaw 2673 in the District provides for transfers from reserves and internal funds to fund the Financial Plan. The Financial Plan includes civic corporations.

The District's Financial Plan does not include the District's Financial Plan reconciles the District's Financial Plan

Revenues

Departmental revenues

Expenses

Departmental expenses

Annual surplus before Other

Other

Annual Surplus (Deficit)

District of Squamish

15. Taxation and utility revenues

Collection for District

The following shows the collections in 2019 for District purposes, including applicable civic corporations:

	Financial Plan	2019	2018
Taxation			
General property levies	\$ 29,436,527	\$ 29,407,254	\$ 27,605,650
Business improvement area	91,537	91,536	91,428
Water frontage levies	-	-	253,242
Sewer frontage levies	-	-	306,000
	29,528,064	29,498,790	28,256,320
Other property levies			
Grants-in-lieu of property levies	725,071	759,354	718,426
Hotel tax	-	536,396	332,325
1% utility revenue	294,830	293,435	276,670
Penalties and interest on property levies	300,000	307,088	287,798
	1,319,901	1,896,273	1,615,219
	30,847,965	31,395,063	29,871,539
Utility user fees			
Water	4,631,820	4,793,620	4,199,744
Sanitary sewer	5,964,205	6,315,078	5,695,749
Solid waste	4,007,500	4,496,146	4,214,676
	14,603,525	15,604,844	14,110,169
	\$ 45,451,490	\$ 46,999,907	\$ 43,981,708

Collection for other agencies

The following amounts were collected on behalf of other taxing authorities, and are not included on the District's Consolidated Statement of Operations:

	2019	2018
Province of BC School Taxes	\$ 12,600,081	\$ 11,542,830
BC Assessment Authority	396,492	370,447
Municipal Finance Authority	1,846	1,610
Squamish Lillooet Regional District	1,735,219	1,641,719
Sea to Sky Regional Hospital District	283,397	288,793
	\$ 15,017,035	\$ 13,845,399

District of Squamish

16. Government transfers and other

Operating

Federal
Provincial
Other

Total operating

Capital

Federal
Provincial
Other

Total capital

17. Trusts

The District trust funds account for accordance with PSAS, trust funds a

The District operates the Mount Ga Services Act. The following trust fu

Cemetery Care Fund financial posit

Financial Assets

Investments

Liabilities

Cemetery care fund

District of Squamish

18. Segmented information

The District is a diversified municipal government that provides a wide range of services to its citizens, including General Government; Protective Services; Transportation and Transit; Economic and Community Development; Recreation, Parks, Trails and Library; Public Health; Water, Sanitary Sewer and Solid Waste Utilities. For management reporting purposes, the District's operations and activities are organized and reported by Fund. Funds were created for the purpose of recording specific activities to attain certain objectives in accordance with special regulations, restrictions or limitations.

Municipal services are provided by departments and their activities reported within these funds. Certain functions that have been separately disclosed in the segmented information, along with the services they provide, are as follows:

General Government

General government and fiscal services is comprised of Council and the related support services provided by the Administration and Finance departments, as well as all operations and maintenance costs relating to Municipal Hall and grants to community organizations.

Protective Services

Protective Services is comprised of police, fire, emergency management planning, bylaw enforcement, animal control and building inspection.

Transportation and Transit

Transportation and Transit is a broad function comprised of engineering departments and the public works crews engaged in the maintenance and improvements to the road systems, drainage, sidewalks, flood protection, fleet maintenance, works yard maintenance and other planning and maintenance activities. In addition, this function includes transit services and airport operations.

Economic and Community Development

Economic and Community Development is comprised of planning and land use development, environmental planning, economic development and events management with the common goal of developing Squamish into a healthy, vibrant and economically viable community. In addition, the District's civic corporations and Squamish Sustainability Corporation, have been consolidated into this function for reporting purposes.

Recreation, Parks, Trails and Library

Recreation, Parks, Trails and Library is comprised of the arena and community centre, seniors centre, youth centre and an extensive networks of parks and trail systems throughout the community. In addition, the District's civic corporation, the Squamish Public Library, has been consolidated into this function for reporting purposes.

Public Health

Public Health Service is comprised of the municipal cemetery services.

Water and Sanitary Sewer Utilities

The Water and Sanitary sewer utilities are comprised of the water and sanitary sewer system networks, storm mains and pump stations.

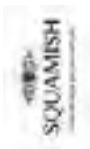
Solid Waste Utility

The Solid Waste Utility is comprised of garbage, recycling, organic waste collection services as well as the operation of the landfill.

District of Squamish

20. Subsequent Event

Subsequent to December 31, 2019, Organization and its impact on the on the District is not known. The di and the related financial impact on



District of Squamish
Schedule 1 - Tangible Capital Assets

For the year end December 31 2019		District of Squamish										2019	
COST		Land	Land Improvements	Buildings	Furniture, Vehicles and Equipment	Transportation Infrastructure	Solid Waste Infrastructure	Water Infrastructure	Sewer Infrastructure	Assets under Construction	Actual	Actual	
Opening Balance	\$ 60,498,903	\$ 29,292,522	\$ 41,764,620	\$ 16,507,257	\$ 89,297,206	\$ 5,424,146	\$ 56,682,093	\$ 57,337,933	\$ 12,667,598	\$ 369,472,278			
Add: Additions	847,195	6,306,706	82,600	3,335,837	4,421,733	6,354,342	3,854,475	3,423,536	4,945,458	33,571,881			
Less: Disposals				(177,664)						(177,664)			
Add: Transfers		323,491	(90,600)	426,467	(232,891)		584,362	(1,010,829)	(8,146,864)	(8,146,864)			
Less: Writedowns		9,613		(309,083)	(692,094)		(125,274)	255,998		(860,840)			
Closing Balance	<u>61,346,098</u>	<u>35,932,333</u>	<u>41,756,620</u>	<u>19,782,814</u>	<u>92,793,955</u>	<u>11,778,487</u>	<u>60,985,656</u>	<u>60,006,637</u>	<u>9,466,192</u>	<u>393,858,791</u>			
ACCUMULATED AMORTIZATION													
Opening Balance	-	8,556,084	18,938,259	8,923,606	37,031,109	1,693,394	18,967,797	21,827,368	-	115,937,617			
Add: Amortization			844,862	988,298	2,277,673	381,648	997,418	999,101		7,203,753			
Less: Acc Amortization on Disposals				(173,232)				(70,050)		(173,232)			
Add: Transfers			16,841	82,257	2,870		(12,207)	82,541		-			
Less: Writedowns				(82,645)			37,167			71,679			
Closing Balance	<u>-</u>	<u>9,277,679</u>	<u>19,798,026</u>	<u>9,666,027</u>	<u>39,311,652</u>	<u>2,075,042</u>	<u>20,002,382</u>	<u>22,909,009</u>	<u>-</u>	<u>123,039,818</u>			
Net Book Value, year ended 2019	\$ 61,346,098	\$ 26,654,654	\$ 21,958,593	\$ 10,116,787	\$ 53,482,303	\$ 9,703,445	\$ 40,983,274	\$ 37,097,627	\$ 9,466,192	\$ 270,818,973			

For the year end December 31 2018		Land
COST		
Opening Balance	\$ 59,923,355	
Add: Additions	575,546	
Less: Disposals and transfers		
Closing Balance	<u>60,498,903</u>	
ACCUMULATED AMORTIZATION		
Opening Balance		
Add: Amortization		
Less: Acc Amortization on Disposals		
Closing Balance		
Net Book Value, year ended 2018	\$ 60,498,903	



District of Squamish
Schedule 3 - Statement of Operations by Segment

	For the year end December 31										Reserve Fund Transactions		
	General Government	Protective Services	Transportation & Transit	Economic & Community Development	Parks Recreation & Culture	Health Social & Housing	Solid Waste Management	Water Services	Waste Water Services	FY 2019	FY 2018		
Revenue (Schedule 3)													
Taxation (Note #15)	\$ 29,498,790	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 29,498,790	\$ 28,256,320	
Other property levies (Note #15)	1,359,877	-	-	536,396	-	-	-	-	-	-	1,896,273	1,615,219	
Utility user fees (Note #15)	24,527	84,365	1,147,039	203,813	963,847	40,072	4,496,146	6,315,078	6,315,078	15,604,844	14,110,169	2,009,802	
Other revenue from own sources	458,141	1,288,069	93,008	785,989	163,144	16,018	261,712	550	-	3,062,125	3,161,938	3,161,938	
Other fees and charges	1,819,144	386,124	292,034	144,047	48,306	-	-	-	-	2,689,654	1,958,071	1,958,071	
Government transfers for operating (Note#16)	2,107,464	-	-	-	5,024	-	8,407	102,056	113,454	2,336,404	1,717,636	1,717,636	
Investment income	35,267,942	1,756,558	1,552,081	1,670,255	1,160,122	56,090	4,766,265	4,912,261	6,428,532	57,572,103	52,829,155	52,829,155	
Expense (Schedule 3)													
Payroll and benefits	5,221,713	3,511,857	3,473,315	1,461,028	4,085,416	42,864	82,474	773,624	672,561	19,324,852	17,352,225	17,352,225	
Operating Expenses	2,406,875	5,958,507	2,286,929	1,373,516	2,274,043	122,852	4,645,579	1,369,309	2,058,014	22,505,627	19,771,384	19,771,384	
Debt service - interest	346,805	-	71,869	174,646	6,971	-	24,764	206,858	149,729	1,076,383	1,096,630	1,096,630	
Amortization expense	4,711,617	-	-	11,102	102,868	-	361,648	997,418	999,100	7,203,754	6,829,576	6,829,576	
Annual surplus before Other	22,580,932	(7,806,558)	(4,310,031)	(1,350,037)	(5,289,175)	(109,626)	(368,201)	1,585,052	2,549,128	7,461,477	7,777,041	7,777,041	
Other													
Government transfers for capital (Note #16)	-	-	3,642,534	-	220,450	-	-	-	-	3,862,984	947,138	947,138	
Developer cost charge capital revenues	-	-	638,286	-	289,912	-	-	1,091,906	642,516	2,672,620	2,470,824	2,470,824	
Developer contributed assets	3,354,194	45	3,486	528,240	-	-	-	1,782,210	680,755	6,346,931	4,460,983	4,460,983	
Gain on disposal of tangible capital assets	(919,789)	-	-	-	(4,432)	-	-	-	-	(924,201)	72,770	72,770	
Capital Connections	-	-	-	-	-	-	-	103,586	15,935	119,521	46,163	46,163	
Other Capital revenues	-	-	38,049	-	-	-	-	-	-	38,049	-	-	
Annual Surplus	2,434,425	45	4,322,355	528,240	515,931	-	-	2,977,703	1,339,206	12,117,904	7,997,299	7,997,299	
Annual Surplus	25,015,357	(7,806,513)	12,323	(821,797)	(4,773,245)	(109,626)	(368,201)	4,542,754	3,888,334	19,579,381	15,774,340	15,774,340	

Sinking Fund Surplus - General
Sinking Fund Surplus - Water
Sinking Fund Surplus - Sewer
Land Sale - BL720
Equipment Replacement
Community Works Fund
Capital Rehab - General
Capital Rehab - Water
Capital Rehab - Sewer
Capital Rehab - Solid Waste
Offstreet Parking
Affordable Housing - BL1951
Carbon Neutral - BL2079
Vanoc Legacy - BL2101
Parkland in Lieu
Corridor Trail MOU
Environmental Reserve Fund BL 2640

AUDITED FINANCIAL STATEMENTS

District of Squamish
Consolidated Financial Statements
For the year ended December 31, 2020



District of Squamish

December 31, 2020

Management's Responsibility for Financial Reporting

The Council of the District of Squamish (the "District") has delegated the responsibility for the integrity and objectivity of the financial information contained in the consolidated financial statements to the management of the District. The consolidated financial statements which, in part, are based on informed judgements and estimates, have been prepared by management in accordance with Canadian public sector accounting standards, which have been applied on a basis consistent with that of the preceding year.

To assist in carrying out their responsibility, management maintains an accounting system and internal controls to provide reasonable assurance that transactions are executed and recorded in accordance with authorization, and that financial records are reliable for preparation of financial statements.

The Mayor and Council oversee management's responsibilities for the financial reporting and internal control systems. Council annually reviews and approves the consolidated financial statements.

The District's independent auditors, BDO Canada LLP, are engaged to express an opinion as to whether these consolidated financial statements present fairly the District's consolidated financial position, operations and cash flows in accordance with Canadian public sector accounting standards. Their opinion is based on procedures they consider sufficient to support such an opinion in accordance with Canadian generally accepted auditing standards.

The consolidated financial statements have, in management's opinion, been properly prepared within reasonable limits of materiality and in accordance with Canadian public sector accounting standards.



Heather Boxrud, MBA, CPA, CGA
Chief Financial Officer
May 4, 2021



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Fax: 604 932 3764
whistler@bdo.ca
www.bdo.ca

BDO Canada LLP
1200 Alpha Lake Road
Suite 202
Whistler BC V8E 0H6

Independent Auditor's Report

To the Mayor and Councillors of the District of Squamish

We have audited the accompanying consolidated financial statements of the District of Squamish and its controlled entities (the "District"), which comprise the Consolidated Statement of Financial Position as at December 31, 2020, the Consolidated Statements of Change in Net Financial Assets, Operations, and Cash Flows for the year then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the District as at December 31, 2020, and the results of its operations, change in net financial assets, and cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally-accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Consolidated Financial Statements section of this report. We are independent of the District in accordance with the ethical requirements that are relevant to our audit of the consolidated financial statements in Canada and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the District's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the District or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the District's financial reporting process.

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.



Auditor's Responsibilities for the Audit of the Consolidated Financial Statements (Continued)

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the District's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the District to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the District to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

BDO Canada LLP

Chartered Professional Accountants

Whistler, British Columbia
May 4, 2021



District of Squamish
Consolidated Statement of Financial Position

December 31	2020	2019
Financial Assets		
Cash and cash equivalents (Note #3)	\$ 96,838,000	\$ 76,289,831
Investments (Note #4)	15,518,071	15,373,118
Accounts receivable (Note #5)	4,859,624	3,675,096
Debenture deposits (Note #6)	664,756	536,606
	<u>117,880,451</u>	<u>95,874,651</u>
Liabilities		
Accounts payable, accrued and other liabilities (Note #7)	20,066,100	15,334,738
Deferred revenue (Note #8)	25,900,125	24,408,312
Debt (Note #9)	33,268,668	23,873,602
Provision for solid waste landfill (Note #10)	4,482,724	4,195,700
Provision for post-employment benefits (Note #11)	1,452,300	1,244,500
	<u>85,169,917</u>	<u>69,056,852</u>
Net Financial Assets	<u>32,710,534</u>	<u>26,817,799</u>
Non-Financial Assets		
Tangible capital assets (Schedules 1 and 2)	314,611,308	270,818,973
Inventories	109,160	147,739
Prepaid expenses	237,503	226,509
	<u>314,957,971</u>	<u>271,193,221</u>
Accumulated Surplus (Note #12)	<u>\$ 347,668,505</u>	<u>\$ 298,011,020</u>
Commitments and contingencies (Note #13)		

Heather Boxrud, MBA, CPA, CGA
Chief Financial Officer

Karen Elliott
Mayor of Squamish



**District of Squamish
Consolidated Statement of Operations**

Financial Plan

For the year end December 31	2020 (Note #14)	2020	2019
Revenue (Schedule 3)			
Taxation (Note #15)	\$ 30,981,070	\$ 30,153,046	\$ 29,498,790
Other property levies (Note #15)	1,319,930	1,584,842	1,896,273
Utility user fees (Note #15)	15,746,100	16,511,027	15,604,844
Other revenue from own sources	2,342,207	1,368,882	2,464,014
Other fees and charges	3,227,933	3,850,634	3,082,125
Government transfers for operating (Note #16)	2,152,000	5,432,633	2,689,654
Investment income	1,463,429	1,797,361	2,336,400
	57,232,669	60,698,425	57,572,100
Expenses (Schedule 3)			
General Government	14,131,520	13,679,381	12,687,010
Protective Services	10,156,380	10,145,546	9,565,115
Transportation & Transit	6,706,522	5,748,636	5,842,112
Economic & Community Development	2,985,671	3,204,389	3,020,292
Parks, Recreation & Culture	5,938,955	5,727,790	6,469,297
Health, Social & Housing	199,800	128,349	165,716
Solid Waste Management	5,559,739	5,567,653	5,134,466
Water Services	3,777,031	3,503,710	3,347,208
Waste Water Services	4,531,020	4,339,751	3,879,404
	53,986,638	52,045,205	50,110,620
Annual surplus before other	3,246,031	8,653,220	7,461,480
Other (Schedule 3)			
Government transfers for capital (Note #16)	9,916,000	317,732	3,862,984
Developer cost charge capital revenues	4,841,500	596,148	2,672,620
Developer contributed assets	70,000	39,116,791	6,348,931
Gain (Loss) on disposal of tangible capital assets	-	549,235	(924,201)
Capital Connections	125,000	74,609	119,521
Other Capital revenues	-	349,750	38,049
	14,952,500	41,004,265	12,117,904
Annual Surplus	18,198,531	49,657,485	19,579,384
Accumulated Surplus, beginning of year	298,011,020	298,011,020	278,431,636
Accumulated Surplus, end of year	\$ 316,209,551	\$ 347,668,505	\$ 298,011,020



District of Squamish
Consolidated Statement of Change in Net Financial Assets

For the year end December 31	Financial Plan		
	2020	2020	2019
	(Note #14)		
Annual surplus	\$ 18,198,531	\$ 49,657,485	\$ 19,579,384
Acquisition of tangible capital assets	(45,631,700)	(14,212,832)	(19,644,332)
Contributed tangible capital assets	-	(38,671,263)	(5,780,646)
Amortization expense	6,910,000	9,086,011	7,203,754
(Gain) Loss on disposal of tangible capital assets	-	(549,235)	924,201
Proceeds on sale of tangible capital assets	-	554,984	12,710
	(38,721,700)	(43,792,335)	(17,284,313)
Other non-financial assets			
Decrease in inventory	-	38,579	7,308
(Increase) Decrease in prepaid expenses	-	(10,994)	48,256
	-	27,585	55,564
Change in net financial assets	(20,523,169)	5,892,735	2,350,635
Net financial assets, beginning of year	26,817,799	26,817,799	24,467,164
Net financial assets, end of year	\$ 6,294,630	\$ 32,710,534	\$ 26,817,799



**District of Squamish
Consolidated Statement of Cash Flows**

For the year end December 31	2020	2019
Cash provided by (used in)		
Operating transactions		
Annual surplus	\$ 49,657,485	\$ 19,579,384
Non-cash items included in annual surplus		
Amortization	9,086,011	7,203,754
Contributed tangible capital assets	(38,671,263)	(5,780,646)
(Gain) Loss on disposal of tangible capital assets	(549,235)	924,201
Provision for post employment benefit	207,800	96,200
Development cost charge revenue recognized	(596,148)	(2,672,620)
Other deferred revenue recognized	(289,693)	124,078
Earnings on debt sinking funds (actuarial adjustment)	(740,877)	(647,091)
Provision for landfill closure	287,025	1,108,355
Changes in other non-cash working capital	3,446,267	(327,132)
	21,837,372	19,608,483
Investing transactions		
Increase in investments	(144,952)	(15,126,053)
	(144,952)	(15,126,053)
Capital transactions		
Acquisition of tangible capital assets	(14,212,832)	(19,644,332)
Proceeds from sale of tangible capital assets	554,984	12,710
	(13,657,848)	(19,631,622)
Financing transactions		
Development cost levies received, including interest	2,377,653	3,430,976
Proceeds of long-term debt	13,943,927	2,090,699
Capital leases	90,636	(31,116)
Short-term loans	(2,062,370)	-
Debt principal repaid	(1,836,249)	(1,653,877)
	12,513,597	3,836,682
Increase (Decrease) in cash	20,548,169	(11,312,510)
Cash and cash equivalents, beginning of year	76,289,831	87,602,341
Cash and cash equivalents, end of year	\$ 96,838,000	\$ 76,289,831
Supplemental information:		
Interest paid	\$ 1,070,577	\$ 1,076,393

Notes to the Consolidated Financial Statements

December 31, 2020

The Notes to the Consolidated Financial Statements are an integral part of the financial statements. The following explains the significant accounting policies and reporting principles underlying these statements. The Notes also provide relevant supplementary information and explanations.

1. Status of The District of Squamish

The District of Squamish (the "District") is a municipality that was incorporated on December 15, 1964 pursuant to the Municipal Act and subsequently continued under the Local Government Act, a statute of the Legislature of the Province of British Columbia (the "Province"). The District is subject to the provisions of the Community Charter and legislation under the Province. The District's principal activity is providing property tax funded services such as general government, protective (police and fire), transportation, economic and community development, and parks and recreation. The District provides public utilities for solid waste, water and sanitary services. The District also operates a cemetery and an aquatic centre (facility is owned and governed by the Squamish-Lillooet Regional District) and provides the community with library and other services.

2. Significant accounting policies

The consolidated financial statements have been prepared by management in accordance with Canadian public sector accounting standards ("PSAS"). The significant accounting policies are summarized below:

Basis of consolidation

The consolidated financial statements include the assets, liabilities, reserves, surpluses/deficits, revenues and expenses of those District funds and government functions or entities which have been determined to comprise a part of the aggregate District operations based upon control exercised by the District. Inter-fund and inter-corporate balances and transactions have been eliminated.

I) Consolidated entities

The organizations (referred to as subsidiaries or civic corporations) included in the consolidated financial statements are as follows:

Squamish Public Library ("SPL"), which was incorporated without share capital as a municipal library of the District on May 15, 2003.

Squamish Sustainability Corporation ("SSC"), which was incorporated with the District as the sole shareholder on October 13, 2005.

II) Squamish District Community Pool

The Squamish-Lillooet Regional District ("SLRD") has contracted with the District to provide aquatic centre ("Squamish District Community Pool") recreational services. The District provides the programs and services at the Squamish District Community Pool on behalf of the SLRD. This facility was established and constructed under authority of the SLRD Service Area Establishment Bylaw No. 438. The related assets, liabilities, revenues and expenses are reported in the SLRD financial statements, as the taxing authority and owner of the facility. Therefore, the District does not include any portion of the Squamish District Community Pool financial position or operations in the consolidated financial statements.

Basis of accounting

The consolidated financial statements are prepared using the accrual basis of accounting. The accrual basis of accounting records revenue as it is earned and measurable. Expenses are recognized as they are incurred and measurable based upon receipt of goods or services and / or the creation of a legal obligation to pay.

District of Squamish

Basis of accounting (continued)

I) Fund accounting

As a local government, the District uses fund accounting. The resources and operations of the District have been segregated for accounting and financial reporting purposes into the following funds, which are presented as supplementary information: General, Solid Waste, Water and Waste Water.

II) Segment disclosure

The District also segregates its operations for financial reporting based upon group of activities / services. A segment is defined as a distinguishable activity or group of activities / services of a government for which it is appropriate to separately report financial information. The District provides this additional segment information in Schedule 3.

Cash equivalents

Cash equivalents consist of deposits in Bank of Nova Scotia High Interest Plan . These investments are highly liquid and are readily convertible to known amounts of cash.

Investments

The District's investments are held in term deposits with an accredited Canadian Financial Institution. Funds held by the District for the SLRD are not included in the consolidated financial statements.

The District consolidates SSC's interest in a limited partnership. This investment is recorded at nominal value because the fair value of this interest is not determinable.

Deferred revenue

Government transfers, contributions and other amounts are received from third parties pursuant to legislation, regulation, or agreement. They may only be used in the conduct of certain programs, in the completion of specific work or for the acquisition and construction of tangible capital assets. In addition, certain user fees and development cost levies ("DCL") or development cost charges ("DCC") are collected for which the related services or capital costs have yet to be performed. Revenue is recognized in the period when the related expenses (such as development costs) are incurred, services performed or the tangible capital assets are acquired.

Debt

Debt is recorded at cost net of principal repayments and adjustments, in accordance with Municipal Finance Authority ("MFA").

Contaminated sites

Governments are required to accrue a liability for the costs to remediate a contaminated site. The District recognizes a liability when an environmental standard exists, contamination exceeds the standard, the government has responsibility for remediation, future economic benefits will be given up and a reasonable estimate can be made.

Management has assessed its potential liabilities, including sites that are no longer in productive use and sites for which the District has responsibility. There are no sites that have contamination in excess of an environmental standard which requires remediation at this time. Therefore, no liability has been recognized in these financial statements.

Solid waste landfill

The obligation of closure and post-closure costs associated with the solid waste landfill site is based on the present value of estimated future expenses.

Employee future benefits

The District and its employees make contributions to the Municipal Pension Plan ("MPP"). These District contributions are expensed as incurred.

For post-employment benefits, the District accrues for the employees' Sick Leave Plan, Full Annual Vacation at Retirement Plan, and the Retirement Pay Plan. The liabilities related to these benefits are actuarially determined based on period of service and best estimates of retirement ages and expected salaries. The liabilities under these benefit plans are accrued based on projected benefits as the employees render services necessary to earn the future benefits.

District of Squamish

Non-Financial assets

Non-financial assets are held for use in the provision of goods and services but are not available to discharge existing liabilities. These assets may have a useful life extending beyond the current year and are not intended for sale in the ordinary course of operations.

Intangible assets, such as water rights and mineral resources, are not recorded in the financial statements.

Tangible capital assets

Tangible capital assets are recorded at cost which includes amounts that are directly attributable to the acquisition, construction, development or betterment of the assets. The cost, less residual value, of the tangible capital assets (excluding land) is amortized on a straight-line basis over their estimated useful life as follows:

Fund	Asset Category	Useful Life Range (years)
General	Land	n/a
	Land improvements	5 to 200
	Buildings	5 to 60
	Furniture, vehicles, & equipment	3 to 40
	Transportation infrastructure	5 to 100
Solid Waste	Solid waste infrastructure	12 to 50
Water	Water infrastructure	5 to 100
Waste Water	Waste water infrastructure	5 to 100

Tangible capital assets, including assets under construction, are recorded at cost. Amortization is charged over the asset's useful life in a rational and systematic manner, considering cost less any residual value. Assets under construction are not amortized. When assets are substantially complete and available for use, they cease to be classified as assets under construction and their period of amortization begins.

Contributed tangible capital assets are recognized at fair value (using various methods including actual developer costs, appraisals, assessed values or professional estimations) at the date of contribution and are also recognized as revenue. Where an estimate of fair market value cannot be made, the tangible capital asset is recognized at nominal value.

Leases are classified as capital or operating leases. Leases which transfer substantially all of the benefits and risks incidental to ownership of property are accounted for as leased tangible capital assets. All other leases are accounted for as operating leases and the related lease payments are charged to expenses as incurred.

The District's tangible capital assets do not include works of art, historical artifacts/ treasures or natural environment assets.

Inventories

Inventories held for consumption are recorded at the lower of cost and replacement cost. Donated materials are initially recorded at their fair market value, if determinable, and subsequently at the lower of cost and replacement cost.

District of Squamish

Tax revenues

Taxes are levied to provide revenue to the District for the provision of public services. Tax revenues are recognized as revenue in the year they are levied as the tax revenues result from non-exchange transactions that are compulsorily paid to local governments in accordance with the established laws and regulations. The tax revenues include levies on behalf of consolidated entities, business improvement area(s) and utility frontage taxes.

The property tax revenue relies on market assessments of land value that are subject to appeal. Through the British Columbia Assessments appeal process, taxes may be adjusted by way of supplementary roll adjustments. Estimates are made of potential adjustments to taxes. Any additional adjustments required over those estimated are recognized at the time they are awarded.

The District is required by the Province and other taxing authorities to collect and remit levies in respect of properties. The District has no jurisdiction or control over these levies. Therefore, levies imposed by other taxing authorities are not reflected as a District revenue and expense. The funds collected are presented as a payable to the taxing authority.

Government transfers

Government transfers are transfers of monetary assets or tangible capital assets to or from the District that are not the result of an exchange transaction, a direct financial return, or expected to be repaid in the future. Government transfers, which include legislative grants, are recognized as revenue in the consolidated financial statements when the transfer is authorized and any eligibility criteria have been met, stipulations, if any, have been met and reasonable estimates of the amounts can be determined.

If stipulations give rise to an obligation that meets the definition of a liability, the resulting liability is deferred in the consolidated financial statements and recognized in the statement of operations as the stipulation liabilities are settled.

Other revenues

The District recognizes other revenue for the provision of utility and other public services. Sale of services and other revenue are recognized on an accrual basis.

The utility services include water, waste water and solid waste. The revenue for water, waste water and solid waste usage are recorded as user fees. Other utility revenues are recorded for servicing properties such as connection fees, which are recognized when the connection has been established.

Other sales of goods and services include revenue from other government services such as general government, transportation, economic and community development, parks and recreation and the consolidated civic corporations.

Estimates

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosures of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reported period. Actual results will depend on future economic events and could differ from those estimates. The significant areas requiring management estimates include provision for landfill closure and post closure costs, provision for post employment benefits, and the useful lives of tangible capital assets.

Contingent Liabilities

Liabilities for potential obligations that are contingent on future events are recognized when it is likely that the future event will confirm the existence of the obligation and the amount of the liability can be reasonably estimated. Disclosure for potential obligations that do not meet the threshold is made when the occurrence of the confirming future event is likely but the amount of the liability cannot be reasonably estimated, or the occurrence of the confirming future event is not determinable.

Financial plan

The 2020 financial plan is included on the consolidated statements of operations and accumulated surplus and change in net financial assets. The budget is compiled from the District Council approved operating budget, adjusted for consolidated entities (Note #14).

District of Squamish

3. Cash and cash equivalents

	2020	2019
Cash	\$ 93,575,131	\$ 47,843,494
Cash equivalents	3,164,983	28,327,174
Cash held by civic corporations	97,886	119,163
	\$ 96,838,000	\$ 76,289,831

The District's Operating Account, presented as "Cash" is comprised of deposits at the Bank of Nova Scotia ("BNS") and accrues interest at a rate of BNS Prime Rate + 0.046% (2019 - BNS Prime Rate + 0.46%)

Cash Equivalents are comprised of BNS "Notice Plan" deposits which accrue interest at a rate of 0.96% (2019 - 2.46%) and requires 20 days notice to liquidate.

4. Investments

	2020	2019
Term Deposits	\$ 15,239,414	\$ 15,109,698
Investments held by civic corporations	278,657	263,420
	\$ 15,518,071	\$ 15,373,118

Investments are comprised of cashable term deposit with maturity dates between September 2021 and September 2022 and earning interest between 1.06% and 2.56% (2019 - between 2.35% and 2.58%)

5. Accounts receivable

	2020	2019
Property taxes	\$ 1,863,738	\$ 1,218,163
Government transfers	333,774	383,233
Utilities	983,500	707,914
GST	499,836	642,744
Trade accounts and other	1,191,727	729,406
Allowance for doubtful accounts	(12,951)	(6,364)
	\$ 4,859,624	\$ 3,675,096

The District receives government transfers from senior levels of government, including the Province of British Columbia and the Federal Government of Canada.

The District, as a local government, receives goods and services tax (GST) rebates and claims from the Canada Revenue Agency, Government of Canada.

District of Squamish

6. Debenture deposits

The District's debenture deposits are reported by fund as follows:

	2020	2019
General	\$ 429,999	\$ 341,715
Solid waste	71,028	22,017
Water	81,339	92,145
Waste water	82,390	80,729
	\$ 664,756	\$ 536,606

The District issues its debt instruments through the MFA. A portion of the debenture proceeds is withheld in the debt reserve fund by the MFA; these are considered District cash deposits and are a condition of the borrowings. These deposits are invested by MFA and earn a return net of expenses. They are refundable upon maturity of the underlying debt.

7. Accounts payable, accrued and other liabilities

	2020	2019
Accrued liabilities and trade liabilities	\$ 14,434,569	\$ 9,670,739
Wages and benefits payable	1,357,069	1,014,644
Accrued interest payable	226,664	196,736
Other liabilities	4,047,798	4,452,619
	\$ 20,066,100	\$ 15,334,738

8. Deferred revenue

	2020	2019
Development cost levies, beginning of year	\$ 20,302,185	\$ 19,543,829
Contributions	2,062,557	2,787,826
Interest earned	370,831	643,150
Expenditures	(704,732)	(2,672,620)
Transfers	52,850	-
Development cost levies, end of year	22,083,691	20,302,185
Other deferred revenue	3,816,434	4,106,127
	\$ 25,900,125	\$ 24,408,312

Deferred revenue are short-term in nature, with the exception of the deferrals dedicated for developments and capital projects. The development cost levies are funds restricted by bylaw for the purpose which they were collected from developers. The District holds these restricted funds in accounts (general, water, waste water and solid waste) for the intended use of the funds.

District of Squamish

9. Debt

The District's debt by specific by-law:

Fund	Maturity year	Interest rate	Purpose	By-law	2020	2019
General						
	2025	n/a	Capital Leases	n/a	\$ 106,086	\$ 15,450
	2022	1.75	Police Building	1679	731,099	1,070,750
	2026	1.75	Forestry Building	1917	1,069,497	1,224,535
	2027	4.82	Business Park	1945	1,393,048	1,562,638
	2029	4.90	Business Park	2029	1,586,604	1,730,760
	2031	4.20	Arena Roof	2064	457,629	490,257
	2031	4.20	Roads & Drainage	2051	717,576	768,737
	2022	2.90	Facilities	2137	125,682	184,921
	2027	2.90	General Capital Works	2166	733,766	823,095
	2023	3.85	General Capital Works	2166	151,592	198,286
	2023	3.85	Facilities	2137	40,861	53,447
	2033	3.85	General Capital Works	2208	340,176	359,849
	2023	3.85	General Capital Works	2208	146,089	191,089
	2023	3.85	Parks Capital Works	2214	61,949	81,031
	2031	3.64	Dike Construction and Rehabilitation	2051	272,579	286,907
	2029	3.00	Flood Protection	2166	75,370	82,218
	2024	3.00	Systems & Equipment	2208	50,688	62,165
	2029	3.00	Bridge, Flood Protection, Arena Lighting	2208	557,336	607,974
	2029	3.00	Bridge	2282	231,922	252,994
	2035	2.75	General Capital Works	2051	82,061	86,170
	2030	2.75	General Capital Works	2331	39,627	42,890
	2030	2.75	General Capital Works	2282	483,367	523,176
	2031	2.10	General Capital Works	2051	434,504	467,440
	2022	1.95	General Capital Works	2208	112,852	166,825
	2032	3.15	General Capital Works	2282	530,102	566,367
	2027	3.15	General Capital Works	2392	130,298	146,808
	2033	3.20	General Capital Works	2530	286,738	304,563
	2023	2.90	General Capital Works	2534	191,709	251,926
	2029	2.24	General Capital Works	2533	460,995	505,051
	2025	0.91	General Capital Works	2331	681,887	-
	2030	0.91	General Capital Works	2392	1,702,738	-
	2030	0.91	General Capital Works	2444	1,262,626	-
	2030	0.91	General Capital Works	2600	1,071,717	-
	2030	0.91	General Capital Works	2687	358,986	-
	2035	0.91	General Capital Works	2536	777,763	-
	2035	0.91	General Capital Works	2599	580,808	-
	2040	0.91	General Capital Works	2465	1,650,300	-
					\$ 19,688,627	\$ 13,108,319

District of Squamish

9. Debt (continued)

Fund	Maturity year	Interest rate	Purpose	By-law	2020	2019
Solid Waste						
	2025	2.75	Landfill Capital Projects	2137	\$ 111,126	\$ 131,149
	2023	3.85	Landfill Capital Projects	2137	64,369	84,196
	2022	2.90	Landfill Capital Projects	2137	30,756	45,252
	2029	2.24	Landfill Capital Projects	2535	1,447,331	1,585,648
	2025	0.91	Landfill Vertical Expansion	2535	3,310,901	-
	2025	0.91	Landfill Vertical Expansion	2691	1,521,978	-
					\$ 6,486,461	\$ 1,846,245
Water						
	2020	6.45	Powerhouse Springs	1572	\$ -	\$ 80,393
	2027	4.82	Water Systems	1944	186,208	208,877
	2032	2.90	Water Systems	2167	218,442	232,421
	2029	4.90	Water Systems	2052	360,351	393,091
	2032	2.90	Water Systems	2138	176,663	187,968
	2031	4.20	Water Capital Works	2052	380,114	407,215
	2028	3.85	Water Capital Works	2209	515,676	569,489
	2023	3.85	Watermain Replacement	2167	105,999	138,649
	2029	3.00	PRV, Meters, Stations, Mains	2167	136,127	148,495
	2029	3.00	Watermain Replacement	2209	237,056	258,595
	2029	3.00	Water Capital Works	2283	599,416	653,879
	2030	2.75	Water Capital Works	2283	139,134	150,593
	2022	1.95	Water Capital Works	2209	93,608	138,377
	2032	3.15	Water Capital Works	2445	421,117	449,926
	2040	0.91	Water Capital Works	2393	701,382	-
	2035	0.91	Water Capital Works	2532	322,840	-
					\$ 4,594,133	\$ 4,017,968
Waste Water						
	2024	2.40	WWTP Mamquam	1756	\$ 836,536	\$ 1,021,381
	2028	4.65	Sewer Mains	1977	320,540	353,989
	2032	2.90	Trunk Sanitary Sewer Mains	2156	327,813	348,791
	2033	3.85	Sewer Capital Works	2168	140,095	148,197
	2029	3.00	Sanitary Sewer Trunk Line	2156	97,168	105,996
	2029	3.00	Centrifuge, Trunk, Lift Station, Crane	2211	181,487	197,977
	2030	2.75	Sewer Capital Works	2211	551,628	597,059
	2022	1.95	Sewer Capital Works	2211	44,180	65,310
					\$ 2,499,447	\$ 2,838,700
Other						
	temporary		Arena Slab Upgrade	2543	-	1,167,124
	temporary		Technology Project	2544	-	303,030
	temporary		Tantalus Firehall Upgrade	2545	-	592,216
					\$ -	\$ 2,062,370
					\$ 33,268,668	\$ 23,873,602

Debt includes actuarial additions, which represent projected earnings on the sinking fund deposits. The actuarial additions are \$7,982,649 in 2020 (2019 - \$7,634,943).

District of Squamish

9. Debt (continued)

Debt (sinking fund contributions on existing MFA loans) to be retired over the next five years, segregated by fund / other are as follows:

	2021	2022	2023	2024	2025	2026+	2026+ Post Actuarial
General	\$ 1,902,735	\$ 1,796,649	\$ 1,552,571	\$ 1,396,615	\$ 1,387,181	\$ 6,550,433	\$ 5,102,443
Solid Waste	1,115,787	1,115,787	1,104,770	1,089,098	1,089,098	553,267	418,654
Water	344,200	344,200	302,000	276,196	276,196	1,662,196	1,389,145
Waste Water	213,303	213,303	193,386	193,386	104,473	509,189	1,072,407
	\$ 3,576,025	\$ 3,469,939	\$ 3,152,727	\$ 2,955,295	\$ 2,856,948	\$ 9,275,085	\$ 7,982,649

Authorized but unissued debt is \$6,596,238 in 2020 (2019 - \$17,231,599)

10. Provision for solid waste landfill

The District has ongoing assessments and work performed to determine the timeframe and costs of closure and post closure costs associated with the landfill. The estimates are based on District engineering reports and calculations performed by engineering consultants.

The liability is calculated based on the ratio of cumulative usage to total capacity of the site by volume and the discounted estimated future cash flows associated with closure and post closure activities. An estimate for inflation is incorporated into the calculation. Cash flows are discounted at 2.76% (2019 - 3.74%) per annum and inflation is estimated at 2.76% (2019 - 3.27%) per annum.

The reported liability is based on estimates and assumptions with respect to capacity, usage and events extending over the remaining life of the landfill.

In 2019, the District completed the vertical expansion of the landfill, increasing its capacity and extending its estimated closure date.

As of December 31, 2020 the total capacity of the landfill after the expansion is estimated at 835,010 cubic meters. Assuming this total capacity, the current remaining capacity of the landfill site is estimated at 134,542 cubic meters (2019 – 155,356 cubic meters) which is 16.1% (2019 – 18.6%) of the site’s total planned capacity after the expansion.

The total discounted future cash flows for closure and post closure costs are estimated at \$4,482,724 as at December 31, 2020 (2019 - \$4,195,700). The landfill is expected to reach capacity by 2028.

The estimated total net present value of the estimated expenditure for closure and post-closure care is \$5,343,741 of which \$816,017 remains to be recognized.

District of Squamish

11. Provision for post-employment benefits

Information regarding the District's obligations for post-employment benefits is as follows:

	2020	2019
Liability, beginning of year	\$ 1,244,500	\$ 1,148,300
Current service cost	214,200	99,400
Interest cost	45,400	36,500
Benefit payments	(92,100)	(35,000)
Amortization of net actuarial gain	40,300	(4,700)
Liability, end of year	\$ 1,452,300	\$ 1,244,500

The District provides future benefits to all of its eligible employees through a Sick Leave Plan, a Full Annual Vacation at Retirement Plan, and a Retirement Pay Plan (collectively as the "Plans"). The Sick Leave Plan entitles employees to twelve sick days per year, based on one day for each month of service, up to a maximum of 150 days. Sick leave benefits can be used by the employee at any point up to their retirement date.

The Full Annual Vacation at Retirement Plan entitles employees to receive full annual vacation or vacation pay on retirement irrespective of the month of retirement. This benefit would be paid out in full to the employee upon their retirement. The Retirement Pay Plan entitles an employee to two days pay at the employee's normal rate of pay for each year or part of year worked. The benefit would be paid out in full to the employee upon their retirement.

There were no amendments to the above Plans during the year ended December 31, 2020. The total expense recorded in the financial statements in respect of obligations under the Plan amounts to \$299,900 (2019 - \$131,200).

Actuarial gains and losses are amortized over fourteen years, being the expected average remaining service period of the related employee group, commencing the year after the gain or loss arises.

	2020	2019
Accrued benefit obligation, end of year	\$ 1,922,300	\$ 1,753,300
Unamortized gain	(470,000)	(508,800)
Liability, end of year	\$ 1,452,300	\$ 1,244,500

The most recent actuarial valuation of the District's employee future benefits was completed as at December 31, 2019 (updated in 2020). The significant actuarial assumptions adopted in measuring the District's accrued benefit obligation are as follows:

	2020	2019
Discount rates	1.90%	2.50%
Expected future inflation	1.90%	2.50%
Expected wage and salary	2.5 to 3.5%	2.5 to 3.5%

District of Squamish

12. Accumulated surplus

	2020	2019
Unappropriated surplus	\$ 5,415,191	\$ 2,776,805
Appropriated surplus		
Non-statutory reserves	10,231,589	6,527,372
Statutory reserves	50,679,085	41,761,473
	66,325,865	51,065,650
Investment in tangible capital assets	281,342,640	246,945,370
	\$ 347,668,505	\$ 298,011,020

The unappropriated surplus is the amount of accumulated surplus remaining after deducting the other accumulated surplus components. It is available to temporarily finance operations until planned revenues and borrowing proceeds are received.

Appropriated surplus is the amount of accumulated surplus, supported by a portion of the District's cash and receivables, that has been set aside by decision of Council for a specified purpose. The statutory reserves have been established by bylaw in accordance with the Community Charter and their use is restricted by the legislation. In the normal course of operations, these funds will be used to finance the future services or capital works for which they have been appropriated and can be employed for emergency expenditures and, if included in the annual financial plan bylaw, employed to stabilize taxation and utility fee rates.

Investment in tangible capital assets is equal to the net book value of the tangible capital, less related long term debt. In the normal course of operations, the tangible capital assets will be consumed / used to provide services and the debt repaid by future period revenues.

13. Commitments and contingencies

(a) Litigation

The District is currently involved in certain legal actions and other existing conditions involving uncertainty. Financial implications of potential claims against the District, resulting from such litigation, and that are not covered by insurance, are accrued to the extent that amounts can be reasonably estimated.

As at December 31, 2020, there were legal claims in various stages of litigation for which management is unable to determine the outcome. The outstanding claims are not expected to result in a material loss to the District. As such, no provision has been made in the financial statements for these claims. Losses, if any, resulting from these actions will be recorded in the period the loss becomes likely and can be reasonably estimated.

(b) Municipal Pension Plan

The District and its employees contribute to the Municipal Pension Plan (a jointly trustee pension plan). The board of trustees, representing Plan members and employers, is responsible for administering the Plan, including investment of assets and administration of benefits. The Plan is a multi-employer defined benefit pension plan. Basic pension benefits are based on a formula. As at December 31, 2020, the Plan has about 213,000 active members and approximately 106,000 retired members. Active members include approximately 41,000 contributors from local governments.

Every three years an actuarial valuation is performed to assess the financial position of the Plan and the adequacy of Plan funding. The actuary determines an appropriate combined employer and member contribution rate to fund the Plan. The actuary's calculated contribution rate is based on the entry-age normal cost method, which produces the long term rate of member and employer contributions sufficient to provide benefits for average future entrants to the Plan. This rate may be adjusted for the amortization of any actuarial funding surplus and will be adjusted for the amortization of any unfunded actuarial liability.

District of Squamish

(b) Municipal Pension Plan (continued)

The most recent valuation as at December 31, 2018 indicated a \$2,866 million funding surplus for basic pension benefits on a going concern basis.

In 2020, the District paid \$1,531,938 (2019 - \$1,389,743) for employer contributions and employees contributed \$1,336,833 (2019 - \$1,208,501) to the Plan.

The next valuation will be as at December 31, 2021 with results available in 2022.

Employers participating in the Plan record their pension expense as the amount of employer contributions made during the fiscal year (defined contribution pension plan accounting). This is because the Plan records accrued liabilities and accrued assets for the Plan in aggregate resulting in no consistent and reliable basis for allocating the obligation, assets and cost to the individual employers participating in the Plan.

(c) Demand notes

The District issues its debt instruments through the MFA. The District also executes demand notes in connection with each debenture whereby the District may be required to loan amounts to the MFA. These demand notes are contingent in nature and are not reflected in the consolidated financial statements.

(d) Squamish Oceanfront front ender and municipal share agreements

As permitted under the Local Government Act, The District entered into a Development Cost Charge (DCC) Front Ender Agreement and Municipal Share Agreements in 2015 for specified off-site infrastructure projects necessary for the development of Oceanfront Lands sold to Matthews Southwest and Bethel Lands Corporation (The Developer) in 2014.

The Agreements provide for the reimbursement of a maximum of \$33,915,438 over a 20 year period for specified DCC projects that the Developer pays for and builds on behalf of the District. Within the agreements there are conditions and restrictions that may limit the reimbursement paid by the District. A key restriction is that reimbursement for most of the specified projects may not exceed 78% of DCC collections received by the District per quarter, during the time when invoices are outstanding. Further, any amounts outstanding at the end of the 20 year term are forgiven.

Only projects identified in the Municipal Share Agreements are eligible for reimbursement of the municipal share portions of the project and only at the time of project completion. The District has discretion to fund and build any project identified in the Agreements and the Developer is not bound to proceed with development activities.

14. Financial Plan

For 2020, the financial plan amounts presented throughout the consolidated financial statements are based on the budget (referred to as the Financial Plan bylaw 2736 in the legislation) adopted by Council on February 18, 2020. The financial plan does not include certain revenues for transfers from reserves and internal sources, and debt proceeds. The financial plan amounts are presented on a consolidated basis and include civic corporations.

The District's financial plan does not incorporate the operation of its two controlled civic corporations: SPL and SSC. The following reconciles the District's financial plan to the budget figures as presented on the financial statements

	Financial Plan Adjustments As Presented		
<u>Revenues</u>			
Departmental revenues	\$ 57,420,669	\$ (188,000)	\$ 57,232,669
<u>Expenses</u>			
Departmental expenses	53,986,638	-	53,986,638
Annual surplus before other	\$ 3,434,031	\$ (188,000)	\$ 3,246,031
Other	14,134,500	818,000	14,952,500
Annual Surplus	\$ 17,568,531	\$ 630,000	\$ 18,198,531

District of Squamish

15. Taxation and utility revenues

Collection for District

The following shows the collections in 2020 for District purposes, including applicable civic corporations:

	Financial Plan	2020	2019
Taxation			
General property levies	\$ 30,889,500	\$ 30,059,221	\$ 29,407,253
Business improvement area	91,570	93,825	91,537
	30,981,070	30,153,046	29,498,790
Other property levies			
Grants-in-lieu of property levies	725,100	777,232	759,354
Hotel tax	-	286,662	536,396
1% utility revenue	294,830	295,841	293,435
Penalties and interest on property levies	300,000	225,107	307,088
	1,319,930	1,584,842	1,896,273
	32,301,000	31,737,888	31,395,063
Utility user fees			
Water	4,848,000	5,157,467	4,793,620
Waste water	6,070,000	6,534,642	6,315,078
Solid waste	4,828,100	4,818,918	4,496,146
	15,746,100	16,511,027	15,604,844
	\$ 48,047,100	\$ 48,248,915	\$ 46,999,907

Collection for other agencies

The following amounts were collected on behalf of other taxing authorities, and are not included on the District's Consolidated Statement of Operations:

	2020	2019
Province of BC School Taxes	\$ 10,586,233	\$ 12,600,081
BC Assessment Authority	436,001	396,492
Municipal Finance Authority	1,908	1,846
Squamish-Lillooet Regional District	1,854,764	1,735,219
Sea to Sky Regional Hospital District	278,752	283,397
	\$ 13,157,658	\$ 15,017,035

District of Squamish

16. Government transfers and other contributions

	2020	2019
Operating		
Federal	\$ 876,814	\$ 1,707,571
Provincial	4,395,409	831,060
Other	160,410	151,023
Total operating	5,432,633	2,689,654
Capital		
Provincial	\$ 262,732	\$ 3,807,984
Other	55,000	55,000
Total capital	317,732	3,862,984
	\$ 5,750,365	\$ 6,552,638

17. Trusts

The District trust funds account for assets that must be administered as directed by agreement or statute for certain beneficiaries. In accordance with PSAS, trust funds are not included in the District's consolidated financial statements.

The District operates the Mount Garibaldi Cemetery and maintains the Cemetery Care Fund in accordance with the Cemeteries and Funeral Services Act. The following trust funds are administered by the District and are excluded from these consolidated financial statements.

Cemetery Care Fund financial position as at December 31, 2020:

	2020	2019
Financial Assets		
Investments	\$ 261,181	\$ 249,076
Liabilities		
Cemetery care fund	\$ 261,181	\$ 249,076

District of Squamish

18. Segmented information

The District is a diversified municipal government that provides a wide range of services to its citizens, including General Government; Protective Services; Transportation and Transit; Economic and Community Development; Recreation, Parks, Trails and Library; Public Health; Water, Waste Water and Solid Waste Utilities. For management reporting purposes, the Corporation's operations and activities are organized and reported by Fund. Funds were created for the purpose of recording specific activities to attain certain objectives in accordance with special regulations, restrictions or limitations.

Municipal services are provided by departments and their activities reported within these funds. Certain functions that have been separately disclosed in the segmented information, along with the services they provide, are as follows:

General Government

General government and fiscal services is comprised of Council and the related support services provided by the Administration and Finance departments, as well as all operations and maintenance costs relating to Municipal Hall and grants to community organizations.

Protective Services

Protective Services is comprised of police, fire, emergency management planning, bylaw enforcement, animal control and building inspection.

Transportation and Transit

Transportation and Transit is a broad function comprised of engineering departments and the public works crews engaged in the maintenance and improvements to the road systems, drainage, sidewalks, flood protection, fleet maintenance, works yard maintenance and other planning and maintenance activities. In addition, this function includes transit services and airport operations.

Economic and Community Development

Economic and Community Development is comprised of planning and land use development, environmental planning, economic development and events management with the common goal of developing Squamish into a healthy, vibrant and economically viable community. In addition, the District's civic corporations, Squamish Sustainability Corporation have been consolidated into this function for reporting purposes.

Recreation, Parks, Trails and Library

Recreation, Parks, Trails and Library is comprised of the arena and community centre, seniors centre, youth centre and an extensive networks of parks and trail systems throughout the community. In addition, the District's civic corporation, the Squamish Public Library, has been consolidated into this function for reporting purposes.

Public Health

Public health service is comprised of the municipal cemetery services.

Water and Waste Water Utilities

The water and waste water utilities is comprised of the water and waste water system networks, storm mains and pump stations.

Solid Waste Utility

The solid waste utility is comprised of garbage, recycling, organic waste collection services as well as the operation of the landfill.

19. Comparative figures

The comparative figures have been reclassified to conform with the consolidated financial statement format adopted in the current year.

20. COVID - 19

On January 30, 2020, the World Health Organization ("WHO") announced a global health emergency because of a new strain of coronavirus (the "COVID-19 outbreak") and the risks to the international community as the virus spreads globally beyond its point of origin. On March 11, 2020, the COVID-19 outbreak was declared a global pandemic by the WHO.

As the impacts of COVID-19 continue, there could be further effects on the District, its funders, and its vendors. The City has continued to deliver essential services throughout the pandemic. Management is actively monitoring the effect on its financial condition, liquidity, operations, and workforce. Given the daily evolution of the COVID-19 outbreak and the global responses to curb its spread, the District is not able to fully estimate the effects of the COVID-19 outbreak on its results of operations, financial conditions, or liquidity at this time.



District of Squamish
Schedule 1 - Tangible capital assets

For the year end December 31 2020												
	Land	Land Improvements	Buildings	Furniture, Vehicles and Equipment	Transportation Infrastructure	Solid Waste Infrastructure	Water Infrastructure	Waste Water Infrastructure	Assets under Construction	2020 Actual		
Opening Balance	\$ 61,346,098	\$ 35,932,333	\$ 41,756,619	\$ 19,782,814	\$ 92,793,955	\$ 11,778,487	\$ 60,995,656	\$ 60,006,637	\$ 9,466,192	\$	\$ 393,858,791	
Add: Additions	10,168,477	9,874,815	281,531	2,119,922	15,630,595	1,042,544	6,916,433	7,370,399	4,455,305		57,860,021	
Less: Disposals	-	-	-	(478,353)	-	-	-	-	-	-	(478,353)	
Add: Transfers	-	-	-	-	-	-	-	-	(4,904,678)	-	(4,904,678)	
Less: Writedowns	-	-	-	-	-	-	-	-	(71,249)	-	(71,249)	
Closing Balance	71,514,575	45,807,148	42,038,150	21,424,383	108,424,550	12,821,031	67,912,089	67,377,036	8,945,570		446,264,532	
ACCUMULATED AMORTIZATION												
Opening Balance	-	9,277,679	19,798,026	9,666,027	39,311,652	2,075,042	20,002,382	22,909,010	-	-	123,039,818	
Add: Amortization	-	849,962	847,000	1,630,050	2,395,092	1,119,293	1,092,498	1,152,116	-	-	9,086,011	
Less: Acc Amortization on Disposals	-	-	-	(472,605)	-	-	-	-	-	-	(472,605)	
Add: Transfers	-	-	-	-	-	-	-	-	-	-	-	
Less: Writedowns	-	-	-	-	-	-	-	-	-	-	-	
Closing Balance	-	10,127,641	20,645,026	10,823,472	41,706,744	3,194,335	21,094,880	24,061,126	-		131,653,224	
Net Book Value, year ended 2020	\$ 71,514,575	\$ 35,679,507	\$ 21,393,124	\$ 10,600,911	\$ 66,717,806	\$ 9,626,696	\$ 46,817,209	\$ 43,315,910	\$ 8,945,570		\$ 314,611,308	



District of Squamish
Schedule 2 - Tangible Capital Assets

For the year end December 31 2019
COST

	Land	Land Improvements	Buildings	Furniture, Vehicles and Equipment	Transportation Infrastructure	Solid Waste Infrastructure	Water Infrastructure	Waste Water Infrastructure	Assets under Construction	2019 Actual
Opening Balance	\$ 60,498,903	\$ 29,292,523	\$ 41,764,619	\$ 16,507,258	\$ 89,297,207	\$ 5,424,145	\$ 56,682,093	\$ 57,337,933	\$ 12,667,598	\$ 369,472,279
Add: Additions	847,195	6,306,706	82,600	3,335,836	4,421,733	6,354,342	3,854,475	3,423,535	4,945,458	33,571,880
Less: Disposals	-	-	-	(177,664)	-	-	-	-	-	(177,664)
Add: Transfers	-	323,491	(90,600)	426,467	(232,891)	-	584,362	(1,010,829)	(8,146,864)	(8,146,864)
Less: Writedowns	-	9,613	-	(309,083)	(692,094)	-	(125,274)	255,998	-	(860,840)
Closing Balance	61,346,098	35,932,333	41,756,619	19,782,814	92,793,955	11,776,487	60,995,656	60,006,637	9,466,192	393,858,791
ACCUMULATED AMORTIZATION										
Opening Balance	-	8,556,084	18,938,259	8,923,606	37,031,109	1,693,394	18,967,797	21,827,368	-	115,937,617
Add: Amortization	-	-	844,862	988,298	2,277,673	381,648	997,418	999,101	-	7,203,754
Less: Acc Amortization on Disposals	-	-	-	(173,232)	-	-	-	-	-	(173,232)
Add: Transfers	-	-	-	-	-	-	-	-	-	-
Less: Writedowns	-	16,841	14,905	(82,645)	2,870	-	37,167	82,541	-	71,679
Closing Balance	-	9,277,679	19,798,026	9,666,027	39,311,652	2,075,042	20,002,382	22,909,010	-	123,039,818
Net Book Value, year ended 2019	\$ 61,346,098	\$ 26,654,654	\$ 21,958,593	\$ 10,116,787	\$ 53,482,303	\$ 9,703,445	\$ 40,993,274	\$ 37,097,627	\$ 9,466,192	\$ 270,818,973



District of Squamish
Schedule 3 - Statement of Operations by Segment

	Economic &										FY 2019
	General Government 10	Protective Services 20	Transportation & Transit 30	Community Development 40	Parks Recreation Culture 50	Health Social & Housing 60	Solid Waste Management 70	Water Services 80	Waste Water Services 90	FY 2020	
For the year end December 31											
Revenue											
Taxation (Note #15)	\$ 30,153,046	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 30,153,046
Other property levies (Note #15)	1,298,180	-	-	286,662	-	-	-	-	-	-	1,584,842
Utility user fees (Note #15)	-	-	-	-	-	-	-	-	6,534,642	-	16,511,027
Other revenue from own sources	31,780	55,118	700,612	164,313	388,297	27,762	5,157,467	1,000	-	-	1,368,882
Other fees and charges	1,030,872	1,544,515	222,128	560,371	(5,975)	3,465	282,684	232,466	108	-	3,850,634
Government transfers for operating (Note #16)	997,160	4,095,390	123,709	166,155	50,219	-	-	-	-	-	5,432,633
Investment income	1,526,162	-	-	-	5,548	-	10,891	127,149	127,611	-	1,797,361
	35,037,200	5,695,023	1,046,449	1,177,501	438,089	31,227	5,092,493	5,518,082	6,662,361	60,698,425	57,572,100
Expenses											
Payroll and benefits	5,635,212	4,109,205	3,554,862	1,822,901	3,923,724	34,642	167,354	796,686	638,875	20,683,461	19,324,852
Operating expenses	2,117,997	5,932,002	2,104,791	1,224,398	1,698,100	93,707	4,217,882	1,425,134	2,391,146	21,205,157	22,505,621
Debt service - interest	313,096	104,339	88,982	147,059	6,971	-	63,124	189,391	157,614	1,070,576	1,076,393
Amortization expense	5,613,078	-	-	10,030	98,995	-	1,119,293	1,082,498	1,152,117	9,086,011	7,203,754
	13,679,383	10,145,546	5,748,635	3,204,388	5,727,790	128,349	5,567,653	3,503,709	4,339,752	52,045,205	50,110,620
Annual surplus (deficit) before Other	21,357,817	(4,450,523)	(4,702,186)	(2,026,887)	(5,289,701)	(97,122)	(475,160)	2,014,373	2,322,609	8,653,220	7,461,480
Other											
Government transfers for capital (Note #16)	-	-	317,732	-	-	-	-	-	-	317,732	3,862,984
Developer cost charge capital revenues	-	-	64,278	-	-	-	-	322,797	209,073	596,148	2,672,620
Developer contributed assets	32,270,231	-	-	445,528	-	-	-	3,173,963	3,227,069	39,116,791	6,348,931
Gain (Loss) on disposal of tangible capital assets	551,345	-	-	-	(2,110)	-	-	-	-	549,235	(924,201)
Capital Connections	-	-	-	-	-	-	-	63,862	10,747	74,609	119,521
Other Capital revenues	-	125,356	166,455	-	-	-	-	43,184	14,755	349,750	38,049
	32,821,576	125,356	548,465	445,528	(2,110)	-	-	3,603,806	3,461,644	41,004,265	12,117,904
Annual Surplus (Deficit)	\$ 54,179,393	\$ (4,325,167)	\$ (4,153,721)	\$ (1,581,359)	\$ (5,291,811)	\$ (97,122)	\$ (475,160)	\$ 5,618,179	\$ 5,784,253	\$ 49,657,485	\$ 19,579,384



District of Squamish
Schedule 4 - Continuity of reserves

	Balance, beginning of year	Contributions	Investment Income	Expenditures	Transfers	Balance, end of year 2020	Balance, end of year 2019
Reserve Fund Transactions							
Sinking Fund Surplus - General	\$ 288,905	\$ -	\$ 5,100	\$ -	\$ -	\$ 294,005	\$ 288,905
Sinking Fund Surplus - Water	613,805	-	10,830	-	-	624,635	613,805
Sinking Fund Surplus - Waste Water	720,947	-	12,730	-	-	733,677	720,947
Land Sale - BL720	11,653,003	-	205,600	(11,445)	-	11,847,158	11,653,003
Equipment Replacement	5,806,051	905,500	105,350	(496,229)	-	6,320,672	5,806,051
Community Works Fund	4,997,727	876,814	85,270	(1,173,583)	-	4,786,228	4,997,727
Capital Rehab - General	5,921,189	2,475,950	108,670	(1,508,931)	(671,406)	6,325,472	5,921,189
Capital Rehab - Water	2,444,451	2,408,965	95,050	(1,177,398)	1,472,766	5,243,834	2,444,451
Capital Rehab - Waste Water	5,152,875	2,950,610	170,880	(1,083,807)	2,740,247	9,930,805	5,152,875
Capital Rehab - Solid Waste	1,492,341	379,685	29,910	-	24,484	1,926,420	1,492,341
Offstreet Parking	468,702	78,000	8,960	-	-	555,662	468,702
Alternative Transportation BL 2553	-	330,000	2,910	-	-	332,910	-
Affordable Housing BL 1951	1,091,227	163,120	20,700	-	-	1,275,047	1,091,227
Carbon Neutral BL2079	202,111	33,470	3,220	(72,988)	-	165,813	202,111
Vanoc Legacy BL2101	7,470	-	130	-	-	7,600	7,470
Parkland in Lieu	690,584	-	6,410	(655,345)	-	41,649	690,584
Corridor Trail MOU	207,039	-	3,650	-	-	210,689	207,039
Environmental Reserve Fund BL 2640	3,046	-	(46)	-	(3,000)	-	3,046
General Operating Reserve BL 2788	-	600,000	198,410	(61,601)	(680,000)	56,809	-
Total	\$ 41,761,473	\$ 11,202,114	\$ 1,073,734	\$ (6,241,327)	\$ 2,883,091	\$ 50,679,085	\$ 41,761,473

The following schedule has been prepared as supplementary information and is not audited or covered by the Independent Auditor's Report

District of Squamish
Schedule 5 - COVID - 19 Safe Restart Grant for Local Governments

For the year ended December 31	2020 Actual
Revenue shortfalls	\$ 734,823
Facility reopening and operating costs	93,233
Emergency planning and response costs	113,509
Computer and other electronic technology costs (to improve interconnectivity and virtual communications)	52,757
Services for vulnerable persons	3,732
Other related costs	219,368
	\$ 1,217,422

AUDITED FINANCIAL STATEMENTS

**District of Squamish
Consolidated Financial Statements
For the year ended December 31, 2021**



District of Squamish

December 31, 2021

Management's Responsibility for Financial Reporting

The Council of the District of Squamish (the "District") has delegated the responsibility for the integrity and objectivity of the financial information contained in the consolidated financial statements to the management of the District. The consolidated financial statements which, in part, are based on informed judgements and estimates, have been prepared by management in accordance with Canadian public sector accounting standards, which have been applied on a basis consistent with that of the preceding year.

To assist in carrying out their responsibility, management maintains an accounting system and internal controls to provide reasonable assurance that transactions are executed and recorded in accordance with authorization, and that financial records are reliable for preparation of financial statements.

The Mayor and Council oversee management's responsibilities for the financial reporting and internal control systems. Council annually reviews and approves the consolidated financial statements.

The District's independent auditors, BDO Canada LLP, are engaged to express an opinion as to whether these consolidated financial statements present fairly the District's consolidated financial position, operations, and cash flows in accordance with Canadian public sector accounting standards. Their opinion is based on procedures they consider sufficient to support such an opinion in accordance with Canadian generally accepted auditing standards.

The consolidated financial statements have, in management's opinion, been properly prepared within reasonable limits of materiality and in accordance with Canadian public sector accounting standards.

Heather Boxrud, MBA, CPA, CGA
Chief Financial Officer
May 3, 2022



Independent Auditor's Report

To the Mayor and Councillors of the District of Squamish

Opinion

We have audited the accompanying consolidated financial statements of the District of Squamish and its controlled entities (the "District"), which comprise the Consolidated Statement of Financial Position as at December 31, 2021, the Consolidated Statements of Change in Net Financial Assets, Operations, and Cash Flows for the year then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the District as at December 31, 2021, and the results of its operations, change in net financial assets, and cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally-accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Consolidated Financial Statements section of this report. We are independent of the District in accordance with the ethical requirements that are relevant to our audit of the consolidated financial statements in Canada and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the District's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the District or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the District's financial reporting process.

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.



Auditor's Responsibilities for the Audit of the Consolidated Financial Statements (Continued)

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the District's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the District to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the District to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

BDO Canada LLP

Chartered Professional Accountants

Whistler, British Columbia
May 4, 2022

District of Squamish
Consolidated Statement of Financial Position

December 31 **2021** **2020**

Financial Assets

Cash and cash equivalents (Note #3)	\$ 114,358,717	\$ 96,838,000
Investments (Note #4)	8,503,561	15,518,071
Accounts receivable (Note #5)	5,371,836	4,859,624
Debenture deposits (Note #6)	712,152	664,756
	128,946,266	117,880,451

Liabilities

Accounts payable, accrued and other liabilities (Note #7)	23,494,236	20,066,100
Deferred revenue (Note #8)	29,342,841	25,900,125
Debt (Note #9)	40,340,417	33,268,668
Provision for solid waste landfill (Note #10)	4,737,182	4,482,724
Provision for post-employment benefits (Note #11)	1,609,400	1,452,300
	99,524,076	85,169,917

Net Financial Assets

	29,422,190	32,710,534
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Non-Financial Assets

Tangible capital assets (Schedules 1 and 2)	329,469,312	314,611,308
Inventories	489,615	109,160
Prepaid expenses	518,971	237,503
	330,477,898	314,957,971

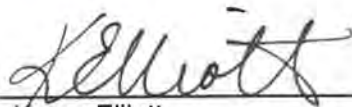
Accumulated Surplus (Note #12)

	\$ 359,900,088	\$ 347,668,505
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Commitments and contingencies (Note #13)



Heather Boxrud, MBA, CPA, CGA
Chief Financial Officer



Karen Elliott
Mayor of Squamish

District of Squamish Consolidated Statement of Operations

For the year ended December 31	Financial Plan		2020
	2021 (Note #14)	2021	
Revenue (Schedule 3)			
Taxation (Note #15)	\$ 32,001,700	\$ 31,483,855	\$ 30,153,046
Other property levies (Note #15)	1,291,500	1,766,690	1,584,842
Utility user fees (Note #15)	16,226,900	17,868,987	16,511,027
Other revenue from own sources	1,704,939	1,950,265	1,368,882
Other fees and charges	4,919,967	4,505,193	3,850,634
Government transfers for operating (Note #16)	1,105,130	3,012,328	5,432,633
Investment income	803,000	1,671,245	1,797,361
	<u>58,053,136</u>	<u>62,258,563</u>	<u>60,698,425</u>
Expenses (Schedule 3)			
General Government	14,298,097	16,293,834	13,679,381
Protective Services	11,806,757	12,182,588	10,145,546
Transportation & Transit	6,169,044	5,749,926	5,748,636
Economic & Community Development	3,503,163	3,650,296	3,204,389
Parks, Recreation & Culture	6,915,087	6,602,333	5,727,790
Health, Social & Housing	192,212	314,813	128,349
Solid Waste Management	5,489,009	6,059,519	5,567,653
Water Services	3,782,770	3,831,877	3,503,710
Waste Water Services	5,003,425	4,891,435	4,339,751
	<u>57,159,564</u>	<u>59,576,621</u>	<u>52,045,205</u>
Annual surplus before Other	<u>893,572</u>	<u>2,681,942</u>	<u>8,653,220</u>
Other			
Government transfers for capital (Note #16)	7,781,200	892,110	317,732
Developer cost charge capital revenues	6,029,550	1,406,334	596,148
Developer contributed assets	-	7,374,361	39,116,791
Gain (Loss) on disposal of tangible capital assets	-	(250,252)	549,235
Capital Connections	80,000	64,676	74,609
Other Capital revenues	-	62,412	349,750
	<u>13,890,750</u>	<u>9,549,641</u>	<u>41,004,265</u>
Annual Surplus	<u>14,784,322</u>	<u>12,231,583</u>	<u>49,657,485</u>
Accumulated Surplus, beginning of year	<u>347,668,505</u>	<u>347,668,505</u>	<u>298,011,020</u>
Accumulated Surplus, end of year	<u>\$ 362,452,827</u>	<u>\$ 359,900,088</u>	<u>\$ 347,668,505</u>

District of Squamish
Consolidated Statement of Change in Net Financial Assets

For the year ended December 31	Financial Plan 2021 (Note #14)	2021	2020
Annual surplus	\$ 14,784,322	\$ 12,231,583	\$ 49,657,485
Acquisition of tangible capital assets	(53,014,430)	(23,119,541)	(14,212,832)
Contributed tangible capital assets	-	(2,473,371)	(38,671,263)
Amortization expense	7,240,000	10,427,595	9,086,011
Loss (gain) on disposal of tangible capital assets	-	250,252	(549,235)
Proceeds on sale of tangible capital assets	-	57,060	554,984
	(45,774,430)	(14,858,005)	(43,792,335)
Other non-financial assets			
Decrease (increase) in inventories	-	(380,455)	38,579
Increase in prepaid expenses	-	(281,467)	(10,994)
	-	(661,922)	27,585
Change in net financial assets	(30,990,108)	(3,288,344)	5,892,735
Net financial assets, beginning of year	32,710,534	32,710,534	26,817,799
Net financial assets, end of year	\$ 1,720,426	\$ 29,422,190	\$ 32,710,534

District of Squamish Consolidated Statement of Cash Flows

For the year ended December 31	2021	2020
Cash provided by (used in)		
Operating transactions		
Annual surplus	\$ 12,231,583	\$ 49,657,485
Non-cash items included in annual surplus		
Amortization	10,427,595	9,086,011
Contributed tangible capital assets	(2,473,371)	(38,671,263)
Loss (gain) on disposal of tangible capital assets	250,252	(549,235)
Provision for post employment benefits	157,100	207,800
Development cost charges revenue recognized	(1,406,334)	(596,148)
Earnings on debt sinking funds (actuarial adjustment)	(795,666)	(740,877)
Provision for landfill closure	254,458	287,025
Changes in other non-cash working capital	4,815,499	3,156,574
	23,461,116	21,837,372
Investing transactions		
Decrease (increase) in investments	7,014,510	(144,952)
Capital transactions		
Acquisition of tangible capital assets	(23,119,541)	(14,212,832)
Proceeds from sale of tangible capital assets	57,060	554,984
	(23,062,481)	(13,657,848)
Financing transactions		
Development cost charges received, including interest	2,240,157	2,377,653
Proceeds of the long-term portion of Debt	3,856,362	13,943,927
Capital leases	(19,008)	90,636
Proceeds (repayment) of the short-term portion of Debt	7,500,000	(2,062,370)
Debt principal repaid	(3,469,939)	(1,836,249)
	10,107,572	12,513,597
Increase in cash	17,520,717	20,548,169
Cash and cash equivalents, beginning of year	96,838,000	76,289,831
Cash and cash equivalents, end of year (Note #3)	\$ 114,358,717	\$ 96,838,000
Supplemental information:		
Interest paid	\$ 1,081,975	\$ 1,070,577

Notes to the Consolidated Financial Statements

December 31, 2021

The Notes to the Consolidated Financial Statements are an integral part of the financial statements. The following explains the significant accounting policies and reporting principles underlying these statements. The Notes also provide relevant supplementary information and explanations.

1. Status of The District of Squamish

The District of Squamish (the "District") is a municipality that was incorporated on December 15, 1964 pursuant to the Municipal Act and subsequently continued under the Local Government Act, a statute of the Legislature of the Province of British Columbia (the "Province"). The District is subject to the provisions of the Community Charter and legislation under the Province. The District's principal activity is providing property tax funded services such as general government, protective (police and fire), transportation, economic and community development, and parks and recreation. The District provides public utilities for solid waste, water, and waste water services. The District also operates a cemetery and an aquatic centre (facility is owned and governed by the Squamish-Lillooet Regional District) and provides the community with library and other services.

2. Significant accounting policies

The consolidated financial statements have been prepared by management in accordance with Canadian public sector accounting standards ("PSAS"). The significant accounting policies are summarized below:

Basis of consolidation

The consolidated financial statements include the assets, liabilities, reserves, surpluses/deficits, revenues, and expenses of those District funds and government functions or entities which have been determined to comprise a part of the aggregate District operations based upon control exercised by the District. Inter-fund and inter-corporate balances and transactions have been eliminated.

I) Consolidated entities

The organizations (referred to as subsidiaries or civic corporations) included in the consolidated financial statements are as follows:

Squamish Public Library ("SPL"), which was incorporated without share capital as a municipal library of the District on May 15, 2003.

Squamish Sustainability Corporation ("SSC"), which was incorporated with the District as the sole shareholder on October 13, 2005.

II) Squamish District Community Pool

The Squamish-Lillooet Regional District ("SLRD") has contracted with the District to provide aquatic centre ("Squamish District Community Pool") recreational services. The District provides the programs and services at the Squamish District Community Pool on behalf of the SLRD. This facility was established and constructed under authority of the SLRD Service Area Establishment Bylaw No. 438. The related assets, liabilities, revenues, and expenses are reported in the SLRD financial statements, as the taxing authority and owner of the facility. Therefore, the District does not include any portion of the Squamish District Community Pool financial position or operations in the consolidated financial statements.

Basis of accounting

The consolidated financial statements are prepared using the accrual basis of accounting. The accrual basis of accounting records revenue as it is earned and measurable. Expenses are recognized as they are incurred and measurable based upon receipt of goods or services and / or the creation of a legal obligation to pay.

District of Squamish

Basis of accounting (continued)

I) Fund accounting

As a local government, the District uses fund accounting. The resources and operations of the District have been segregated for accounting and financial reporting purposes into the following funds, which are presented as supplementary information: General, Solid Waste, Water, and Waste Water.

II) Segment disclosure

The District segregates its operations for financial reporting based upon group of activities / services. A segment is defined as a distinguishable activity or group of activities / services of a government for which it is appropriate to separately report financial information. The District provides this additional segment information in Schedule 3.

Deferred revenue

Government transfers, contributions and other amounts are received from third parties pursuant to legislation, regulation, or agreement. They may only be used in the conduct of certain programs, in the completion of specific work or for the acquisition and construction of tangible capital assets. In addition, certain user fees and development cost charges ("DCC") are collected for which the related services or capital costs have yet to be performed. Revenue is recognized in the period when the related expenses (such as development costs) are incurred, services performed or the tangible capital assets are acquired.

Debt

Debt is recorded at cost net of principal repayments and actuarial adjustments in accordance with Municipal Finance Authority of British Columbia ("MFA").

Contaminated sites

Governments are required to accrue a liability for the costs to remediate a contaminated site. The District recognizes a liability, at the estimated net present value of remediation cost, when an environmental standard exists, contamination exceeds the standard, the government has responsibility for remediation, future economic benefits will be given up, and a reasonable estimate can be made.

Solid waste landfill

The obligation of closure and post-closure costs associated with the solid waste landfill site is based on the present value of estimated future expenses.

Employee future benefits

The District and its employees make contributions to the Municipal Pension Plan ("MPP"). These District contributions are expensed as incurred.

For post-employment benefits, the District accrues for the employees' Sick Leave Plan, Full Annual Vacation at Retirement Plan, and the Retirement Pay Plan. The liabilities related to these benefits are actuarially determined based on period of service and best estimates of retirement ages and expected salaries. The liabilities under these benefit plans are accrued based on projected benefits as the employees render services necessary to earn the future benefits.

Non-Financial assets

Non-financial assets are held for use in the provision of goods and services but are not available to discharge existing liabilities. These assets may have a useful life extending beyond the current year and are not intended for sale in the ordinary course of operations.

Intangible assets, such as water rights and mineral resources, are not recorded in the financial statements.

District of Squamish

Significant accounting policies (continued)

Tangible capital assets

Tangible capital assets are recorded at cost which includes amounts that are directly attributable to the acquisition, construction, development, or betterment of the assets. The cost, less residual value, of the tangible capital assets (excluding land) is amortized on a straight-line basis over their estimated useful life as follows:

Fund	Asset Category	Useful Life Range (years)
General	Land	n/a
	Land improvements	5 to 200
	Buildings	5 to 60
	Furniture, vehicles, and equipment	3 to 40
	Transportation infrastructure	5 to 100
Solid Waste	Solid waste infrastructure	12 to 50
Water	Water infrastructure	5 to 100
Waste Water	Waste water infrastructure	5 to 100

Tangible capital assets, including assets under construction, are recorded at cost. Amortization is charged over the asset's useful life in a rational and systematic manner, considering cost less any residual value. Assets under construction are not amortized. When assets are substantially complete and available for use, they cease to be classified as assets under construction and their period of amortization begins.

Contributed tangible capital assets are recognized at fair value (using various methods including actual developer costs, appraisals, assessed values or professional estimations) at the date of contribution and are also recognized as revenue. Where an estimate of fair market value cannot be made, the tangible capital asset is recognized at nominal value.

Leases are classified as capital or operating leases. Leases which transfer substantially all of the benefits and risks incidental to ownership of property are classified as capital, and the related assets are accounted for as tangible capital assets. All other leases are classified as operating leases and the related lease payments are charged to expenses as incurred.

The District's tangible capital assets do not include works of art, historical artifacts / treasures or natural environment assets.

Inventories

Inventories are recorded at the lower of cost and replacement cost. Donated materials are initially recorded at their fair market value, if determinable, and subsequently at the lower of cost and replacement cost.

Tax revenues

Taxes are levied to provide revenue to the District for the provision of public services. Tax revenues are recognized as revenue in the year they are levied as the tax revenues result from non-exchange transactions that are compulsorily paid to local governments in accordance with the established laws and regulations. The tax revenues include levies on behalf of consolidated entities, business improvement area(s) and utility frontage taxes.

The property tax revenue relies on market assessments of land value that are subject to appeal. Through the British Columbia Assessments appeal process, taxes may be adjusted by way of supplementary roll adjustments. Estimates are made of potential adjustments to taxes. Any additional adjustments required over those estimated are recognized at the time they are awarded.

The District is required by the Province and other taxing authorities to collect and remit levies in respect of properties. The District has no jurisdiction or control over these levies. Therefore, levies imposed by other taxing authorities are not reflected as a District revenue and expense. The funds collected are presented as a payable to the taxing authority.

District of Squamish

Significant accounting policies (continued)

Government transfers

Government transfers are transfers of monetary assets or tangible capital assets to or from the District that are not the result of an exchange transaction, a direct financial return, or expected to be repaid in the future. Government transfers, which include legislative grants, are recognized as revenue in the consolidated financial statements when the transfer is authorized and any eligibility criteria have been met, stipulations, if any, have been met and reasonable estimates of the amounts can be determined.

When transfers include stipulations that gives rise to an obligation that meets the definition of a liability, the transfers are deferred and recognized when the stipulations have been met.

Other revenues

The District recognizes other revenue for the provision of utility and other public services. Sale of services and other revenue are recognized on an accrual basis.

The utility services include water, waste water, and solid waste. The revenue for water, waste water, and solid waste usage are recorded as user fees. Other utility revenues are recorded for servicing properties such as connection fees, which are recognized when the connection has been established.

Other sales of goods and services include revenue from other government services such as general government, transportation, economic and community development, parks and recreation and the consolidated civic corporations.

Estimates

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosures of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reported period. Actual results will depend on future economic events and could differ from those estimates. The significant areas requiring management estimates include accrued and other liabilities, provision for landfill closure and post closure costs, provision for post employment benefits, and the useful lives of tangible capital assets.

Contingent Liabilities

Liabilities for potential obligations that are contingent on future events are recognized when it is likely that the future event will confirm the existence of the obligation and the amount of the liability can be reasonably estimated. Disclosure for potential obligations that do not meet the threshold is made when the occurrence of the confirming future event is likely but the amount of the liability cannot be reasonably estimated, or the occurrence of the confirming future event is not determinable.

Financial plan

The 2021 financial plan is included on the consolidated statements of operations and accumulated surplus and change in net financial assets. The budget is compiled from the District Council approved operating budget, adjusted for consolidated entities (Note # 14).

District of Squamish

3. Cash and cash equivalents

	2021	2020
Cash	\$ 111,380,620	\$ 93,575,131
Cash equivalents	2,786,954	3,164,983
Cash held by civic corporations	191,143	97,886
	\$ 114,358,717	\$ 96,838,000

The District's Operating Account, presented as "Cash" is comprised of deposits at the Bank of Nova Scotia ("BNS") and accrues interest at a rate of the BNS Reference Rate + 0.3% (2020 - BNS Reference Rate + 0.46%)

Cash Equivalents are comprised of BNS " Notice Plan" deposits which accrue interest at a rate of the BNS Reference Rate + 0.35% (2020 - BNS Reference Rate + 0.56%) and requires 20 days notice to liquidate.

4. Investments

	2021	2020
Term Deposits	\$ 5,301,886	\$ 15,239,414
MFA Mortgage Fund	3,029,684	-
Investments held by civic corporations	171,991	278,657
	\$ 8,503,561	\$ 15,518,071

Term deposits consist of Guaranteed Investment Certificates maturing September 2022 and earn 2.58% interest (2020 - between 2.35% and 2.58%).

The MFA Mortgage Fund is recorded at cost and income distributions are received as additional units of the fund.

5. Accounts receivable

	2021	2020
Property taxes	\$ 2,093,226	\$ 1,863,738
Government transfers	526,114	333,774
Utilities	1,048,180	983,500
GST	631,174	499,836
Trade accounts and other	1,087,679	1,191,727
Allowance for doubtful accounts	(14,537)	(12,951)
	\$ 5,371,836	\$ 4,859,624

The District receives government transfers from senior levels of government, including the Province of British Columbia and the Federal Government of Canada.

The District, as a local government, receives goods and services tax ("GST") rebates and input tax credits from the Canada Revenue Agency, Government of Canada.

District of Squamish

6. Debenture deposits

The District's debenture deposits are reported by fund as follows:

	2021	2020
General	\$ 469,566	\$ 429,999
Solid waste	73,406	71,028
Water	82,414	81,339
Waste water	86,766	82,390
	\$ 712,152	\$ 664,756

The District issues its debt instruments through the MFA. A portion of the debenture proceeds is withheld in the debt reserve fund by the MFA; these are considered District cash deposits and are a condition of the borrowings. These deposits are invested by MFA and earn a return net of expenses. They are refundable upon maturity of the underlying debt.

7. Accounts payable, accrued and other liabilities

	2021	2020
Accrued liabilities and trade liabilities	\$ 16,161,584	\$ 14,434,569
Wages and benefits payable	1,072,870	1,357,069
Accrued interest payable	232,318	226,664
Other liabilities	6,027,464	4,047,798
	\$ 23,494,236	\$ 20,066,100

8. Deferred revenue

	2021	2020
Development cost charges, beginning of year	\$ 22,083,691	\$ 20,302,185
Contributions	1,947,157	2,062,557
Interest earned	293,000	370,831
Expenditures	(1,406,334)	(704,732)
Transfers	-	52,850
Development cost charges, end of year	22,917,514	22,083,691
Other deferred revenue	6,425,327	3,816,434
	\$ 29,342,841	\$ 25,900,125

Deferred revenue are short-term in nature, with the exception of the deferrals dedicated for developments and capital projects. The development cost charges are funds restricted by bylaw for the purpose which they were collected from developers. The District holds these restricted funds in accounts (general, solid waste, water, and waste water) for the required use of the funds.

District of Squamish

9. Debt

The District's debt by specific by-law:

Fund	Maturity year	Interest rate	Purpose	By-law	2021	2020
General						
	2025	n/a	Capital Leases	n/a	\$ 87,077	\$ 106,086
	2022	1.75	Police Building	1679	374,466	731,099
	2026	1.75	Forestry Building	1917	908,257	1,069,497
	2027	4.82	Business Park	1945	1,216,675	1,393,048
	2029	4.90	Business Park	2029	1,436,681	1,586,604
	2031	4.20	Arena Roof	2064	423,697	457,629
	2031	4.20	Roads and Drainage	2051	664,368	717,576
	2022	2.90	Facilities	2137	64,071	125,682
	2027	2.90	General Capital Works	2166	640,864	733,766
	2023	3.85	General Capital Works	2166	103,029	151,592
	2023	3.85	Facilities	2137	27,767	40,861
	2033	3.85	General Capital Works	2208	319,717	340,176
	2023	3.85	General Capital Works	2208	99,290	146,089
	2023	3.85	Parks Capital Works	2214	42,104	61,949
	2031	3.64	Dike Construction and Rehabilitation	2051	257,677	272,579
	2029	3.00	Flood Protection	2166	68,248	75,370
	2024	3.00	Systems & Equipment	2208	38,752	50,688
	2029	3.00	Bridge, Flood Protection, and Arena Lighting	2208	504,671	557,336
	2029	3.00	Bridge	2282	210,007	231,922
	2035	2.75	General Capital Works	2051	77,808	82,061
	2030	2.75	General Capital Works	2331	36,249	39,627
	2030	2.75	General Capital Works	2282	442,164	483,367
	2031	2.10	General Capital Works	2051	400,579	434,504
	2022	1.95	General Capital Works	2208	57,260	112,852
	2032	3.15	General Capital Works	2282	492,750	530,102
	2027	3.15	General Capital Works	2392	113,293	130,298
	2033	3.20	General Capital Works	2530	268,379	286,738
	2023	2.90	General Capital Works	2534	129,685	191,709
	2029	2.24	General Capital Works	2533	415,618	460,995
	2025	0.91	General Capital Works	2331	550,200	681,887
	2030	0.91	General Capital Works	2392	1,545,448	1,702,738
	2030	0.91	General Capital Works	2444	1,145,990	1,262,626
	2030	0.91	General Capital Works	2600	972,717	1,071,717
	2030	0.91	General Capital Works	2687	325,825	358,986
	2035	0.91	General Capital Works	2536	731,970	777,763
	2035	0.91	General Capital Works	2599	546,612	580,808
	2040	0.91	General Capital Works	2465	1,580,672	1,650,300
	2030	1.98	General Capital Works	2687	1,021,112	-
	2041	2.58	General Capital Works	2777	2,363,224	-
					\$ 20,704,973	\$ 19,688,627

District of Squamish

9. Debt (continued)

Fund	Maturity year	Interest rate	Purpose	By-law	2021	2020
Solid Waste						
	2025	2.75	Landfill Capital Projects	2137	\$ 90,403	\$ 111,126
	2023	3.85	Landfill Capital Projects	2137	43,753	64,369
	2022	2.90	Landfill Capital Projects	2137	15,681	30,756
	2029	2.24	Landfill Capital Projects	2535	1,304,865	1,447,331
	2025	0.91	Landfill Vertical Expansion	2535	2,671,495	3,310,901
	2025	0.91	Landfill Vertical Expansion	2691	1,228,051	1,521,978
	2026	1.25	Landfill Vertical Expansion	2691	143,743	-
					\$ 5,497,991	\$ 6,486,461
Water						
	2027	4.82	Water Systems	1944	162,632	186,208
	2032	2.90	Water Systems	2167	203,905	218,442
	2029	4.90	Water Systems	2052	326,300	360,351
	2032	2.90	Water Systems	2138	164,906	176,663
	2031	4.20	Water Capital Works	2052	351,929	380,114
	2028	3.85	Water Capital Works	2209	459,711	515,676
	2023	3.85	Watermain Replacement	2167	72,042	105,999
	2029	3.00	PRV, Meters, Stations, and Mains	2167	123,264	136,127
	2029	3.00	Watermain Replacement	2209	214,656	237,056
	2029	3.00	Water Capital Works	2283	542,774	599,416
	2030	2.75	Water Capital Works	2283	127,274	139,134
	2022	1.95	Water Capital Works	2209	47,496	93,608
	2032	3.15	Water Capital Works	2445	391,444	421,117
	2040	0.91	Water Capital Works	2393	671,790	701,382
	2035	0.91	Water Capital Works	2532	303,832	322,840
					\$ 4,163,955	\$ 4,594,133
Waste Water						
	2024	2.40	Waste Water Treatment Plant Mamquam	1756	\$ 642,450	\$ 836,536
	2028	4.65	Sewer Mains	1977	285,752	320,540
	2032	2.90	Trunk Sanitary Sewer Mains	2156	305,996	327,813
	2033	3.85	Sewer Capital Works	2168	131,670	140,095
	2029	3.00	Sanitary Sewer Trunk Line	2156	87,986	97,168
	2029	3.00	Centrifuge, Trunk, Lift Station, and Crane	2211	164,338	181,487
	2030	2.75	Sewer Capital Works	2211	504,606	551,628
	2022	1.95	Sewer Capital Works	2211	22,417	44,180
	2031	1.98	Sewer Capital Works	2690	328,283	-
					\$ 2,473,498	\$ 2,499,447
Other						
	Temporary		Firehall #1	2851	7,500,000	-
					\$ 7,500,000	\$ -
					\$ 40,340,417	\$ 33,268,668

Debt includes actuarial adjustments, which represent projected earnings on the sinking fund deposits. The actuarial adjustments are \$7,790,295 in 2021 (2020 - \$7,982,649).

District of Squamish

9. Debt (continued)

The principal repayments on long-term debt required in each of the five years and thereafter are as follows:

	2022	2023	2024	2025	2026	2027+	Actuarial Adjustment
General	\$ 9,483,709	\$ 1,739,629	\$ 1,583,673	\$ 1,574,240	\$ 1,442,553	\$ 7,178,878	\$ 5,115,214
Solid Waste	1,143,271	1,132,253	1,116,581	1,116,581	165,801	414,951	408,553
Water	344,200	302,000	276,196	276,196	276,196	1,386,000	1,303,167
Waste Water	242,943	223,026	223,026	134,113	134,113	552,916	963,361
	\$ 11,214,123	\$ 3,396,908	\$ 3,199,476	\$ 3,101,130	\$ 2,018,663	\$ 9,532,745	\$ 7,790,295

Authorized but unissued debt totals \$5,103,190 (2020 - \$6,596,238).

10. Provision for solid waste landfill

The District has ongoing assessments and work performed to determine the timeframe and costs of closure and post closure costs associated with the landfill. The estimates are based on District engineering reports and calculations performed by engineering consultants.

The liability is calculated based on the ratio of cumulative usage to total capacity of the site by volume and the discounted estimated future cash flows associated with closure and post closure activities. An estimate for inflation is incorporated into the calculation. Cash flows are discounted at 2.3% (2020 - 2.76%) per annum and inflation is estimated at 2.91% (2020 - 2.76%) per annum.

The reported liability is based on estimates and assumptions with respect to capacity, usage, and events extending over the remaining life of the landfill.

In 2019, the District completed a vertical expansion of the landfill, increasing its capacity and extending its estimated closure date.

As of December 31, 2021 the total capacity of the landfill after the expansion is estimated at 856,072 cubic meters (2020 - 835,010 cubic meters). The current remaining capacity of the landfill site is estimated at 155,170 cubic meters (2020 - 134,542 cubic meters) which is 18.1% (2020 - 16.1%) of the site's total planned capacity after the expansion.

The total discounted future cash flows for closure and post closure costs are estimated at \$4,737,182 as at December 31, 2021 (2020 - \$4,482,724). The landfill is expected to reach capacity by 2029.

The estimated total net present value of the estimated expenditure for closure and post-closure care is \$5,785,928 of which \$1,048,746 remains to be recognized.

District of Squamish

11. Provision for post-employment benefits

Information regarding the District's obligations for post employment benefits is as follows:

	2021	2020
Liability, beginning of year	\$ 1,452,300	\$ 1,244,500
Current service cost	216,300	214,200
Interest cost	37,300	45,400
Benefit payments	(135,600)	(92,100)
Amortization of net actuarial loss	39,100	40,300
Liability, end of year	\$ 1,609,400	\$ 1,452,300

The District provides future benefits to all of its eligible employees through a Sick Leave Plan, a Full Annual Vacation at Retirement Plan, and a Retirement Pay Plan (collectively as the "Plans"). The Sick Leave Plan entitles employees to twelve sick days per year, based on one day for each month of service, up to a maximum of 150 days for CUPE members and up to a maximum of 140 days for exempt employees. Sick leave benefits can be used by the employee at any point up to their retirement date.

The Full Annual Vacation at Retirement Plan entitles employees to receive full annual vacation or vacation pay on retirement irrespective of the month of retirement. This benefit would be paid out in full to the employee upon their retirement. The Retirement Pay Plan entitles an employee to two days pay for CUPE members and three days pay for exempt employees at the employee's normal rate of pay for each year or part of year worked. The benefit would be paid out in full to the employee upon their retirement.

There were no amendments to the above Plans during the year ended December 31, 2021.

Actuarial gains and losses are amortized over fourteen years (2020 - fourteen years), being the expected average remaining service period of the related employee group, commencing the year after the gain or loss arises.

	2021	2020
Accrued benefit obligation, end of year	\$ 1,955,900	\$ 1,922,300
Unamortized loss	(346,500)	(470,000)
Liability, end of year	\$ 1,609,400	\$ 1,452,300

The most recent actuarial valuation of the District's employee future benefits was completed as at December 31, 2019 (projected to 2021). The significant actuarial assumptions adopted in measuring the District's accrued benefit obligation are as follows:

	2021	2020
Discount rates	2.40%	1.90%
Expected wage and salary increases	2.5 to 3.5%	2.5 to 3.5%

District of Squamish

12. Accumulated surplus

	2021	2020
Unappropriated surplus	\$ 6,897,371	\$ 5,415,191
Appropriated surplus		
Non-statutory reserves	11,156,969	10,231,589
Statutory reserves	52,716,852	50,679,085
	70,771,192	66,325,865
Investment in tangible capital assets	289,128,896	281,342,640
	\$ 359,900,088	\$ 347,668,505

The unappropriated surplus is the amount of accumulated surplus remaining after deducting the other accumulated surplus components. It is available to temporarily finance activities until planned revenues and borrowing proceeds are received.

Appropriated surplus is the amount of accumulated surplus, supported by a portion of the District's cash and receivables, that has been set aside by decision of Council for a specified purpose. The statutory reserves have been established by bylaw in accordance with the Community Charter and their use is restricted by the legislation. In the normal course of operations, these funds will be used to finance the future services or capital works for which they have been appropriated and can be employed for emergency expenditures and, if included in the annual financial plan bylaw, employed to stabilize taxation and utility fee rates.

Investment in tangible capital assets is equal to the net book value of the tangible capital asset, less related long term debt. In the normal course of operations, the tangible capital assets will be consumed / used to provide services and the debt repaid by future period revenues.

District of Squamish

13. Commitments and contingencies

(a) Litigation

The District is currently involved in certain legal actions and other existing conditions involving uncertainty. Financial implications of potential claims against the District, resulting from such litigation, and that are not covered by insurance, are accrued to the extent that amounts can be reasonably estimated.

As at December 31, 2021, there were legal claims in various stages of litigation for which management is unable to determine the outcome. The outstanding claims are not expected to result in a material loss to the District. As such, no provision has been made in the financial statements for these claims. Losses, if any, resulting from these actions will be recorded in the period the loss becomes likely and can be reasonably estimated.

(b) Municipal Pension Plan

The District and its employees contribute to the Municipal Pension Plan (a jointly trustee pension plan). The board of trustees, representing plan members and employers, is responsible for administering the plan, including investment of assets and administration of benefits. The plan is a multi-employer defined benefit pension plan. Basic pension benefits are based on a formula. As at December 31, 2021, the plan has about 220,000 active members and approximately 112,000 retired members. Active members include approximately 42,000 contributors from local governments.

Every three years, an actuarial valuation is performed to assess the financial position of the plan and adequacy of plan funding. The actuary determines an appropriate combined employer and member contribution rate to fund the plan. The actuary's calculated contribution rate is based on the entry age normal cost method, which produces the long-term rate of member and employer contributions sufficient to provide benefits for average future entrants to the plan. This rate may be adjusted for the amortization of any actuarial funding surplus and will be adjusted for the amortization of any unfunded actuarial liability.

The most recent actuarial valuation for the Municipal Pension Plan as at December 31, 2018, indicated a \$2,866 million funding surplus for basic pension benefits on a going concern basis. The District paid \$1,704,480 for employer contributions to the plan in fiscal 2021 (2020 - \$1,531,938). The next valuation will be as at December 31, 2021, with results available in 2022.

Employers participating in the plan record their pension expense as the amount of employer contributions made during the fiscal year (defined contribution pension plan accounting). This is because the plan records accrued liabilities and accrued assets for the plan in aggregate, resulting in no consistent and reliable basis for allocating the obligation, assets and cost to individual employers participating in the plan.

(c) Demand notes

The District issues its debt instruments through the MFA. These demand notes are contingent in nature and are not reflected in the consolidated financial statements.

District of Squamish

Commitments and Contingencies (continued)

(d) Squamish Oceanfront front ender and municipal share agreements

As permitted under the Local Government Act, the District entered into a Development Cost Charge ("DCC") Front Ender Agreement and Municipal Share Agreements in 2015 for specified off-site infrastructure projects necessary for the development of Oceanfront Lands sold to Matthews Southwest and Bethel Lands Corporation (The Developer) in 2014.

The Agreements provide for the reimbursement of a maximum of \$33,915,438 over a 20 year period for specified DCC projects that the Developer pays for and builds on behalf of the District. Within the agreements there are conditions and restrictions that may limit the reimbursement paid by the District. A key restriction is that reimbursement for most of the specified projects may not exceed 78% of DCC collections received by the District per quarter, during the time when invoices are outstanding. Further, any amounts outstanding at the end of the 20 year term are forgiven.

Only projects identified in the Municipal Share Agreements are eligible for reimbursement of the municipal share portions of the project and only at the time of project completion. The District has discretion to fund and build any project identified in the Agreements and the Developer is not bound to proceed with development activities.

14. Financial Plan

For 2021, the financial plan amounts presented throughout the consolidated financial statements are based on the budget (referred to as the Financial Plan bylaw 2804, 2021 in the legislation) adopted by Council on March 2, 2021. The financial plan does not include certain revenues for transfers from reserves and internal sources, and debt proceeds. The financial plan amounts are presented on a consolidated basis and include civic corporations.

The District's financial plan does not incorporate the operation of its two controlled civic corporations: SPL and SSC. The following reconciles the District's financial plan to the budget figures as presented on the financial statements

	Financial Plan	Adjustments	As Presented
<u>Revenues</u>			
Departmental revenues	\$ 57,592,741	\$ 460,395	\$ 58,053,136
<u>Expenses</u>			
Departmental expenses	56,786,164	373,400	\$ 57,159,564
Annual surplus before other	<u>\$ 806,577</u>	<u>\$ 86,995</u>	<u>\$ 893,572</u>
Other	13,890,750	-	\$ 13,890,750
Annual Surplus	<u>\$ 14,697,327</u>	<u>\$ 86,995</u>	<u>\$ 14,784,322</u>

District of Squamish

15. Taxation and utility revenues

Collection for District

The following shows the collections in 2021 for District purposes, including applicable civic corporations:

	Financial Plan	2021	2020
Taxation			
General property levies	\$ 32,001,700	\$ 31,390,032	\$ 30,059,221
Business improvement area	91,570	93,823	93,825
	32,093,270	31,483,855	30,153,046
Other property levies			
Grants-in-lieu of property levies	725,100	782,309	777,232
Hotel tax	180,000	382,872	286,662
1% utility revenue	294,830	304,657	295,841
Penalties and interest on property levies	300,000	296,852	225,107
	1,499,930	1,766,690	1,584,842
	33,593,200	33,250,545	31,737,888
Utility user fees			
Solid waste	5,013,900	5,458,764	4,818,918
Water	4,963,000	5,464,349	5,157,467
Waste water	6,250,000	6,945,874	6,534,642
	16,226,900	17,868,987	16,511,027
	\$ 49,820,100	\$ 51,119,532	\$ 48,248,915

Collection for other agencies

The following amounts were collected on behalf of other taxing authorities, and are not included on the District's Consolidated Statement of Operations:

	2021	2020
Province of BC School Taxes	\$ 14,706,247	\$ 10,586,233
BC Assessment Authority	470,030	436,001
Municipal Finance Authority	2,100	1,908
Squamish-Lillooet Regional District	1,989,362	1,854,764
Sea to Sky Regional Hospital District	345,506	278,752
	\$ 17,513,245	\$ 13,157,658

District of Squamish

16. Government transfers and other contributions

	2021	2020
Operating		
Federal	\$ 1,850,248	\$ 876,814
Provincial	959,049	4,395,409
Other	203,031	160,410
Total operating	3,012,328	5,432,633
Capital		
Provincial	\$ 877,610	\$ 262,732
Other	14,500	55,000
Total capital	892,110	317,732
	\$ 3,904,438	\$ 5,750,365

17. Trusts

The District trust funds account for assets that must be administered as directed by agreement or statute for certain beneficiaries. In accordance with PSAS, trust funds are not included in the District's consolidated financial statements.

The District operates the Mount Garibaldi Cemetery and maintains the Cemetery Care Fund in accordance with the Cemeteries and Funeral Services Act. The following trust funds are administered by the District and are excluded from these consolidated financial statements.

Cemetery Care Fund financial position as at December 31, 2021:

	2021	2020
Financial Assets		
Investments	\$ 277,188	\$ 261,181
Liabilities		
Cemetery care fund	\$ 277,188	\$ 261,181

District of Squamish

18. Segmented information

The District is a diversified municipal government that provides a wide range of services to its citizens, including General Government, Protective Services, Transportation and Transit, Economic and Community Development, Recreation, Parks, Trails and Library, Public Health, Water, Waste Water, and Solid Waste Utilities. For management reporting purposes, the District's operations and activities are organized and reported by Fund. Funds were created for the purpose of recording specific activities to attain certain objectives in accordance with special regulations, restrictions, or limitations.

Municipal services are provided by departments and their activities reported within these funds. Certain functions that have been separately disclosed in the segmented information, along with the services they provide, are as follows:

General Government

General government and fiscal services is comprised of Council and the related support services provided by the Administration and Finance departments, as well as all operations and maintenance costs relating to Municipal Hall and grants to community organizations.

Protective Services

Protective Services is comprised of police, fire, emergency management planning, bylaw enforcement, animal control, and building inspection.

Transportation and Transit

Transportation and Transit is a broad function comprised of engineering departments and the public works crews engaged in the maintenance and improvements to the road systems, drainage, sidewalks, flood protection, fleet maintenance, works yard maintenance, and other planning and maintenance activities. In addition, this function includes transit services and airport operations.

Economic and Community Development

Economic and Community Development is comprised of planning and land use development, environmental planning, economic development and events management with the common goal of developing Squamish into a healthy, vibrant, and economically viable community. In addition, the District's civic corporation, Squamish Sustainability Corporation have been consolidated into this function for reporting purposes.

Recreation, Parks, Trails and Library

Recreation, Parks, Trails, and Library is comprised of the arena and community centre, seniors centre, youth centre, and an extensive networks of parks and trail systems throughout the community. In addition, the District's civic corporation, the Squamish Public Library, has been consolidated into this function for reporting purposes.

Public Health

Public health service is comprised of the municipal cemetery services.

Water and Waste Water Utilities

The water and waste water utilities is comprised of the water and waste water system networks, storm mains, and pump stations.

Solid Waste Utility

The solid waste utility is comprised of garbage, recycling, organic waste collection services as well as the operation of the landfill.

19. COVID - 19

On January 30, 2020, the World Health Organization ("WHO") announced a global health emergency because of a new strain of coronavirus (the "COVID-19 outbreak") and the risks to the international community as the virus spreads globally beyond its point of origin. On March 11, 2020, the COVID-19 outbreak was declared a global pandemic by the WHO.

As the impacts of COVID-19 continue, there could be further effects on the District, its funders, and its vendors. The District has continued to deliver essential services throughout the pandemic. Management is actively monitoring the effect on its financial condition, liquidity, operations, and workforce. Given the daily evolution of the COVID-19 outbreak and the global responses to curb its spread, the District is not able to fully estimate the effects of the COVID-19 outbreak on its results of operations, financial conditions, or liquidity at this time.

District of Squamish
Schedule 1 - Tangible capital assets

For the year ended December 31, 2021	Land	Land Improvements	Buildings	Furniture, Vehicles and Equipment	Transportation Infrastructure	Solid Waste Infrastructure	Water Infrastructure	Waste Water Infrastructure	Assets under Construction	2021 Actual
Opening Balance	\$ 71,514,575	\$ 45,807,148	\$ 42,038,150	\$ 21,424,383	\$ 108,424,550	\$ 12,821,031	\$ 67,912,089	\$ 67,377,036	\$ 8,945,570	\$ 446,264,532
Add: Additions	372,812	584,162	955,297	3,324,487	5,333,186	675,486	1,413,313	729,546	15,024,673	28,412,962
Less: Disposals	-	-	(553,189)	(435,270)	(20,596)	-	-	-	-	(1,009,055)
Add: Transfers	-	-	-	-	-	-	-	-	(2,820,049)	(2,820,049)
Closing Balance	71,887,387	46,391,310	42,440,258	24,313,600	113,737,140	13,496,517	69,325,402	68,106,582	21,150,194	470,848,390
ACCUMULATED AMORTIZATION										
Opening Balance	-	10,127,641	20,645,026	10,823,472	41,706,744	3,194,335	21,094,880	24,061,126	-	131,653,224
Add: Amortization	-	1,120,358	983,399	1,834,860	2,775,122	1,168,672	1,219,931	1,325,253	-	10,427,595
Less: Accumulated Amortization on Disposals	-	-	(257,210)	(423,935)	(20,596)	-	-	-	-	(701,741)
Closing Balance	-	11,247,999	21,371,215	12,234,397	44,461,270	4,363,007	22,314,811	25,386,379	-	141,379,078
Net Book Value, year ended 2021	\$ 71,887,387	\$ 35,143,311	\$ 21,069,043	\$ 12,079,203	\$ 69,275,870	\$ 9,133,510	\$ 47,010,591	\$ 42,720,203	\$ 21,150,194	\$ 329,469,312

District of Squamish
Schedule 2 - Tangible capital assets

For the year ended December 31, 2020		Land	Land Improvements	Buildings	Furniture, Vehicles and Equipment	Transportation Infrastructure	Solid Waste Infrastructure	Water Infrastructure	Waste Water Infrastructure	Assets under Construction	2020 Actual
Opening Balance	\$ 61,346,098	\$ 35,932,333	\$ 41,756,619	\$ 19,782,814	\$ 92,793,955	\$ 11,778,487	\$ 60,995,656	\$ 60,006,637	\$ 9,486,192	\$ 393,658,791	
Add: Additions	10,168,477	9,874,815	281,531	2,119,922	15,630,595	1,042,544	6,916,433	7,370,399	4,455,305	57,860,021	
Less: Disposals	-	-	-	(478,353)	-	-	-	-	-	(478,353)	
Add: Transfers	-	-	-	-	-	-	-	-	-	(4,904,678)	
Less: Writedowns	-	-	-	-	-	-	-	-	-	(71,249)	
Closing Balance	71,514,575	45,807,148	42,038,150	21,424,383	108,424,550	12,821,031	67,912,089	67,377,036	8,945,570	446,264,532	
ACCUMULATED AMORTIZATION											
Opening Balance	-	9,277,679	19,798,026	9,666,027	39,311,652	2,075,042	20,002,382	22,909,010	-	-	123,039,818
Add: Amortization	-	849,962	847,000	1,630,050	2,395,092	1,119,293	1,092,498	1,152,116	-	-	9,086,011
Less: Accumulated Amortization on Disposals	-	-	-	(472,605)	-	-	-	-	-	-	(472,605)
Closing Balance	-	10,127,641	20,645,026	10,823,472	41,706,744	3,194,335	21,094,880	24,061,126	-	-	131,653,224
Net Book Value, year ended 2020	\$ 71,514,575	\$ 35,679,507	\$ 21,393,124	\$ 10,600,911	\$ 66,717,806	\$ 9,626,696	\$ 46,817,209	\$ 43,315,910	\$ 8,945,570	\$ 314,611,308	

District of Squamish
Schedule 3 - Statement of Operations by Segment

	For the year ended December 31										
	10	20	30	40	50	60	70	80	90	2021	2020
	General Government	Protective Services	Transportation & Transit	Economic & Community Development	Parks Recreation Culture	Health Social & Housing	Solid Waste Management	Water Services	Waste Water Services		
Revenue											
Taxation (Note #15)	\$ 31,483,855	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 30,153,046
Other property levies (Note #15)	1,383,818	-	-	382,872	-	-	-	-	-	1,766,690	1,584,842
Utility user fees (Note #15)	-	-	-	-	-	-	5,458,764	5,468,216	6,942,007	-	16,511,027
Other revenue from own sources	35,149	78,846	711,761	459,485	604,465	60,559	-	-	-	1,950,265	1,368,882
Other fees and charges	467,861	2,663,725	168,612	766,786	94,313	7,785	281,303	44,958	9,850	4,505,193	3,850,634
Government transfers for operating (Note #16)	1,897,456	365,620	277,456	152,070	107,226	212,500	-	-	-	3,012,328	5,432,633
Investment income	1,422,271	-	-	-	2,594	-	17,366	87,052	142,022	1,671,245	1,797,361
	36,690,410	3,108,191	1,157,829	1,761,213	808,538	280,844	5,757,433	5,600,226	7,093,879	62,258,563	60,698,425
Expenses											
Payroll and benefits	6,788,364	4,633,213	3,648,094	2,110,493	4,309,642	30,005	222,561	851,114	821,324	23,414,810	20,683,461
Operating Expenses	2,527,594	7,466,216	2,052,113	1,396,308	2,184,165	284,808	4,571,637	1,583,862	2,585,538	24,652,241	21,205,157
Debt service - interest	371,133	83,159	49,719	136,221	8,804	-	96,649	176,970	159,320	1,081,975	1,070,576
Amortization expense	6,606,743	-	-	7,274	99,722	-	1,168,672	1,219,931	1,325,253	10,427,595	9,086,011
	16,293,834	12,182,588	5,749,926	3,650,296	6,602,333	314,813	6,059,519	3,831,877	4,891,435	59,576,821	52,045,205
Annual surplus (deficit) before Other	20,396,576	(9,074,397)	(4,592,097)	(1,889,083)	(5,793,795)	(33,969)	(302,086)	1,768,349	2,202,444	2,681,942	8,653,220
Other											
Government transfers for capital (Note #16)	-	-	852,593	35,017	4,500	-	-	-	-	892,110	317,732
Developer cost charge capital revenues	-	-	1,054,506	-	-	-	-	78,528	273,300	1,406,334	596,148
Developer contributed assets	2,222,907	71	-	4,530,694	-	-	-	397,148	223,541	7,374,361	39,116,791
Gain on disposal of tangible capital assets	(237,846)	-	-	-	(12,406)	-	-	-	-	(250,252)	549,235
Capital Connections	-	-	-	-	-	-	-	50,504	14,172	64,676	74,609
Other Capital revenues	-	9,576	20,495	-	20,921	-	-	720	10,700	62,412	349,750
	1,985,061	9,647	1,927,594	4,565,711	13,015	-	-	526,900	521,713	9,549,641	41,004,265
Annual Surplus (Deficit)	\$ 22,381,637	\$ (9,064,750)	\$ (2,664,503)	\$ 2,676,628	\$ (5,780,780)	\$ (33,969)	\$ (302,086)	\$ 2,295,249	\$ 2,724,157	\$ 12,231,583	\$ 49,657,485

District of Squamish
 Schedule 4 - Continuity of reserves

Reserve Fund Transactions	Balance, beginning of year	Contributions	Investment income	Expenditures	Transfers	Balance, end of year 2021	Balance, end of year 2020
Sinking Fund Surplus - General	\$ 294,005	\$ -	3,850	\$ -	-	\$ 297,855	\$ 294,005
Sinking Fund Surplus - Water	624,635	-	8,190	-	-	632,825	624,635
Sinking Fund Surplus - Waste Water	733,677	-	9,620	-	-	743,297	733,677
Land Reserve	11,847,158	-	144,920	(2,066,908)	(90,000)	9,835,170	11,847,158
Equipment Replacement	6,320,672	952,000	85,540	(540,780)	-	6,817,432	6,320,672
Community Works Fund	4,786,229	1,793,456	59,210	(2,331,158)	-	4,307,737	4,786,228
Capital Rehab - General	6,325,473	1,289,700	88,030	(508,203)	(270,800)	6,924,200	6,325,472
Capital Rehab - Water	5,243,834	2,415,000	94,810	(1,044,785)	1,000,000	7,708,859	5,243,834
Capital Rehab - Waste Water	9,930,806	3,055,000	139,210	(3,041,585)	(183,077)	9,900,354	9,930,805
Capital Rehab - Solid Waste	1,926,421	-	24,910	(51,612)	(30,000)	1,869,719	1,926,420
Municipal Off-Street Parking Facilities Reserve Fund	555,662	75,000	7,770	-	-	638,432	555,662
Alternative Forms of Transportation Reserve Fund	332,910	630,000	8,490	-	-	971,400	332,910
Affordable Housing	1,275,047	-	16,710	-	-	1,291,757	1,275,047
Carbon Neutral	165,813	35,604	2,330	(11,050)	-	192,697	165,813
Vanoc Legacy	7,600	-	100	-	-	7,700	7,600
Parkland in Lieu	41,648	-	550	-	-	42,198	41,649
Corridor Trail MOU	210,689	-	3,650	-	-	214,339	210,689
Environmental Reserve Fund	-	135,694	-	-	-	135,694	-
General Operating Reserve	56,809	524,500	172,770	(457,242)	(111,650)	185,187	56,809
Total	\$ 50,679,088	\$ 10,905,954	\$ 870,660	\$ (10,053,323)	\$ 314,473	\$ 52,716,852	\$ 50,679,085

District of Squamish
Consolidated Financial Statements
For the year ended December 31, 2022



District of Squamish

December 31, 2022

Management's Responsibility for Financial Reporting

The Council of the District of Squamish (the "District") has delegated the responsibility for the integrity and objectivity of the financial information contained in the consolidated financial statements to the management of the District. The consolidated financial statements which, in part, are based on informed judgements and estimates, have been prepared by management in accordance with Canadian public sector accounting standards, which have been applied on a basis consistent with that of the preceding year.

To assist in carrying out their responsibility, management maintains an accounting system and internal controls to provide reasonable assurance that transactions are executed and recorded in accordance with authorization, and that financial records are reliable for preparation of financial statements.

The Mayor and Council oversee management's responsibilities for the financial reporting and internal control systems. Council annually reviews and approves the consolidated financial statements.

The District's independent auditors, BDO Canada LLP, are engaged to express an opinion as to whether these consolidated financial statements present fairly the District's consolidated financial position, operations, and cash flows in accordance with Canadian public sector accounting standards. Their opinion is based on procedures they consider sufficient to support such an opinion in accordance with Canadian generally accepted auditing standards,

The consolidated financial statements have, in management's opinion, been properly prepared within reasonable limits of materiality and in accordance with Canadian public sector accounting standards.

Heather Boxrud, MBA, CPA, CGA

Chief Financial Officer

May 8, 2023



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Independent Auditor's Report

To the Mayor and Councillors of the District of Squamish

Opinion

We have audited the accompanying consolidated financial statements of the District of Squamish and its controlled entities (the "District"), which comprise the Consolidated Statement of Financial Position as at December 31, 2022, the Consolidated Statements of Operations and Accumulated Surplus, Change in Net Financial Assets, and Cash Flows for the year then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the District as at December 31, 2022, and the results of its operations, change in net financial assets, and cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally-accepted auditing standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Consolidated Financial Statements* section of this report. We are independent of the District in accordance with the ethical requirements that are relevant to our audit of the consolidated financial statements in Canada and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the District's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the District or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the District's financial reporting process.

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.



Auditor's Responsibilities for the Audit of the Consolidated Financial Statements (Continued)

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the District's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the District to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the District to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

BDO Canada LLP

Chartered Professional Accountants

Whistler, British Columbia
May 8, 2023

District of Squamish
Consolidated Statement of Financial Position

For the year end December 31

2022

2021

Financial Assets

Cash and cash equivalents (Note #3)	\$ 109,090,004	\$ 114,358,717
Investments (Note #4)	5,506,016	8,503,561
Accounts receivable (Note #5)	7,873,619	5,371,836
Debenture deposits (Note #6)	716,523	712,152
Security deposits	10,000	-
	<u>123,196,162</u>	<u>128,946,266</u>

Liabilities

Accounts payable, accrued and other liabilities (Note #7)	22,086,930	23,494,236
Deferred revenue (Note #8)	7,701,137	6,425,327
Development cost charges (Note #9)	19,267,070	22,917,514
Debt (Note #10)	37,870,347	40,340,417
Provision for solid waste landfill (Note #11)	5,449,955	4,737,182
Provision for post-employment benefits (Note #12)	1,705,800	1,609,400
	<u>94,081,239</u>	<u>99,524,076</u>

Net Financial Assets

	<u>29,114,923</u>	<u>29,422,190</u>
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Non-Financial Assets

Tangible capital assets (Schedules 1 and 2)	347,654,859	329,469,312
Inventories	654,461	489,615
Prepaid expenses	192,461	518,971
	<u>348,501,781</u>	<u>330,477,898</u>

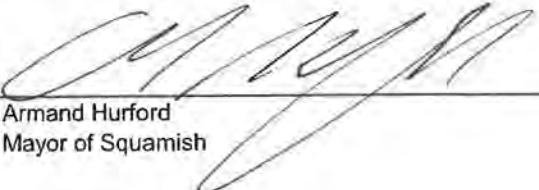
Accumulated Surplus (Note #13)

	<u>\$ 377,616,704</u>	<u>\$ 359,900,088</u>
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Commitments and contingencies (Note #14)



Heather Boxrud, MBA, CPA, CGA
Chief Financial Officer



Armand Hurford
Mayor of Squamish

District of Squamish

Consolidated Statement of Operations and Accumulated Surplus

For the year end December 31	Financial Plan 2022 (Note #15)	2022	2021
Revenue (Schedule 3)			
Taxation (Note #16)	\$ 34,256,570	\$ 33,932,364	\$ 31,483,855
Other property levies (Note #16)	1,532,930	2,492,460	1,766,690
Utility user fees (Note #16)	18,373,300	18,999,487	17,868,987
Other revenue from own sources	2,105,458	1,874,292	1,950,265
Other fees and charges	4,237,381	5,797,106	4,505,193
Government transfers for operating (Note #17)	3,025,935	1,854,032	3,012,328
Investment income	1,831,620	3,307,362	1,671,245
	<u>65,363,194</u>	<u>68,257,103</u>	<u>62,258,563</u>
Expenses (Schedule 3)			
General Government	17,186,754	18,315,287	16,293,834
Protective Services	12,237,487	11,174,094	12,182,588
Transportation & Transit	6,717,160	6,316,547	5,749,926
Economic & Community Development	4,039,026	3,962,885	3,650,296
Parks, Recreation & Culture	6,991,297	6,741,984	6,602,333
Health, Social & Housing	581,722	292,855	314,813
Solid Waste Management	6,564,902	6,578,362	6,059,519
Water Services	3,978,071	3,979,303	3,831,877
Waste Water Services	5,518,081	5,418,291	4,891,435
	<u>63,814,500</u>	<u>62,779,608</u>	<u>59,576,621</u>
Annual surplus before Other	<u>1,548,694</u>	<u>5,477,495</u>	<u>2,681,942</u>
Other			
Government transfers for capital (Note #17)	9,718,100	1,857,732	892,110
Developer cost charge capital revenues	13,885,800	7,363,974	1,406,334
Developer contributed assets	130,000	2,989,212	7,374,361
Loss on disposal of tangible capital assets	-	(40,705)	(250,252)
Capital Connections	-	49,932	64,676
Other Capital revenues	15,000	18,976	62,412
	<u>23,748,900</u>	<u>12,239,121</u>	<u>9,549,641</u>
Annual Surplus	<u>25,297,594</u>	<u>17,716,616</u>	<u>12,231,583</u>
Accumulated Surplus, beginning of year	<u>359,900,088</u>	<u>359,900,088</u>	<u>347,668,505</u>
Accumulated Surplus, end of year (Note #13)	<u>\$ 385,197,682</u>	<u>\$ 377,616,704</u>	<u>\$ 359,900,088</u>

District of Squamish
Consolidated Statement of Change in Net Financial Assets

For the year end December 31	Financial Plan 2022 (Note #15)	2022	2021
Annual surplus	\$ 25,297,594	\$ 17,716,616	\$ 12,231,583
Acquisition of tangible capital assets	(86,585,480)	(28,928,707)	(23,119,541)
Contributed tangible capital assets	(130,000)	(622,376)	(2,473,371)
Amortization expense	9,500,000	11,308,558	10,427,595
Loss on disposal of tangible capital assets	-	40,705	250,252
Proceeds on sale of tangible capital assets	-	16,272	57,060
	(77,215,480)	(18,185,548)	(14,858,005)
Other non-financial assets			
Increase in inventories	-	(164,845)	(380,455)
Decrease (increase) in prepaid expenses	-	326,510	(281,467)
	-	161,665	(661,922)
Change in net financial assets	(51,917,886)	(307,267)	(3,288,344)
Net financial assets, beginning of year	29,422,190	29,422,190	32,710,534
Net financial assets (liabilities), end of year	\$ (22,495,696)	\$ 29,114,923	\$ 29,422,190

District of Squamish
Consolidated Statement of Cash Flows

For the year end December 31	2022	2021
Cash provided by (used in)		
Operating transactions		
Annual surplus	\$ 17,716,616	\$ 12,231,583
Non-cash items included in annual surplus		
Amortization	11,308,558	10,427,595
Contributed tangible capital assets	(622,376)	(2,473,371)
Loss on disposal of tangible capital assets	40,705	250,252
Provision for post employment benefits	96,400	157,100
Development cost charges revenue recognized	(7,363,974)	(1,406,334)
Actuarial adjustment on debt	(923,634)	(795,666)
Provision for landfill closure	712,773	254,458
Changes in other non-cash working capital	(2,485,985)	4,815,499
	18,479,083	23,461,116
Investing transactions		
Proceeds from investments maturing	2,997,545	7,014,510
Capital transactions		
Acquisition of tangible capital assets	(28,928,707)	(23,119,541)
Proceeds from sale of tangible capital assets	16,272	57,060
	(28,912,435)	(23,062,481)
Financing transactions		
Development cost charges received, including interest	3,713,530	2,240,157
Proceeds (repayment) of the short-term portion of debt	(7,500,000)	7,500,000
Proceeds of the long-term portion of debt	9,695,598	3,856,362
Debt principal repaid	(3,721,794)	(3,469,939)
Capital leases	(20,240)	(19,008)
	2,167,094	10,107,572
Increase (decrease) in cash	(5,268,713)	17,520,717
Cash and cash equivalents, beginning of year	114,358,717	96,838,000
Cash and cash equivalents, end of year (Note #3)	\$ 109,090,004	\$ 114,358,717
Supplemental information:		
Interest paid	\$ 1,302,152	\$ 1,081,975

Notes to the Consolidated Financial Statements

December 31, 2022

The Notes to the Consolidated Financial Statements ("Notes") are an integral part of the financial statements. The following explains the significant accounting policies and reporting principles underlying these statements. The Notes also provide relevant supplementary information and explanations.

1. Status of The District of Squamish

The District of Squamish (the "District") is a municipality that was incorporated on December 15, 1964 pursuant to the Municipal Act and subsequently continued under the Local Government Act, a statute of the Legislature of the Province of British Columbia (the "Province"). The District is subject to the provisions of the Community Charter and legislation under the Province. The District's principal activity is providing property tax funded services such as general government, protective (police and fire), transportation, economic and community development, and parks and recreation. The District provides public utilities for solid waste, water, and waste water services. The District also operates a cemetery and an aquatic centre (facility is owned and governed by the Squamish-Lillooet Regional District) and provides the community with library and other services.

2. Significant accounting policies

The consolidated financial statements have been prepared by management in accordance with Canadian public sector accounting standards ("PSAS"). The significant accounting policies are summarized below:

Basis of consolidation

The consolidated financial statements include the assets, liabilities, reserves, surpluses/deficits, revenues, and expenses of those District funds and government functions or entities which have been determined to comprise a part of the aggregate District operations based upon control exercised by the District. Inter-fund and inter-corporate balances and transactions have been eliminated.

I) Consolidated entities

The organizations (referred to as subsidiaries or civic corporations) included in the consolidated financial statements are as follows:

Squamish Public Library ("SPL"), which was incorporated without share capital as a municipal library of the District on May 15, 2003.

Squamish Sustainability Corporation ("SSC"), which was incorporated with the District as the sole shareholder on October 13, 2005.

II) Squamish District Community Pool

The Squamish-Lillooet Regional District ("SLRD") has contracted with the District to provide aquatic centre ("Squamish District Community Pool") recreational services. The District provides the programs and services at the Squamish District Community Pool on behalf of the SLRD. This facility was established and constructed under authority of the SLRD Service Area Establishment Bylaw 438. The related assets, liabilities, revenues, and expenses are reported in the SLRD financial statements, as the taxing authority and owner of the facility. Therefore, the District does not include any portion of the Squamish District Community Pool financial position or operations in the consolidated financial statements.

Basis of accounting

The consolidated financial statements are prepared using the accrual basis of accounting. The accrual basis of accounting records revenue as it is earned and measurable. Expenses are recognized as they are incurred and measurable based upon receipt of goods or services and / or the creation of a legal obligation to pay.

District of Squamish

Significant accounting policies (continued)

I) Fund accounting

As a local government, the District uses fund accounting. The resources and operations of the District have been segregated for accounting and financial reporting purposes into the following funds, which are presented as supplementary information: General, Solid Waste, Water, and Waste Water.

II) Segment disclosure

The District segregates its operations for financial reporting based upon group of activities / services. A segment is defined as a distinguishable activity or group of activities / services of a government for which it is appropriate to separately report financial information. The District provides this additional segment information in Schedule 3.

Deferred revenue

Government transfers, contributions and other amounts are received from third parties pursuant to legislation, regulation, or agreement. They may only be used in the conduct of certain programs, in the completion of specific work, or for the acquisition and construction of tangible capital assets.

Development Cost Charges

Development cost charges ("DCC") are collected for which the related services or capital costs have yet to be performed. Revenue is recognized in the period when the related expenses (such as development costs) are incurred, services performed, or the tangible capital assets are acquired.

Debt

Debt is recorded at cost net of principal repayments and actuarial adjustments in accordance with the Municipal Finance Authority of British Columbia ("MFA").

Contaminated sites

Governments are required to accrue a liability for the costs to remediate a contaminated site. The District recognizes a liability, at the estimated net present value of remediation cost, when an environmental standard exists, contamination exceeds the standard, the government has responsibility for remediation, future economic benefits will be given up, and a reasonable estimate can be made.

Solid waste landfill

The obligation of closure and post-closure costs associated with the solid waste landfill site is based on the present value of estimated future expenses which is recorded as a liability.

Employee future benefits

The District and its employees make contributions to the Municipal Pension Plan ("MPP"). These District contributions are expensed as incurred.

For post-employment benefits, the District accrues for the employees' Sick Leave Plan, Full Annual Vacation at Retirement Plan, and the Retirement Pay Plan. The liabilities related to these benefits are actuarially determined based on period of service and best estimates of retirement ages and expected salaries. The liabilities under these benefit plans are accrued based on projected benefits as the employees render services necessary to earn the future benefits. Actuarial gains and losses are amortized over the expected average remaining service period of the related employee group, commencing the year after the gain or loss arises.

Non-Financial assets

Non-financial assets are held for use in the provision of goods and services but are not available to discharge existing liabilities. These assets may have a useful life extending beyond the current year and are not intended for sale in the ordinary course of operations.

District of Squamish

Significant accounting policies (continued)

Intangible assets, such as water rights and mineral resources, unless acquired by the District through an arm's length exchange transaction, are not recorded in the financial statements.

Tangible capital assets

Tangible capital assets are recorded at cost which includes amounts that are directly attributable to the acquisition, construction, development, or betterment of the assets. The cost, less residual value, of the tangible capital assets (excluding land) is amortized on a straight-line basis over their estimated useful life as follows:

Fund	Asset Category	Useful Life Range (years)
General	Land	n/a
	Land improvements	5 to 200
	Buildings	5 to 60
	Furniture, vehicles, and equipment	3 to 40
	Transportation infrastructure	5 to 100
Solid Waste	Solid waste infrastructure	12 to 50
Water	Water infrastructure	5 to 100
Waste Water	Waste water infrastructure	5 to 100

Tangible capital assets, including assets under construction, are recorded at cost. Amortization is charged over the asset's useful life in a rational and systematic manner, considering cost less any residual value. Assets under construction are not amortized. When assets are substantially complete and available for use, they cease to be classified as assets under construction and their period of amortization begins.

Contributed tangible capital assets are recognized at fair value (using various methods including actual developer costs, appraisals, assessed values, or professional estimations) at the date of contribution and are also recognized as revenue. Where an estimate of fair market value cannot be made, the tangible capital asset is recognized at nominal value.

Leases are classified as capital or operating leases. Leases which transfer substantially all of the benefits and risks incidental to ownership of property are classified as capital, and the related assets are accounted for as tangible capital assets. All other leases are classified as operating leases and the related lease payments are charged to expenses as incurred.

Interest expenditures incurred for assets under construction are expensed and not capitalized.

The District's tangible capital assets do not include works of art and historical treasures because a reasonable estimate of the future benefits associated with such property cannot be made.

Inventories

Inventories are recorded at the lower of cost and replacement cost. Donated materials are initially recorded at their fair market value, if determinable, and subsequently at the lower of cost and replacement cost.

Tax revenues

Taxes are levied to provide revenue to the District for the provision of public services. Tax revenues are recognized as revenue in the year they are levied as the tax revenues result from non-exchange transactions that are compulsorily paid to local governments in accordance with the established laws and regulations. The tax revenues include levies on behalf of consolidated entities, business improvement area(s), and utility frontage taxes.

District of Squamish

Significant accounting policies (continued)

The property tax revenue relies on market assessments of land value that are subject to appeal. Through the British Columbia Assessments appeal process, taxes may be adjusted by way of supplementary roll adjustments. Estimates are made of potential adjustments to taxes. Any additional adjustments required over those estimated are recognized at the time they are awarded.

The District is required by the Province and other taxing authorities to collect and remit levies in respect of properties. The District has no jurisdiction or control over these levies. Therefore, levies imposed by other taxing authorities are not reflected as a District revenue and expense. The funds collected are presented as a payable to the taxing authority.

Government transfers

Government transfers are transfers of monetary assets or tangible capital assets to the District that are not the result of an exchange transaction, a direct financial return, or expected to be repaid in the future. Government transfers, which include legislative grants, are recognized as revenue in the consolidated financial statements when the transfer is authorized and any eligibility criteria have been met, stipulations, if any, have been met, and reasonable estimates of the amounts can be determined.

When transfers include stipulations that gives rise to an obligation that meets the definition of a liability, the transfers are deferred and recognized when the stipulations have been met.

Other revenues

The District recognized other revenues for the provision of utility and other public services.

The utility services include water, waste water, and solid waste. The revenue for water, waste water, and solid waste usage are recorded as user fees. Other utility revenues are recorded for servicing properties such as connection fees, which are recognized when the connection has been established.

Other sales of goods and services include revenue from other government services such as general government, transportation, economic and community development, parks and recreation, and the consolidated civic corporations.

Estimates

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosures of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reported period. Actual results will depend on future economic events and could differ from those estimates. The significant areas requiring management estimates include accrued and other liabilities, provision for landfill closure and post closure costs, provision for post employment benefits, the value of developer contributed assets, and the useful lives of tangible capital assets.

Contingent Liabilities

Liabilities for potential obligations that are contingent on future events are recognized when it is likely that the future event will confirm the existence of the obligation and the amount of the liability can be reasonably estimated. Disclosure for potential obligations that do not meet the threshold is made when the occurrence of the confirming future event is likely but the amount of the liability cannot be reasonably estimated, or the occurrence of the confirming future event is not determinable.

Financial plan

The 2022 financial plan is included on the consolidated statements of operations and accumulated surplus and change in net financial assets. The financial plan is compiled from the District Council approved financial plan bylaw and adjusted for consolidated entities (Note #15).

District of Squamish

3. Cash and cash equivalents

	2022	2021
Cash	\$ 106,209,049	\$ 111,380,620
Cash equivalents	2,714,053	2,786,954
Cash held by civic corporations	166,902	191,143
	\$ 109,090,004	\$ 114,358,717

The District's Operating Account, presented as "Cash" is comprised of deposits at the Bank of Nova Scotia ("BNS") and accrues interest at a rate of the BNS Reference Rate + 0.3% (2021 - BNS Reference Rate + 0.3%)

Cash Equivalents are comprised of BNS " Notice Plan" deposits which accrue interest at a rate of the BNS Reference Rate + 0.35% (2021 - BNS Reference Rate + 0.35%) and requires 20 days notice to liquidate.

4. Investments

	2022	2021
Term Deposits	\$ -	\$ 5,301,886
MFA Mortgage Fund	5,168,669	3,029,684
Investments held by civic corporations	337,347	171,991
	\$ 5,506,016	\$ 8,503,561

The MFA Mortgage Fund is recorded at cost and income distributions are received as additional units of the fund.

5. Accounts receivable

	2022	2021
Property taxes	\$ 2,412,462	\$ 2,093,226
Utilities	1,276,878	1,048,180
Government transfers	1,907,866	526,114
GST	1,005,226	631,174
Trade accounts and other	1,275,654	1,087,679
Allowance for doubtful accounts	(4,467)	(14,537)
	\$ 7,873,619	\$ 5,371,836

The District receives government transfers from senior levels of government, including the Province of British Columbia and the Federal Government of Canada.

The District, as a local government, receives goods and services tax rebates and input tax credits from the Canada Revenue Agency, Government of Canada.

District of Squamish

6. Debenture deposits

The District's debenture deposits are reported by fund as follows:

	2022	2021
General	\$ 473,802	\$ 469,566
Solid waste	73,610	73,406
Water	82,048	82,414
Waste water	87,063	86,766
	\$ 716,523	\$ 712,152

The District issues its debt instruments through the MFA. A portion of the debt proceeds is withheld in the debt reserve fund by the MFA; these are considered District cash deposits and are a condition of the borrowings. These deposits are invested by MFA and earn a return net of expenses. They are refundable upon maturity of the underlying debt.

7. Accounts payable, accrued and other liabilities

	2022	2021
Accrued liabilities and trade liabilities	\$ 13,642,387	\$ 16,161,584
Wages and benefits payable	1,046,034	1,072,870
Accrued interest payable	334,433	232,318
Deposits	7,064,076	6,027,464
	\$ 22,086,930	\$ 23,494,236

8. Deferred revenue

	2022	2021
Prepaid taxes	\$ 1,055,710	\$ 759,607
Prepaid utilities fees	386,855	230,560
Development cash-in-lieu	2,910,202	2,908,053
Deferred government transfers	2,804,723	2,065,258
Other deferred revenue	543,647	461,849
	\$ 7,701,137	\$ 6,425,327

District of Squamish

9. Development Cost Charges

	2022	2021
Development cost charges, beginning of year	\$ 22,917,514	\$ 22,083,691
Contributions	3,001,060	1,947,157
Interest earned	712,470	293,000
Expenditures	(7,363,974)	(1,406,334)
Development cost charges, end of year	\$ 19,267,070	\$ 22,917,514

District of Squamish

10. Debt

Fund	Purpose	By-law	Maturity year	Interest rate	Balance	Additions	Principal Payments	Actuarial Adjustment	2022	2021
					Beginning of Year					
General	Police Building	1679	2022	1.75	374,466	-	148,189	226,277	-	374,466
	Facilities	2137	2022	2.90	64,071	-	45,015	19,056	-	64,071
	General Capital Works	2208	2022	1.95	57,260	-	50,875	6,385	-	57,260
	Facilities	2137	2023	3.85	27,767	-	9,945	3,654	14,168	27,767
	General Capital Works	2166	2023	3.85	103,029	-	36,903	13,601	52,525	103,029
	General Capital Works	2208	2023	3.85	99,290	-	35,564	13,108	50,618	99,290
	Synthetic Turf Field	2214	2023	3.85	42,104	-	15,081	5,558	21,465	42,104
	Fire Equipment	2534	2023	2.90	129,685	-	58,463	5,421	65,801	129,685
	Systems and Equipment	2208	2024	3.00	38,752	-	9,434	2,980	26,338	38,752
	Capital Leases	n/a	2025	n/a	87,077	-	20,240	-	66,837	87,077
	Tantalus Fire Hall Seismic Upgrade	2331	2025	0.91	550,200	-	131,687	2,305	416,208	550,200
	Forestry Building	1917	2026	1.53	908,257	-	93,112	74,577	740,568	908,257
	Business Park	1945	2027	2.25	1,216,675	-	105,925	77,503	1,033,247	1,216,675
	General Capital Works	2166	2027	2.90	640,864	-	67,882	28,735	544,247	640,864
	Fire Rescue Truck	2392	2027	3.15	113,293	-	15,562	1,953	95,778	113,293
	Business Park	2029	2029	2.25	1,436,681	-	97,387	58,533	1,280,761	1,436,681
	Flood Protection	2166	2029	3.00	68,248	-	5,629	1,778	60,841	68,248
	Bridge, Flood Protection, and Arena Lighting	2208	2029	3.00	504,671	-	41,621	13,150	449,900	504,671
	Bridge	2282	2029	3.00	210,007	-	17,320	5,472	187,215	210,007
	Aerial Apparatus	2533	2029	2.24	415,618	-	44,056	2,683	368,879	415,618
	Eagle Run Bridge	2282	2030	2.75	442,164	-	34,692	7,953	399,519	442,164
	Eagle Run Bridge	2331	2030	2.75	36,249	-	2,844	652	32,753	36,249
	ERP System, Arena Slab, Arena Wall Insulation	2392	2030	0.91	1,545,448	-	157,291	2,753	1,385,404	1,545,448
	ERP System	2444	2030	0.91	1,145,990	-	116,636	2,041	1,027,313	1,145,990
	Technology Transformation Project	2600	2030	0.91	972,717	-	99,000	1,733	871,984	972,717
	Technology Transformation Project	2687	2030	0.91	325,825	-	33,161	580	292,084	325,825
	Technology Transformation Project	2687	2031	1.98	1,021,112	-	92,194	-	928,918	1,021,112
	Roads and Drainage	2051	2031	1.47	664,368	-	40,923	15,709	607,736	664,368
	General Capital Works	2051	2031	2.10	400,579	-	30,142	4,801	365,636	400,579
	Arena Roof	2064	2031	1.47	423,697	-	26,098	10,018	387,581	423,697
	Forestry Bldg Roof Top Unit, Cleveland Ave Upgrade	2282	2032	3.15	492,750	-	34,182	4,290	454,278	492,750
	Technology Transformation Project	2774	2032	4.09	-	939,120	-	-	939,120	-
	General Capital Works	2208	2033	3.85	319,717	-	15,548	5,730	298,439	319,717
	Cleveland-Main to Victoria Streetscape	2530	2033	3.20	268,379	-	17,306	1,605	249,468	268,379
	Dike Construction and Rehabilitation	2051	2034	3.00	257,677	-	11,777	3,721	242,179	257,677
	General Capital Works	2051	2035	2.75	77,808	-	3,581	821	73,406	77,808
	Dike Construction and Rehabilitation	2536	2035	0.91	731,970	-	45,793	801	685,376	731,970
	Third Ave Pond Remediation	2599	2035	0.91	546,612	-	34,196	598	511,818	546,612
	Oceanfront R20 Peninsula Main Road	2465	2040	0.91	1,580,672	-	69,628	1,218	1,509,826	1,580,672
	Firehall #1	2777	2041	2.58	2,363,224	-	94,865	-	2,268,359	2,363,224
	Oceanfront R20 Peninsula Main Road	2775	2042	4.09	-	1,018,692	-	-	1,018,692	-
	Firehall #1	2777	2042	4.09	-	7,737,781	-	-	7,737,781	-
					\$ 20,704,973	\$ 9,695,593	\$ 2,009,747	\$ 627,753	\$ 27,763,066	\$ 20,704,973

District of Squamish

10. Debt (continued)

Fund	Purpose	By-law	Maturity year	Interest rate	Balance Beginning of Year	Additions	Principal Payments	Actuarial Adjustment	2022	2021
Solid Waste										
	Landfill Capital Projects	2137	2022	2.90	15,681	-	11,018	4,663	-	15,681
	Landfill Capital Projects	2137	2023	3.85	43,753	-	15,672	5,777	22,304	43,753
	Landfill Capital Projects	2137	2025	2.75	90,403	-	17,448	4,000	68,955	90,403
	Landfill Vertical Expansion	2535	2025	0.91	2,671,495	-	639,406	11,190	2,020,899	2,671,495
	Landfill Vertical Expansion	2691	2025	0.91	1,228,051	-	293,927	5,144	928,980	1,228,051
	Landfill Vertical Expansion	2691	2026	1.25	143,743	-	27,484	-	116,259	143,743
	Landfill Vertical Expansion	2535	2029	2.24	1,304,865	-	138,317	8,424	1,158,124	1,304,865
					<u>\$ 5,497,991</u>	<u>\$ -</u>	<u>\$ 1,143,272</u>	<u>\$ 39,198</u>	<u>\$ 4,315,521</u>	<u>\$ 5,497,991</u>
Water										
	Water Capital Works	2209	2022	1.95	47,496	-	42,199	5,297	-	47,496
	Watermain Replacement	2167	2023	3.85	72,042	-	25,804	9,511	36,727	72,042
	Water Systems	1944	2027	2.25	162,632	-	14,159	10,360	138,113	162,632
	Water Capital Works	2209	2028	3.85	459,711	-	42,529	15,675	401,507	459,711
	Water Systems	2052	2029	2.25	326,300	-	22,119	13,294	290,887	326,300
	PRV, Meters, Stations, and Mains	2167	2029	3.00	123,264	-	10,166	3,212	109,886	123,264
	Watermain Replacement	2209	2029	3.00	214,656	-	17,703	5,593	191,360	214,656
	Watermain Replacement	2283	2029	3.00	542,774	-	44,764	14,142	483,868	542,774
	Watermain Replacement	2283	2030	2.75	127,274	-	9,986	2,289	114,999	127,274
	Water Capital Works	2052	2031	1.47	351,929	-	21,678	8,321	321,930	351,929
	Water Systems	2138	2032	2.90	164,906	-	8,591	3,637	152,678	164,906
	Water Systems	2167	2032	2.90	203,905	-	10,623	4,497	188,785	203,905
	Watermain Replacement	2445	2032	3.15	391,444	-	27,155	3,408	360,881	391,444
	Watermain Replacement	2532	2035	0.91	303,832	-	19,008	333	284,491	303,832
	ICI / Multi- Family Water Meter Installation	2393	2040	0.91	671,790	-	29,592	518	641,680	671,790
					<u>\$ 4,163,955</u>	<u>\$ -</u>	<u>\$ 346,076</u>	<u>\$ 100,087</u>	<u>\$ 3,717,792</u>	<u>\$ 4,163,955</u>
Waste Water										
	Generator, Lift Station Reconstruct	2211	2022	1.95	22,417	-	19,917	2,500	-	22,417
	Waste Water Treatment Plant - Mamquam	1756	2024	2.85	642,450	-	88,913	114,878	438,659	642,450
	Sewer Mains	1977	2028	2.65	285,752	-	21,728	14,451	249,573	285,752
	Sanitary Sewer Trunk Line	2156	2029	3.00	87,986	-	7,256	2,293	78,437	87,986
	Centrifuge, Trunk, Lift Station, and Crane	2211	2029	3.00	164,338	-	13,553	4,282	146,503	164,338
	Centrifuge, Trunk, Lift Station, and Crane	2211	2030	2.75	504,606	-	39,591	9,076	455,939	504,606
	Multi-Functional Heavy Duty Truck	2690	2031	1.98	328,283	-	29,640	-	298,643	328,283
	Trunk Sanitary Sewer Mains	2156	2032	2.90	305,996	-	15,941	6,748	283,307	305,996
	Sewer Capital Works	2168	2033	3.85	131,670	-	6,403	2,360	122,907	131,670
					<u>\$ 2,473,498</u>	<u>\$ -</u>	<u>\$ 242,942</u>	<u>\$ 156,588</u>	<u>\$ 2,073,968</u>	<u>\$ 2,473,498</u>
Other										
	Firehall #1	2851	Temporary		7,500,000	-	7,500,000	-	-	7,500,000
					<u>\$ 7,500,000</u>	<u>\$ -</u>	<u>\$ 7,500,000</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 7,500,000</u>
					<u>\$ 40,340,417</u>	<u>\$ 9,695,593</u>	<u>\$ 11,242,037</u>	<u>\$ 923,626</u>	<u>\$ 37,870,347</u>	<u>\$ 40,340,417</u>

District of Squamish

10. Debt (continued)

The principal repayments on long-term debt required in each of the five years and thereafter are as follows:

	2023	2024	2025	2026	2027	2028+	Actuarial Adjustment	Total
General	\$ 2,156,668	\$ 2,002,109	\$ 1,992,067	\$ 1,838,041	\$ 1,744,929	\$ 10,897,463	\$ 7,131,784	\$ 27,763,061
Solid Waste	1,132,253	1,116,581	1,116,581	165,801	138,317	276,634	369,356	4,315,523
Water	303,876	278,071	278,071	278,071	278,071	1,117,304	1,184,330	3,717,794
Waste Water	223,026	223,026	134,113	134,113	134,113	418,804	806,774	2,073,969
	\$ 3,815,823	\$ 3,619,787	\$ 3,520,832	\$ 2,416,026	\$ 2,295,430	\$ 12,710,205	\$ 9,492,244	\$ 37,870,347

Authorized but unissued debt totals \$25,139,771 (2021 - \$5,103,190).

11. Provision for solid waste landfill

The District has ongoing assessments and work performed to determine the timeframe and costs of closure and post closure costs associated with the landfill. The estimates are based on District engineering reports and calculations performed by engineering consultants.

The liability is calculated based on the ratio of cumulative usage to total capacity of the site by volume and the discounted estimated future cash flows associated with closure and post closure activities. An estimate for inflation is incorporated into the calculation. Cash flows are discounted at 2.54% (2021 - 2.30%) per annum and inflation is estimated at 3.40% (2021 - 2.91%) per annum.

The reported liability is based on estimates and assumptions with respect to capacity, usage, and events extending over the remaining life of the landfill.

As of December 31, 2022 the total capacity of the landfill is estimated at 856,072 cubic meters (2021 - 856,072 cubic meters). The current remaining capacity of the landfill site is estimated at 141,545 cubic meters (2021 - 155,170 cubic meters) which is 16.5% (2021 - 18.1%) of the site's total planned capacity.

The discounted future cash flows for closure and post closure costs are estimated at \$5,449,955 as at December 31, 2022 (2021 - \$4,737,182). The landfill is expected to close in 2030.

The estimated total net present value of the estimated expenditure for closure and post-closure care is \$6,529,569 of which \$1,079,614 remains to be recognized.

District of Squamish

12. Provision for post-employment benefits

Information regarding the District's obligations for post employment benefits is as follows:

	2022	2021
Liability, beginning of year	\$ 1,609,400	\$ 1,452,300
Current service cost	196,900	216,300
Interest cost	47,200	37,300
Benefit payments	(184,000)	(135,600)
Amortization of net actuarial loss	36,300	39,100
Liability, end of year	\$ 1,705,800	\$ 1,609,400

The District provides future benefits to all of its eligible employees through a Sick Leave Plan, a Full Annual Vacation at Retirement Plan, and a Retirement Pay Plan (collectively as the "Plans"). The Sick Leave Plan entitles employees to twelve sick days per year, based on one day for each month of service, up to a maximum of 150 days for CUPE members and up to a maximum of 140 days for exempt employees. Sick leave benefits can be used by the employee at any point up to their retirement date.

The Full Annual Vacation at Retirement Plan entitles employees to receive full annual vacation or vacation pay on retirement irrespective of the month of retirement. This benefit would be paid out in full to the employee upon their retirement. The Retirement Pay Plan entitles an employee to two days pay for CUPE members and three days pay for exempt employees at the employee's normal rate of pay for each year or part of year worked. The benefit would be paid out in full to the employee upon their retirement.

There were no amendments to the above Plans during the year ended December 31, 2022.

Actuarial gains and losses are amortized over fourteen years (2021 - fourteen years), being the expected average remaining service period of the related employee group, commencing the year after the gain or loss arises.

	2022	2021
Accrued benefit obligation, end of year	\$ 1,954,600	\$ 1,955,900
Unamortized loss	(248,800)	(346,500)
Liability, end of year	\$ 1,705,800	\$ 1,609,400

The most recent actuarial valuation of the District's employee future benefits was completed as at December 31, 2022. The significant actuarial assumptions adopted in measuring the District's accrued benefit obligation are as follows:

	2022	2021
Discount rates	4.5%	2.4%
Expected wage and salary increases	3.5%	2.5 to 3.5%

District of Squamish

13. Accumulated surplus

	2022	2021
Unappropriated surplus	\$ -	\$ 6,897,371
Appropriated surplus		
Non-statutory reserves	12,430,782	11,156,969
Statutory reserves (Schedule 4)	55,401,410	52,716,852
	67,832,192	70,771,192
Investment in tangible capital assets	309,784,512	289,128,896
	\$ 377,616,704	\$ 359,900,088

The unappropriated surplus is the amount of unappropriated accumulated surplus remaining after distributing the other accumulated surplus components.

Appropriated surplus is the amount of accumulated surplus, supported by a portion of the District's cash and receivables, that has been set aside by decision of Council for specified purposes. The statutory reserves have been established by bylaw in accordance with the Community Charter and their use is restricted by the legislation. In the normal course of operations, these funds will be used to finance the future services or capital works for which they have been appropriated and can be employed for working capital, emergency expenditures, and to stabilize taxation and utility fee rates.

Investment in tangible capital assets is equal to the net book value of the tangible capital asset, less related long term debt. In the normal course of operations, the tangible capital assets will be consumed / used to provide services and the debt repaid by future period revenues.

14. Commitments and contingencies

(a) Litigation

The District is currently involved in certain legal actions and other existing conditions involving uncertainty. Financial implications of potential claims against the District, resulting from such litigation, and that are not covered by insurance, are accrued to the extent that amounts are likely to result in a liability and can be reasonably estimated.

As at December 31, 2022, there were legal claims in various stages of litigation for which management is unable to determine the outcome. The outstanding claims are not expected to result in a material loss to the District. As such, no provision has been made in the financial statements for these claims. Losses, if any, resulting from these actions will be recorded in the period the loss becomes likely and can be reasonably estimated.

(b) Municipal Pension Plan

The District and its employees contribute to the Municipal Pension Plan (a jointly trustee pension plan). The board of trustees, representing plan members and employers, is responsible for administering the plan, including investment of assets and administration of benefits. The plan is a multi-employer defined benefit pension plan. Basic pension benefits are based on a formula. As at December 31, 2022, the plan has about 227,000 active members and approximately 118,000 retired members. Active members include approximately 42,000 contributors from local governments.

Every three years, an actuarial valuation is performed to assess the financial position of the plan and adequacy of plan funding. The actuary determines an appropriate combined employer and member contribution rate to fund the plan. The actuary's calculated contribution rate is based on the entry age normal cost method, which produces the long-term rate of member and employer contributions sufficient to provide benefits for average future entrants to the plan. This rate may be adjusted for the amortization of any actuarial funding surplus and will be adjusted for the amortization of any unfunded actuarial liability.

The most recent actuarial valuation for the Municipal Pension Plan as at December 31, 2021, indicated a \$3,761 million funding surplus for basic pension benefits on a going concern basis. The District paid \$1,642,836 for employer contributions to the plan in fiscal 2022 (2021 - \$1,704,480). The next valuation will be as at December 31, 2024, with results available in 2025.

Employers participating in the plan record their pension expense as the amount of employer contributions made during the fiscal year (defined contribution pension plan accounting). This is because the plan records accrued liabilities and accrued assets for the plan in aggregate, resulting in no consistent and reliable basis for allocating the obligation, assets and cost to individual employers participating in the plan.

(c) Demand notes

The District issues its debt instruments through the MFA. These demand notes are contingent in nature and are not reflected in the consolidated financial statements.

District of Squamish

Commitments and Contingencies (continued)

(d) Squamish Oceanfront front ender and municipal share agreements

As permitted under the Local Government Act, the District entered into a Development Cost Charge ("DCC") Front Ender Agreement and Municipal Share Agreements in 2015 for specified infrastructure projects necessary for the development of Oceanfront Lands sold to Matthews Southwest and Bethel Lands Corporation (The Developer) in 2014.

The Agreements provide for the reimbursement of a maximum of \$33,915,438 over a 20 year period for specified DCC projects that the Developer pays for and builds on behalf of the District. Within the agreements there are conditions and restrictions that may limit the reimbursement paid by the District. A key restriction is that reimbursement for most of the specified projects may not exceed 78% of DCC collections received by the District per quarter, during the time when invoices are outstanding. Further, any amounts outstanding at the end of the 20 year term are forgiven.

Only projects identified in the Municipal Share Agreements are eligible for reimbursement of the municipal share portions of the project and only at the time of project completion. The District has discretion to fund and build any project identified in the Agreements and the Developer is not bound to proceed with development activities.

15. Financial Plan

The financial plan amounts presented throughout the consolidated financial statements are presented on a consolidated basis. The District's Financial Plan bylaw 2904, 2022 adopted by Council on April 5, 2022 does not incorporate the operation of its two controlled civic corporations: SPL and SSC. The following reconciles the District's Financial Plan bylaw 2904, 2022 to the financial plan figures as presented on the financial statements

	Financial Plan Bylaw	SPL and SSC Adjustments	Presented Financial Plan
<u>Revenues</u>			
Departmental revenues	\$ 64,950,672	\$ 412,522	\$ 65,363,194
<u>Expenses</u>			
Departmental expenses	63,466,558	347,942	\$ 63,814,500
Annual surplus before Other	<u>\$ 1,484,114</u>	<u>\$ 64,580</u>	<u>\$ 1,548,694</u>
Other	23,748,900	-	\$ 23,748,900
Annual Surplus	<u>\$ 25,233,014</u>	<u>\$ 64,580</u>	<u>\$ 25,297,594</u>

District of Squamish

16. Taxation and utility revenues

Collection for District

The following shows the collections in 2022 for District purposes, including applicable civic corporations:

	Financial Plan 2022	2022	2021
Taxation			
General property levies	\$ 34,165,000	\$ 33,838,930	\$ 31,390,032
Business improvement area	91,570	93,434	93,823
	34,256,570	33,932,364	31,483,855
Other property levies			
Grants-in-lieu of property levies	758,100	1,054,221	782,309
Hotel tax	180,000	670,781	382,872
1% utility revenue	294,830	302,649	304,657
Penalties and interest on property levies	300,000	464,809	296,852
	1,532,930	2,492,460	1,766,690
	35,789,500	36,424,824	33,250,545
Utility user fees			
Solid waste	5,796,300	5,979,382	5,458,764
Water	5,483,000	5,630,044	5,464,349
Waste water	7,094,000	7,390,061	6,945,874
	18,373,300	18,999,487	17,868,987
	\$ 54,162,800	\$ 55,424,311	\$ 51,119,532

Collection for other agencies

The following amounts were collected on behalf of other taxing authorities, and are not included on the District's Consolidated Statement of Operations:

	2022	2021
Province of BC School Taxes	\$ 16,490,358	\$ 14,706,247
BC Assessment Authority	527,892	470,030
Municipal Finance Authority	2,742	2,100
Squamish-Lillooet Regional District	2,539,294	1,989,362
Sea to Sky Regional Hospital District	452,483	345,506
	\$ 20,012,769	\$ 17,513,245

District of Squamish

17. Government transfers

	2022	2021
Operating		
Federal	\$ 961,085	\$ 1,850,248
Provincial	836,808	959,049
Other	56,139	203,031
Total operating	1,854,032	3,012,328
Capital		
Provincial	1,742,732	877,610
Other	115,000	14,500
Total capital	1,857,732	892,110
	\$ 3,711,764	\$ 3,904,438

18. Trusts

The District trust funds account for assets that must be administered as directed by agreement or statute for certain beneficiaries. In accordance with PSAS, trust funds are not included in the District's consolidated financial statements.

The District operates the Mount Garibaldi Cemetery and maintains the Cemetery Care Fund in accordance with the Cemeteries and Funeral Services Act. The following trust funds are administered by the District and are excluded from these consolidated financial statements.

Cemetery Care Fund financial position as at December 31, 2022:

	2022	2021
Financial Assets		
Investments	\$ 287,948	\$ 277,188
Liabilities		
Cemetery care fund	\$ 287,948	\$ 277,188

District of Squamish

19. Segmented information

The District is a diversified municipal government that provides a wide range of services to its citizens, including General Government, Protective Services, Transportation and Transit, Economic and Community Development, Recreation, Parks, Trails and Library, Public Health, Water, Waste Water, and Solid Waste Utilities. For management reporting purposes, the District's operations and activities are organized and reported by Fund. Funds were created for the purpose of recording specific activities to attain certain objectives in accordance with special regulations, restrictions, or limitations.

Municipal services are provided by departments and their activities reported within these funds. Certain functions that have been separately disclosed in the segmented information, along with the services they provide, are as follows:

General Government

General government and fiscal services is comprised of Council and the related support services provided by the Administration and Finance departments, as well as all operations and maintenance costs relating to Municipal Hall and grants to community organizations.

Protective Services

Protective Services is comprised of police, fire, emergency management planning, bylaw enforcement, animal control, and building inspection.

Transportation and Transit

Transportation and Transit is a broad function comprised of engineering departments and the public works crews engaged in the maintenance and improvements to the road systems, drainage, sidewalks, flood protection, fleet maintenance, works yard maintenance, and other planning and maintenance activities. In addition, this function includes transit services and airport operations.

Economic and Community Development

Economic and Community Development is comprised of planning and land use development, environmental planning, economic development and events management with the common goal of developing Squamish into a healthy, vibrant, and economically viable community. In addition, the District's civic corporation, Squamish Sustainability Corporation have been consolidated into this function for reporting purposes.

Recreation, Parks, Trails and Library

Recreation, Parks, Trails, and Library is comprised of the arena and community centre, seniors centre, youth centre, and an extensive networks of parks and trail systems throughout the community. In addition, the District's civic corporation, the Squamish Public Library, has been consolidated into this function for reporting purposes.

Health, Social and Housing

Health, Social, and Housing is comprised of municipal cemetery services and other health, social, and housing initiatives.

Water and Waste Water Utilities

The water and waste water utilities is comprised of the water and waste water system networks, storm mains, and pump stations.

Solid Waste Utility

The solid waste utility is comprised of garbage, recycling, organic waste collection services as well as the operation of the landfill.

District of Squamish
Schedule 1 - Tangible capital assets

For the year end December 31 2022												
	Land	Land Improvements	Buildings	Furniture, Vehicles and Equipment	Transportation Infrastructure	Solid Waste Infrastructure	Water Infrastructure	Waste Water Infrastructure	Assets under Construction	Total		
COST												
Opening Balance	\$ 71,887,387	\$ 46,391,310	\$ 42,440,258	\$ 24,313,600	\$ 113,737,140	\$ 13,496,517	\$ 69,325,402	\$ 68,106,582	\$ 21,150,194	\$ 470,848,390		
Add: Additions	-	90,708	16,030,217	1,469,439	3,513,312	27,106	2,415,170	1,114,910	15,902,385	40,563,247		
Less: Disposals	-	-	-	(779,064)	-	-	-	-	-	(779,064)		
Add: Transfers	-	-	-	-	-	-	-	-	(10,795,185)	(10,795,185)		
Less: Writedowns	-	-	-	-	-	-	-	-	(216,980)	(216,980)		
Closing Balance	71,887,387	46,482,018	58,470,475	25,003,975	117,250,452	13,523,623	71,740,572	69,221,492	26,040,414	499,620,408		
ACCUMULATED AMORTIZATION												
Opening Balance	-	11,247,999	21,371,215	12,234,397	44,461,270	4,363,007	22,314,811	25,386,379	-	141,379,078		
Add: Amortization	-	1,121,193	1,096,403	2,037,728	3,254,546	1,193,408	1,254,230	1,351,050	-	11,308,558		
Less: Accumulated Amortization on Disposals	-	-	-	(722,087)	-	-	-	-	-	(722,087)		
Closing Balance	-	12,369,192	22,467,618	13,550,038	47,715,816	5,556,415	23,569,041	26,737,429	-	151,965,549		
Net Book Value	\$ 71,887,387	\$ 34,112,826	\$ 36,002,857	\$ 11,453,937	\$ 69,534,636	\$ 7,967,208	\$ 48,171,531	\$ 42,484,063	\$ 26,040,414	\$ 347,654,859		

District of Squamish
Schedule 2 - Tangible capital assets

For the year end December 31 2021										
	Land	Land Improvements	Buildings	Furniture, Vehicles and Equipment	Transportation Infrastructure	Solid Waste Infrastructure	Water Infrastructure	Waste Water Infrastructure	Assets under Construction	Total
COST										
Opening Balance	\$ 71,514,575	\$ 45,807,148	\$ 42,038,150	\$ 21,424,383	\$ 108,424,550	\$ 12,821,031	\$ 67,912,089	\$ 67,377,036	\$ 8,945,570	\$ 446,264,532
Add: Additions	372,812	584,162	955,297	3,324,487	5,333,186	675,486	1,413,313	729,546	15,024,673	28,412,962
Less: Disposals	-	-	(553,189)	(435,270)	(20,596)	-	-	-	-	(1,009,055)
Add: Transfers	-	-	-	-	-	-	-	-	(2,820,049)	(2,820,049)
Closing Balance	71,887,387	46,391,310	42,440,258	24,313,600	113,737,140	13,496,517	69,325,402	68,106,582	21,150,194	470,848,590
ACCUMULATED AMORTIZATION										
Opening Balance	-	10,127,641	20,645,026	10,823,472	41,706,744	3,194,335	21,094,880	24,061,126	-	131,653,224
Add: Amortization	-	1,120,358	983,399	1,834,860	2,775,122	1,168,672	1,219,931	1,325,253	-	10,427,595
Less: Accumulated Amortization on Disposals	-	-	(257,210)	(423,935)	(20,596)	-	-	-	-	(701,741)
Closing Balance	-	11,247,999	21,371,215	12,234,397	44,461,270	4,363,007	22,314,811	25,386,379	-	141,379,078
Net Book Value	\$ 71,887,387	\$ 35,143,311	\$ 21,069,043	\$ 12,079,203	\$ 69,275,870	\$ 9,133,510	\$ 47,010,591	\$ 42,720,203	\$ 21,150,194	\$ 329,469,312

District of Squamish
Schedule 3 - Statement of Operations by Segment

	For the year end December 31									
	10	20	30	40	50	60	70	80	90	2021
	General Government	Protective Services	Transportation & Transit	Economic & Community Development	Parks Recreation Culture	Health Social & Housing	Solid Waste Management	Water Services	Waste Water Services	2022
Revenue										
Taxation (Note #16)	\$ 33,932,364	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 33,932,364
Other property levies (Note #16)	1,821,679	-	-	670,781	-	-	-	-	-	2,492,460
Utility user fees (Note #16)	-	-	-	-	-	-	5,979,382	5,630,044	7,390,061	18,999,487
Other revenue from own sources	33,459	67,898	637,243	273,542	816,656	45,494	-	-	-	1,874,292
Other fees and charges	542,101	3,160,427	278,148	1,092,783	318,084	15,250	291,804	87,255	11,254	5,797,106
Government transfers for operating (Note #17)	920,448	528,411	116,086	276,166	4,117	8,804	-	-	-	1,854,032
Investment income	2,999,725	-	-	-	6,276	-	41,108	102,199	159,054	3,307,362
	40,249,776	3,756,736	1,031,477	2,313,272	1,145,133	69,548	6,312,294	5,819,498	7,559,369	68,257,103
Expenses										
Payroll and benefits	7,521,240	5,021,717	3,726,996	2,134,105	4,135,409	36,691	207,035	798,960	780,180	24,362,333
Operating Expenses	2,858,724	5,968,205	2,558,231	1,697,579	2,507,648	256,164	5,080,844	1,755,259	3,123,912	25,806,566
Debt service - interest	525,062	184,172	31,320	125,382	5,137	-	97,075	170,854	163,149	1,302,151
Amortization expense	7,410,261	-	-	5,819	93,790	-	1,193,408	1,254,230	1,351,050	11,308,558
	18,315,287	11,174,094	6,316,547	3,962,885	6,741,984	292,855	6,578,362	3,979,303	5,418,291	62,779,808
Annual surplus (deficit) before Other	21,934,489	(7,417,358)	(5,285,070)	(1,649,613)	(5,596,851)	(223,307)	(266,068)	1,840,195	2,141,078	5,477,495
Other										
Government transfers for capital (Note #17)	-	-	1,728,370	79,362	50,000	-	-	-	-	1,857,732
Developer cost charge capital revenues	-	-	3,371,224	-	-	-	-	276,806	3,715,944	7,363,974
Developer contributed assets	448,696	3,046	-	2,111,984	-	-	-	119,375	306,111	2,989,212
Loss on disposal of tangible capital assets	(34,616)	-	-	-	(6,089)	-	-	-	-	(40,705)
Capital Connections	-	-	-	-	-	-	-	43,729	6,203	49,932
Other Capital revenues	-	-	14,476	-	-	-	-	-	4,500	18,976
	414,080	3,046	5,114,070	2,191,346	43,911	-	-	439,910	4,032,758	12,239,121
Annual Surplus (Deficit)	\$ 22,348,569	\$ (7,414,312)	\$ (171,000)	\$ 541,733	\$ (5,552,940)	\$ (223,307)	\$ (266,068)	\$ 2,280,105	\$ 6,173,836	\$ 17,716,616
										\$ 12,231,583

District of Squamish
Schedule 4 - Continuity of reserves

For the year end December 31	Balance, beginning of year	Contributions	Investment income	Expenditures	Transfers	Internal Borrowing	2022
Sinking Fund Surplus - General - Bylaw 900	\$ 297,855	\$ -	10,230	\$ -	-	-	\$ 308,085
Sinking Fund Surplus - Water - Bylaw 900	632,825	-	21,740	-	-	-	654,565
Sinking Fund Surplus - Waste Water - Bylaw 900	743,297	-	25,540	-	-	-	768,837
Land Reserve - Bylaw 720	9,835,170	-	208,690	(7,625,848)	(106,500)	-	2,311,512
Equipment Replacement - Bylaw 538	6,817,432	1,066,200	247,330	(304,340)	-	-	7,826,622
Community Works Fund - Bylaw 1950	4,307,737	1,832,641	146,880	(1,374,867)	(524,496)	-	4,387,895
Capital Rehab - General - Bylaw 2346	6,924,200	2,640,700	244,900	(2,347,713)	696	-	7,462,783
Capital Rehab - Water - Bylaw 2347	7,708,859	2,710,000	283,310	(2,260,131)	100,000	-	8,542,038
Capital Rehab - Waste Water - Bylaw 2348	9,900,354	3,228,980	381,580	(1,737,330)	23,940	-	11,797,524
Capital Rehab - Solid Waste - Bylaw 2349	1,869,719	300,000	95,050	(30,373)	2,342	-	2,236,738
Municipal Off-Street Parking Facilities Reserve Fund - Bylaw 2553	638,432	-	21,060	(51,193)	-	-	608,299
Alternative Forms of Transportation Reserve Fund - Bylaw 2553	971,400	-	33,380	-	-	-	1,004,780
Affordable Housing - Bylaw 1951	1,291,757	(140,000)	41,980	-	-	-	1,193,737
Carbon Neutral - Bylaw 2079	192,697	153,082	8,910	(20,000)	-	-	334,689
Vanoc Legacy - Bylaw 2101	7,700	-	260	-	-	-	7,960
Parkland in Lieu - Bylaw 720	42,198	-	1,450	-	-	-	43,648
Corridor Trail MOU - Bylaw 750	214,339	-	7,360	-	-	-	221,699
Environmental Reserve Fund - Bylaw 2640	135,694	90,000	6,210	-	-	-	231,904
General Operating Reserve - Bylaw 2788	185,187	-	166,550	-	9,327,659	(4,221,301)	5,458,095
Total	\$ 52,716,852	\$ 11,881,603	\$ 1,952,410	\$ (15,751,795)	\$ 8,823,641	\$ (4,221,301)	\$ 55,401,410

District of Squamish
Consolidated Financial Statements
For the year ended December 31, 2023



District of Squamish

December 31, 2023

Management's Responsibility for Financial Reporting

The Council of the District of Squamish ("District") has delegated the responsibility for the integrity and objectivity of the financial information contained in the consolidated financial statements to the management of the District. The consolidated financial statements which, in part, are based on informed judgements and estimates, have been prepared by management in accordance with Canadian public sector accounting standards, which have been applied on a basis consistent with that of the preceding year.

To assist in carrying out their responsibility, management maintains an accounting system and internal controls to provide reasonable assurance that transactions are executed and recorded in accordance with authorization and that financial records are reliable for preparation of financial statements.

The Mayor and Council oversee management's responsibilities for the financial reporting and internal control systems. Council annually reviews and approves the consolidated financial statements.

The District's independent auditors, BDO Canada LLP, are engaged to express an opinion as to whether these consolidated financial statements present fairly the District's consolidated financial position, operations, and cash flows in accordance with Canadian public sector accounting standards. Their opinion is based on procedures they consider sufficient to support such an opinion in accordance with Canadian generally accepted auditing standards.

The consolidated financial statements have, in management's opinion, been properly prepared within reasonable limits of materiality and in accordance with Canadian public sector accounting standards.

Heather Boxrud, MBA, CPA, CGA
Chief Financial Officer
May 13, 2024



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BDO Canada LLP
1200 Alpha Lake Road
Suite 202
Whistler BC V8E 0H6

Independent Auditor's Report

To the Mayor and Councillors of the District of Squamish

Opinion

We have audited the accompanying consolidated financial statements of the District of Squamish and its controlled entities (the "District"), which comprise the Consolidated Statement of Financial Position as at December 31, 2023, the Consolidated Statements of Operations and Accumulated Surplus, Change in Net Financial Assets, Remeasurement Gains and Losses, and Cash Flows for the year then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the District as at December 31, 2023, and its results of consolidated operations, change in net financial assets, and consolidated cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally-accepted auditing standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Consolidated Financial Statements* section of this report. We are independent of the District in accordance with the ethical requirements that are relevant to our audit of the consolidated financial statements in Canada and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the District's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the District or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the District's financial reporting process.

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.



Auditor's Responsibilities for the Audit of the Consolidated Financial Statements (Continued)

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the District's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the District to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the District to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.


BDO Canada LLP

Chartered Professional Accountants


Whistler, British Columbia
May 13, 2024

District of Squamish
Consolidated Statement of Financial Position

December 31	2023	2022 (Restated)
Financial Assets		
Cash and cash equivalents (Note #4)	\$ 115,404,477	\$ 109,090,004
Investments (Note #5)	5,841,294	5,506,016
Accounts receivable (Note #6)	7,771,394	7,873,619
Debenture deposits (Note #7)	713,673	716,523
Security deposits	10,000	10,000
	129,740,838	123,196,162
Liabilities		
Accounts payable, accrued and other liabilities (Note #8)	32,468,757	22,086,930
Deferred revenue (Note #9)	9,542,487	7,701,137
Asset retirement obligations (Note #10)	6,470,457	6,336,418
Development cost charges (Note #11)	16,124,997	19,267,070
Debt (Note #12)	33,273,814	37,870,347
Provision for post-employment benefits (Note #13)	1,845,000	1,705,800
	99,725,512	94,967,702
Net Financial Assets	30,015,326	28,228,460
Non-Financial Assets		
Tangible capital assets (Schedule 1)	370,272,680	347,804,342
Inventories	636,855	654,461
Prepaid expenses	203,425	192,461
	371,112,960	348,651,264
Accumulated Surplus (Note #14)	\$ 401,128,286	\$ 376,879,724
Commitments and contingencies (Note #15)		



Heather Boxrud, MBA, CPA, CGA
Chief Financial Officer



Armand Hurford
Mayor of Squamish

District of Squamish
Consolidated Statement of Operations and Accumulated Surplus

For the year end December 31	Financial Plan		
	2023 (Note #16)	2023	2022 (Restated)
Revenue (Schedule 2)			
Taxation (Note #17)	\$ 37,315,000	\$ 37,046,411	\$ 33,932,364
Other property levies (Note #17)	1,557,100	2,849,387	2,492,460
Utility user fees (Note #17)	18,609,300	19,501,381	18,999,487
Other revenue from own sources	2,498,421	3,485,426	1,874,292
Other fees and charges	5,204,800	5,972,970	5,797,106
Government transfers for operating (Note #18)	2,791,753	8,562,959	1,854,032
Investment income	1,695,637	6,106,720	3,307,362
	<u>69,672,011</u>	<u>83,525,254</u>	<u>68,257,103</u>
Expenses (Schedule 2)			
General Government	19,090,744	20,717,939	18,338,957
Protective Services	13,833,465	12,640,078	11,174,094
Transportation & Transit	6,962,777	7,130,853	6,316,547
Economic & Community Development	4,703,278	5,269,299	3,962,885
Parks, Recreation & Culture	7,271,349	7,507,248	6,741,984
Health, Social & Housing	589,830	507,496	292,855
Solid Waste Management	6,714,344	6,149,712	6,008,647
Water Services	4,738,285	4,326,168	3,979,303
Waste Water Services	5,618,397	6,135,176	5,418,291
	<u>69,522,469</u>	<u>70,383,969</u>	<u>62,233,563</u>
Annual surplus before Other	<u>149,542</u>	<u>13,141,285</u>	<u>6,023,540</u>
Other			
Government transfers for capital (Note #18)	18,763,200	2,079,647	1,857,732
Developer cost charge capital revenues	17,070,800	5,493,211	7,363,974
Developer contributed assets	630,000	3,758,626	2,989,212
Loss on disposal of tangible capital assets	-	(119,713)	(40,705)
Other capital revenues	-	82,325	68,908
	<u>36,464,000</u>	<u>11,294,096</u>	<u>12,239,121</u>
Annual Surplus	<u>36,613,542</u>	<u>24,435,381</u>	<u>18,262,661</u>
Accumulated Surplus, beginning of year	376,879,724	376,879,724	359,900,088
Adjustment on adoption of the Asset Retirement Obligation Standard (Note #10)	-	-	(1,283,025)
Accumulated Surplus, end of year	<u>\$ 413,493,266</u>	<u>\$ 401,315,105</u>	<u>\$ 376,879,724</u>

District of Squamish
Consolidated Statement of Change in Net Financial Assets

For the year end December 31	Financial Plan		
	2023 (Note #16)	2023	2022 (Restated)
Annual surplus	\$ 36,613,542	\$ 24,435,381	\$ 18,262,661
Acquisition of tangible capital assets	(92,601,569)	(32,518,603)	(28,928,707)
Contributed tangible capital assets	(630,000)	(2,397,553)	(622,376)
Amortization expense	10,200,000	12,314,472	11,315,317
Loss on disposal of tangible capital assets	-	119,713	40,705
Proceeds on sale of tangible capital assets	-	13,635	16,272
	(83,031,569)	(22,468,336)	(18,178,789)
Other non-financial assets			
Decrease (increase) in inventories	-	17,603	(164,845)
Decrease (increase) in prepaid expenses	-	(10,963)	326,510
	-	6,640	161,665
Net remeasurement losses	-	(186,819)	-
Change in net financial assets (liabilities)	(46,418,027)	1,786,866	245,537
Net financial assets, beginning of year	28,228,460	28,228,460	27,982,923
Net financial assets (debt), end of year	\$ (18,189,567)	\$ 30,015,326	\$ 28,228,460

District of Squamish
Consolidated Statement of Remeasurement Gains and Losses

For the year end December 31	2023	2022
Unrealized loss attributed to:		
Pooled investments	\$ (186,819)	\$ -
Amounts reclassified to statements of Operations:		
Pooled investments	-	-
Net remeasurement losses	(186,819)	-
Accumulated remeasurement gain (losses) beginning of year	-	-
Accumulated remeasurement losses end of year	\$ (186,819)	\$ -

District of Squamish
Consolidated Statement of Cash Flows

For the year end December 31	2023	2022 (Restated)
Cash provided by (used in)		
Operating transactions		
Annual surplus	\$ 24,435,381	\$ 18,262,661
Non-cash items included in annual surplus		
Amortization	12,314,472	11,315,317
Accretion expense	163,354	159,970
Contributed tangible capital assets	(2,397,553)	(622,376)
Loss on disposal of tangible capital assets	119,713	40,705
Provision for post employment benefits	139,200	96,400
Development cost charges revenue recognized	(5,493,211)	(7,363,974)
Actuarial adjustment on debt	(758,100)	(923,634)
Changes in other non-cash working capital	12,305,577	(2,485,985)
	40,828,833	18,479,084
Investing transactions		
Proceeds from disposal (purchase of) investments	(522,096)	2,997,545
Capital transactions		
Purchase of tangible capital assets	(32,518,603)	(28,928,707)
Proceeds from sale of tangible capital assets	13,635	16,272
	(32,504,968)	(28,912,435)
Financing transactions		
Development cost charges received, including interest	2,351,138	3,713,530
Repayment of the short-term portion of Debt	-	(7,500,000)
Proceeds of the long-term portion of Debt	-	9,695,598
Debt principal repaid	(3,816,883)	(3,721,794)
Capital leases	(21,551)	(20,240)
	(1,487,296)	2,167,094
Increase (decrease) in cash	6,314,473	(5,268,712)
Cash and cash equivalents, beginning of year	109,090,004	114,358,716
Cash and cash equivalents, end of year (Note #4)	\$ 115,404,477	\$ 109,090,004
Supplemental information:		
Interest paid	\$ 1,488,972	\$ 1,302,152

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2023

The Notes to the Consolidated Financial Statements ("Notes") are an integral part of the financial statements. The following explains the significant accounting policies and reporting principles underlying these statements. The Notes also provide relevant supplementary information and explanations.

1. Status of The District of Squamish

The District of Squamish ("District") is a municipality that was incorporated on December 15, 1964 pursuant to the Municipal Act and subsequently continued under the Local Government Act, a statute of the Legislature of the Province of British Columbia ("Province"). The District is subject to the provisions of the Community Charter and legislation under the Province. The District's principal activity is providing property tax funded services such as general government, protective (police and fire), transportation, economic and community development, and parks and recreation. The District provides public utilities for solid waste, water, and waste water services. The District also operates a cemetery and an aquatic centre (facility owned by the Squamish-Lillooet Regional District) and provides the community with library and other services.

2. Significant Accounting Policies

The consolidated financial statement have been prepared by management in accordance with Canadian public sector accounting standards ("PSAS"). The significant accounting policies are summarized below.

Basis of consolidation

The consolidated financial statements include the assets, liabilities, reserves, surpluses / deficits, revenues, and expenses of those District funds and government functions or entities which have been determined to comprise a part of the aggregate District operations based upon control exercised by the District. Inter-fund and inter-corporate balances and transactions have been eliminated.

I) Consolidated entities

The organizations (referred to as civic corporations) included in the consolidated financial statements are as follows:

Squamish Public Library ("SPL"), which was incorporated without share capital as a municipal library of the District on May 15, 2003.

Squamish Sustainability Corporation ("SSC"), which was incorporated with the District as the sole shareholder on October 13, 2005.

II) Squamish Community Forest Corporation and Squamish Community Forest Limited Partnership

The District of Squamish holds 50% of the shares in Squamish Community Forest Corporation and is a 25% limited partner in Squamish Community Forest Limited Partnership.

Notes to the Consolidated Financial Statements

December 31, 2023

Significant Accounting Policies (continued)

(III) Squamish District Community Pool

The Squamish-Lillooet Regional District ("SLRD") has contracted with the District to provide aquatic centre ("Squamish District Community Pool") recreational services. The District provides the programs and services at the Squamish District Community Pool on behalf of the SLRD. This facility was established and constructed under authority of the SLRD Service Area Establishment Bylaw No. 438. The related assets, liabilities, revenues, and expenses are reported in the SLRD financial statements, as the taxing authority and owner of the facility. Therefore, the District does not include any portion of the Squamish District Community Pool financial position or operations in the consolidated financial statements.

Basis of accounting

The consolidated financial statements are prepared using the accrual basis of accounting. The accrual basis of accounting records revenues as it is earned and measurable. Expenses are recognized as they are incurred based upon receipt of goods or services and / or creation of a legal obligation to pay.

I) Fund accounting

As a local government, the District uses fund accounting. The resources and operations of the District have been segregated for accounting and financial reporting purposes into the following funds, which are presented as supplementary information: General, Solid Waste, Water, and Waste Water.

II) Segment disclosure

The District segregates its operations for financial reporting based upon group of activities / services. A segment is defined as a distinguishable activity or group of activities / services of a government for which it is appropriate to separately report financial information. The District provides this additional segment information in Schedule 2.

Financial Instruments

Financial Instruments are classified into two categories: (I) fair value and (II) cost / amortized cost.

All financial assets are tested annually for impairment. When financial assets are impaired, impairment losses are recorded in the Consolidated Statement of Operations and Accumulated Surplus.

Transaction costs are added to the carrying value for financial instruments measured using cost or amortized cost. Transaction costs are expensed for financial instruments measured at fair value.

(I) Fair Value

The District has elected to measure the MFA Mortgage Fund at fair value, based upon quoted prices in an active market for identical investments, to correspond with how they are evaluated and managed. Unrealized gains and losses are recognized in the Consolidated Statement of Remeasurement Gains and Losses until such time that the financial asset is derecognized due to sale or impairment. At the time of derecognition, the related gains

Notes to the Consolidated Financial Statements

December 31, 2023

Significant Accounting Policies (continued)

and losses are reversed from the Consolidated Statement of Remeasurement Gains and Losses and reported in the Consolidated Statement of Operations and Accumulated Surplus.

(II) Cost / amortized cost

The cost / amortized cost category includes cash and cash equivalents, accounts receivable, accounts payable and accrued liabilities, and debt. The assets are measured using the effective interest rate method. Gains and losses are recognized in the Consolidated Statement of Operations and Accumulated Surplus upon derecognition or impairment. The carrying amount of each of these financial instruments is presented in the Consolidated Statement of Financial Position.

Deferred revenue

Government transfers, contributions, and other amounts are received from third parties pursuant to legislation, regulation, or agreement. They may only be used in the conduct of certain programs, in the completion of specific work, or for the acquisition and construction of tangible capital assets.

Development cost charges ("DCC") are collected for which the related services or capital costs have yet to be performed. Revenue is recognized in the period when the related expenses (such as development costs) are incurred, services performed, or the tangible capital assets are acquired.

Contaminated sites

Governments are required to accrue a liability for the costs to remediate a contaminated site. The District recognizes a liability, at the estimated net present value of remediation cost, when an environmental standard exists, contamination exceeds the standard, the government has responsibility for remediation, future economic benefits will be given up, and a reasonable estimate can be made.

Employee future benefits

The District and its employees make contributions to the Municipal Pension Plan ("MPP"). These District contributions are expensed as incurred.

For post-employment benefits, the District accrues for the employees' Sick Leave Plan, Full Annual Vacation at Retirement Plan, and the Retirement Pay Plan. The liabilities related to these benefits are actuarially determined based on period of service and best estimates of retirement ages and expected salaries. The liabilities under these benefit plans are accrued based on projected benefits as the employees render services necessary to earn the future benefits. Actuarial gains and losses are amortized over the expected average remaining service period of the related employee group, commencing their year after the gain or loss arises.

Non-financial asset

Non-financial assets are held for use in the provision of goods and services but are not available to discharge existing liabilities. These assets may have a useful life extending beyond the current year and are not intended

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2023

Significant Accounting Policies (continued)

for sale in the ordinary course of operations.

Intangible assets, such as water rights and mineral resources, unless acquired by the District through an arm's length exchange, are not recorded in the financial statements.

Tangible capital assets are recorded at cost which includes costs that are directly attributable to the acquisition, construction, development, or betterment of the assets. The cost, less residual value, of the tangible capital asset (excluding land) is amortized on a straight-line basis over their estimated useful life as follows:

Fund	Asset Category	Useful Life Range (years)
General	Land	n/a
	Land improvements	5 to 200
	Buildings	5 to 60
	Furniture, vehicles, and equipment	3 to 40
	Transportation infrastructure	5 to 100
Solid Waste	Solid waste infrastructure	12 to 50
Water	Water infrastructure	5 to 100
Waste Water	Waste water infrastructure	5 to 100

Tangible capital assets, including assets under construction, are recorded at cost. Amortization is charged over the asset's useful life in a rational and systematic manner, considering cost less any residual value. Assets under construction are not amortized. When assets are substantially complete and available for use, they cease to be classified as assets under construction and their period of amortization begins.

Contributed tangible capital assets are recognized at fair value (using various methods including actual developer costs, appraisals, assessed value, or professional estimations) at the date of contribution and are also recognized as revenue. Where an estimate of fair market value cannot be made, the tangible capital asset is recognized at nominal value.

Leases are classified as capital or operating leases. Leases which transfer substantially all of the benefits and risks incidental to ownership of property are classified as capital and the related assets are accounted for as tangible capital assets. All other leases are classified as operating leases and the related lease payments are charged to expenses as incurred.

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2023

Significant Accounting Policies (continued)

The District's tangible capital assets do not include works of art and historical treasures because a reasonable estimate of the future benefits associated with such property cannot be made.

Inventories

Inventories are recorded at the lower of cost and replacement cost. Donated materials are initially recorded at their fair value, if determinable, and subsequently at the lower of cost and replacement cost.

Tax revenues

Taxes are levied to provide revenue to the District for the provision of public services. Tax revenues are recognized as revenue in the year they are levied as the tax revenues result from non-exchange transactions that are compulsorily paid to local governments in accordance with the established laws and regulations.

The tax revenues include levies on behalf of consolidated entities, business improvement area(s), and utility frontage taxes.

The property tax revenue relies on market assessment of land value that are subject to appeal. Through the British Columbia Assessments appeal process, taxes may be adjusted by way of supplementary roll adjustments. Estimates are made of potential adjustments to taxes. Any additional adjustments required over those estimated are recognized at the time they are awarded.

The District is required by the Province and other taxing authorities to collect and remit levies in respect of properties. The District has no jurisdiction or control over these levies. Therefore, levies imposed by other taxing authorities are not reflected as a District revenue and expense. The funds collected are presented as a payable to the taxing authority.

Government transfers

Government transfers are transfers of monetary assets or tangible capital assets to the District that are not the result of an exchange transaction, a direct financial return, or expected to be repaid in the future. Government transfers, which include legislative grants, are recognized as revenue in the consolidated financial statements when the transfer is authorized and any eligibility criteria have been met, stipulations, if any, have been met, and reasonable estimates of the amounts can be determined.

Other revenues

The District recognizes other revenues for the provision of utility and other public services.

The utility services include water, waste water, and solid waste. The revenue for water, waste water, and solid waste usage are recorded as a user fee. Other utility revenues are recorded for servicing properties such as connection fees, which are recognized when the connection has been established.

Notes to the Consolidated Financial Statements

December 31, 2023

Significant Accounting Policies (continued)

Other sales of goods and services include revenue from other government services such as general government, transportation, economic and community development, parks and recreation, and the consolidated civic corporations.

Estimates

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosures of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reported period. Actual results will depend on future economic events and could differ from those estimates. The significant areas requiring management estimates include accrued and other liabilities, asset retirement obligations, provision for post-employment benefits, the value of developer contributed assets, and the useful lives of tangible capital assets

Contingent liabilities

Liabilities for potential obligations that are contingent on future events are recognized when it is likely that the future event will confirm the existence of the obligation and the amount of the liability can be reasonably estimated. Disclosure for potential obligations that do not meet the threshold is made when the occurrence of the confirming future event is likely, but the amount of the liability cannot be reasonably estimated, or the occurrence of the confirming future event is not determinable.

Financial plan

The 2023 financial plan is included on the Consolidated Statements of Operations and Accumulated Surplus and the Consolidated Change in Net Financial Assets. The financial plan is compiled from the District Council approved financial plan bylaw and adjusted for consolidated entities.

New Accounting Standard

On January 1, 2023 the District adopted Public Accounting Standard PS 3280 - Asset Retirement Obligations ("ARO"). The new accounting standard addresses the reporting of legal obligations associated with the retirement of tangible capital assets.

An ARO is recognized when, as at the financial reporting date, all of the following criteria are met: 1) there is a legal obligation to incur retirement costs in relation to tangible capital assets, 2) the past transaction or event giving rise to the liability has occurred, 3) it is expected that future economic benefits will be given up, and 4) a reasonable estimate of the amount can be made.

Upon initial recognition of the liability for the ARO, the District recognized asset retirement cost by increasing the carrying amount of the related tangible capital asset. Amounts capitalized as a result of an ARO are amortized with the related tangible capital asset in accordance with the tangible capital asset policy. Asset retirement costs associated with fully amortized tangible capital assets and recognized tangible capital assets are recorded to accumulated surplus.

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2023

Significant Accounting Policies (continued)

The obligation is measured based on the estimate of future cash flows required to settle the liability and discounted using the cost of borrowing. This liability is subsequently reviewed at each financial reporting date and adjusted for the passage of time and for any revisions to the timing, amount required to settle the obligation or the discount rate.

This standard was applied on a modified retroactive basis, which required the District to apply the standards to events and transactions from the date of origin using January 1, 2023 assumptions and discount rate. The impact has been summarized below.

	December 31, 2022		December 31, 2022	
	Previously stated	Adjustment	Restated	
Liabilities				
Asset retirement obligation	\$ -	\$ 6,336,418	\$	6,336,418
Provision for solid waste landfill	5,449,955	(5,449,955)		-
	<u>\$ 5,449,955</u>	<u>\$ 886,463</u>	<u>\$</u>	<u>6,336,418</u>
Net Financial Assets	<u>\$ 29,114,923</u>	<u>\$ (886,463)</u>	<u>\$</u>	<u>28,228,460</u>

	December 31, 2022		December 31, 2022	
	Previously stated	Adjustment	Restated	
Non-Financial Assets				
Tangible capital assets	<u>\$ 347,654,859</u>	<u>\$ 149,483</u>	<u>\$</u>	<u>347,804,342</u>
Accumulated Surplus				
Accumulated surplus end of year	<u>\$ 377,616,704</u>	<u>\$ (736,980)</u>	<u>\$</u>	<u>376,879,724</u>

3. Financial Instruments Risks

The District is exposed to credit risk and liquidity risk from financial instruments.

(I) Credit risk

Credit risk primarily arises from the District's cash and cash equivalents, accounts receivable, and portfolio investments. The risk exposure is limited to their varying amounts at the date of the financial statement of position.

The District manages cash and cash equivalents credit risk by holding balances of cash and cash equivalents and GICs held by Civic Corporations with reputable top rated financial institutions. The District manages exposure to credit risk related to the MFA Mortgage Fund investments by maintaining its investments in the Municipal

Notes to the Consolidated Financial Statements

December 31, 2023

Financial Instruments Risks (continued)

Finance Authority, which meets the investment requirements of Section 183 of the Community Charter of the Province.

The District has three primary sources of accounts receivable: property taxation, utility fees, and government grants. Credit risk for all primary sources is mitigated through legislated payments for property taxation and utility fees and formal commitments from government agencies.

Portfolio investment credit risk is mitigated through restrictive legislation investment options.

(II) Liquidity risk

Liquidity risk is the risk that the District will not be able to meet its financial obligations as they become due. The District meets its liquidity requirements by holding assets that can be readily converted into cash and preparing annual operating and capital expenditure budgets, which are monitored and updated as required. In addition, the District requires that funding for significant capital projects be secured before expenditures are incurred.

The two primary sources of liquidity risk to the District are accounts payable and accrued liabilities and debt. The District has sufficient net assets to meet its accounts payable and accrued liabilities obligations. The District manages debt liabilities through fixed repayment terms; the schedule of debt is detailed in financial statement Note 12.

4. Cash and Cash Equivalents

	2023	2022
Cash	\$ 112,547,967	\$ 106,209,049
Cash equivalents	2,783,874	2,714,053
Cash held by civic corporations	72,636	166,902
	\$ 115,404,477	\$ 109,090,004

The District's Operating Account, presented as "Cash" is comprised of deposits at Scotiabank and accrues interest at a rate of the Scotiabank Reference Rate + 0.3% (2022 - Scotiabank Reference Rate + 0.3%).

Cash Equivalents are comprised of Scotiabank "Notice Plan" deposits which accrue interest at a rate of the Scotiabank Reference Rate + 0.35% (2022 - Scotiabank Reference Rate + 0.35%) and requires 20 days notice to liquidate.

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2023

5. Investments

	2023		2022
MFA Mortgage Fund	\$ 5,167,255	\$	5,168,669
Investments held by civic corporations	647,039		337,347
	\$ 5,814,294	\$	5,506,016

The District has elected to record its investments at fair value.

Investments in civic corporations consist of Guaranteed Investment Certificates.

6. Accounts Receivable

	2023		2022
Property taxes	\$ 2,152,465	\$	2,412,462
Utilities	842,582		1,276,878
Government transfers	2,136,673		1,907,866
GST	982,261		1,005,226
Trade accounts and other	1,660,742		1,275,654
Allowance for doubtful accounts	(3,329)		(4,467)
	\$ 7,771,394	\$	7,873,619

The District receives government transfers from senior levels of government, including the Province and the Federal Government of Canada.

The District, as a local government, receives goods and services tax rebates and input tax credits from the Canada Revenue Agency, Government of Canada.

7. Debenture Deposits

	2023		2022
General	\$ 469,054	\$	473,802
Solid waste	73,460		73,610
Water	80,583		82,048
Waste water	90,576		87,063
	\$ 713,673	\$	716,523

The District issues its debt instruments through Municipal Finance Authority ("MFA"). A portion of the debt proceeds are withheld in the debt reserve fund by the MFA; these are considered District cash deposits and are a

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2023

Debenture Deposits (continued)

condition of the borrowings. These deposits are invested by MFA and earn a return net of expenses. They are refundable upon maturity of the underlying debt.

8. Accounts Payable, Accrued and Other Liabilities

	2023		2022
Accrued liabilities and trade liabilities	\$ 19,451,521	\$	13,642,387
Wages and benefits payable	3,276,747		1,046,034
Accrued interest payable	318,153		334,433
Deposits	9,422,336		7,064,076
	\$ 32,468,757	\$	22,086,930

9. Deferred Revenue

	2023		2022
Prepaid taxes	\$ 855,128	\$	1,055,710
Prepaid utilities fees	280,035		386,855
Development cash-in-lieu	2,935,459		2,910,202
Deferred government transfers	3,727,404		2,804,723
Other deferred revenue	1,744,461		543,647
	\$ 9,542,487	\$	7,701,137

The District records deferred revenue for funds received in advance of services rendered and is recognized as revenue in the period the services are provided. These funds are restricted in nature and therefore, presented as a liability.

10. Asset Retirement Obligations

	2023		2022
Opening balance			
Landfill ARO	\$ 5,666,543	\$	5,523,485
Other ARO	669,875		652,963
Accretion expense	163,354		159,970
Other adjustment	(29,315)		-
	\$ 6,470,457	\$	6,336,418

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2023

Asset Retirement Obligations (continued)

Asset retirement obligations have been recorded for the following: landfill post closure costs, asbestos remediation, well decommissioning, and lease agreement conditions.

The landfill is expected to close in 2030. Monitoring of the landfill will be required for an additional 30 years after closure.

The liability has been estimated using a net present value technique with a discount rate of 2.59% (2022 - 2.59%) and an inflation rate of 3.4% (2022 - 3.4%).

11. Development Cost Charges

	2023		2022	
Development cost charges, beginning of year	\$	19,267,070	\$	22,917,514
Contributions		1,396,007		3,001,060
Interest earned		955,130		712,470
Expenditures		(5,493,210)		(7,363,974)
Development cost charges, end of year	\$	16,124,997	\$	19,267,070

Development cost charges are funds restricted by bylaw for the purpose which they were collected from developers. The District holds these restricted funds in accounts (general, solid waste, water, and waste water) for the required use of the funds.

Notes to the Consolidated Financial Statements

December 31, 2023

12. Debt

Fund	Purpose	Bylaw No.	Maturity	Interest Rate	Balance	Additions	Principal Payments	Actuarial Adjustment	2023
			Year		Beginning of Year				
General	Facilities	2137	2023	2.75	14,168		9,945	4,210	13
	General Capital Works	2166	2023	3.85	52,525		36,903	15,622	-
	General Capital Works	2208	2023	3.85	50,618		35,564	15,054	-
	Synthetic Turf Field	2214	2023	3.85	21,465		15,081	6,384	-
	Fire Equipment	2534	2023	2.90	65,801		58,463	7,338	-
	Systems and Equipment	2208	2024	3.00	26,338		9,434	3,477	13,427
	Capital Leases	n/a	2025	n/a	66,837		21,551	-	45,286
	Tantalus Fire Hall Seismic Upgrade	2331	2025	0.91	416,208		131,687	4,649	279,872
	Forestry Building	1917	2026	1.53	740,568		93,112	81,285	566,171
	Business Park	1945	2027	3.90	1,033,247		118,446	74,235	840,566
	General Capital Works	2166	2027	3.39	544,247		72,967	28,525	442,755
	Fire Rescue Truck	2392	2027	3.15	95,778		15,562	2,479	77,737
	Business Park	2029	2029	2.25	1,280,761		97,387	64,770	1,118,604
	Flood Protection	2166	2029	3.00	60,841		5,629	2,075	53,137
	Bridge, Flood Protection, and Arena Lighting	2208	2029	3.00	449,900		41,621	15,340	392,939
	Bridge	2282	2029	3.00	187,215		17,320	6,384	163,511
	Aerial Apparatus	2533	2029	2.24	368,879		44,056	4,085	320,738
	Eagle Run Bridge	2282	2030	2.75	399,519		34,692	9,446	355,381
	Eagle Run Bridge	2331	2030	2.75	32,753		2,844	774	29,135
	ERP System, Arena Slab, Arena Wall Insulation	2392	2030	0.91	1,385,404		157,291	5,553	1,222,560
	ERP System	2444	2030	0.91	1,027,313		116,636	4,118	906,559
	Technology Transformation Project	2600	2030	0.91	871,984		99,000	3,495	769,489
	Technology Transformation Project	2687	2030	0.91	292,084		33,161	1,171	257,752
	Technology Transformation Project	2687	2031	1.98	928,918		92,194	2,074	834,650
	Roads and Drainage	2051	2031	1.47	607,736		40,923	17,691	549,122
	General Capital Works	2051	2031	2.10	365,636		30,142	5,849	329,645
	Arena Roof	2064	2031	1.47	387,581		26,098	11,282	350,201
	Forestry Building and Cleveland Ave Upgrade	2282	2032	3.15	454,278		34,182	5,444	414,652
	Technology Transformation Project	2774	2032	4.09	939,120		80,052	-	859,068
	General Capital Works	2208	2033	3.85	298,439		15,548	6,581	276,310
	Cleveland-Main to Victoria Streetscape	2530	2033	3.20	249,468		17,306	2,172	229,990
	Dike Construction and Rehabilitation	2051	2034	3.00	242,179		11,777	4,341	226,061
	General Capital Works	2051	2035	2.75	73,406		3,581	975	68,850
	Dike Construction and Rehabilitation	2536	2035	0.91	685,376		45,793	1,617	637,966
	Third Ave Pond Remediation	2599	2035	0.91	511,818		34,196	1,207	476,415
	Oceanfront R20 Peninsula Main Road	2465	2040	0.91	1,509,826		69,628	2,458	1,437,740
	Firehall #1	2777	2041	2.58	2,268,359		94,865	2,134	2,171,360
	Oceanfront R20 Peninsula Main Road	2775	2042	4.09	1,018,692		36,022	-	982,670
	Firehall #1	2777	2042	4.09	7,737,781		273,616	-	7,464,165
					\$ 27,763,066	\$ -	\$ 2,174,275	\$ 424,294	\$ 25,164,497

Notes to the Consolidated Financial Statements

December 31, 2023

12. Debt (continued)

Fund	Purpose	Bylaw No.	Maturity Year	Interest Rate	Balance		Principal Payments	Actuarial Adjustment	2023
					Beginning of Year	Additions			
Solid Waste									
	Landfill Capital Projects	2137	2023	2.75	22,304		15,672	6,632	-
	Landfill Capital Projects	2137	2025	2.75	68,955		17,448	4,751	46,756
	Landfill Vertical Expansion	2535	2025	0.91	2,020,899		639,406	22,575	1,358,918
	Landfill Vertical Expansion	2691	2025	0.91	928,980		293,927	10,377	624,676
	Landfill Vertical Expansion	2691	2026	1.25	116,259		27,484	618	88,157
	Landfill Vertical Expansion	2535	2029	2.24	1,158,124		138,317	12,826	1,006,981
					\$ 4,315,521	\$ -	\$ 1,132,254	\$ 57,779	\$ 3,125,488
Water									
	Watermain Replacement	2167	2023	3.85	36,727		25,804	10,923	-
	Water Systems	1944	2027	3.90	138,113		15,833	9,923	112,357
	Water Capital Works	2209	2028	3.85	401,507		42,529	18,003	340,975
	Water Systems	2052	2029	2.25	290,887		22,119	14,711	254,057
	PRV, Meters, Stations, and Mains	2167	2029	3.00	109,886		10,166	3,747	95,973
	Watermain Replacement	2209	2029	3.00	191,360		17,703	6,525	167,132
	Watermain Replacement	2283	2029	3.00	483,868		44,764	16,499	422,605
	Watermain Replacement	2283	2030	2.75	114,999		9,986	2,719	102,294
	Water Capital Works	2052	2031	1.47	321,930		21,678	9,371	290,881
	Water Systems	2138	2032	3.39	152,678		9,404	3,610	139,664
	Water Systems	2167	2032	3.39	188,785		11,629	4,464	172,692
	Watermain Replacement	2445	2032	3.15	360,881		27,155	4,325	329,401
	Watermain Replacement	2532	2035	0.91	284,491		19,008	671	264,812
	ICI / Multi- Family Water Meter Installation	2393	2040	0.91	641,680		29,592	1,045	611,043
					\$ 3,717,792	\$ -	\$ 307,370	\$ 106,536	\$ 3,303,886
Waste Water									
	Waste Water Treatment Plant - Mamquam	1756	2024	2.85	438,659		88,913	125,067	224,679
	Sewer Mains	1977	2028	3.79	249,573		21,728	15,898	211,947
	Sanitary Sewer Trunk Line	2156	2029	3.00	78,437		7,256	2,674	68,507
	Centrifuge, Trunk, Lift Station, and Crane	2211	2029	3.00	146,503		13,553	4,995	127,955
	Centrifuge, Trunk, Lift Station, and Crane	2211	2030	2.75	455,939		39,591	10,780	405,568
	Multi-Functional Heavy Duty Truck	2690	2031	1.98	298,643		29,640	667	268,336
	Trunk Sanitary Sewer Mains	2156	2032	3.39	283,307		17,451	6,699	259,157
	Sewer Capital Works	2168	2033	3.85	122,907		6,403	2,710	113,794
					\$ 2,073,968	\$ -	\$ 224,535	\$ 169,490	\$ 1,679,943
					\$ 37,870,347	\$ -	\$ 3,838,434	\$ 758,099	\$ 33,273,814

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2023

12. Debt (continued)

The principal repayments on long-term debt required in each of the five years and thereafter are as follows:

	2024	2025	2026	2027	2028	2029+	Actuarial Adjustment	Total
General	\$ 2,019,714	\$ 2,009,672	\$ 1,855,646	\$ 1,762,534	\$ 1,555,559	\$ 9,341,901	\$ 6,619,460	\$ 25,164,486
Solid Waste	1,116,581	1,116,581	165,801	138,317	138,317	138,317	311,577	3,125,491
Water	284,750	284,750	284,750	284,750	268,917	860,669	1,035,307	3,303,893
Waste Water	225,142	136,229	136,229	136,229	136,229	293,761	616,125	1,679,944
	\$ 3,646,187	\$ 3,547,232	\$ 2,442,426	\$ 2,321,830	\$ 2,099,022	\$ 10,634,648	\$ 8,582,469	\$ 33,273,814

Authorized but unissued debt totals \$62,009,818 (2022 - \$25,139,771).

Notes to the Consolidated Financial Statements

December 31, 2023

13. Provision for Post-Employment Benefits

Information regarding the District's obligations for post-employment benefits is as follows:

	2023	2022
Liability, beginning of year	\$ 1,705,800	\$ 1,609,400
Current service cost	257,700	196,900
Interest cost	88,500	47,200
Benefit payments	(232,200)	(184,000)
Amortization of net actuarial loss	25,200	36,300
Liability, end of year	\$ 1,845,000	\$ 1,705,800

The District provides future benefits to all of its eligible employees through a Sick Leave Plan, a Full Annual Vacation at Retirement Plan, and a Retirement Pay Plan (collectively as the "Plans"). The Sick Leave Plan entitles employees to twelve sick days per year, based on one day for each month of service, up to a maximum of 150 days for CUPE members and up to a maximum of 140 days for exempt employees. Sick leave benefits can be used by the employee at any point up to their retirement date.

The Full Annual Vacation at Retirement Plan entitles employees to receive full annual vacation or vacation pay on retirement irrespective of the month of retirement. This benefit would be paid out in full to the employee upon their retirement. The Retirement Pay Plan entitles an employee to two days pay for CUPE members and three days pay for exempt employees at the employee's normal rate of pay for each year or part of year worked. The benefit would be paid out in full to the employee upon their retirement.

There were no amendments to the above Plans during the year ended December 31, 2023.

Actuarial gains and losses are amortized over fourteen years (2022 - fourteen years), being the expected average remaining service period of the related employee group, commencing the year after the gain or loss arises.

	2023	2022
Accrued benefit obligation, end of year	\$ 2,153,600	\$ 1,954,600
Unamortized loss	(308,600)	(248,800)
Liability, end of year	\$ 1,845,000	\$ 1,705,800

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2023

Provision for Post-Employment Benefits (continued)

The most recent actuarial valuation of the District's employee future benefits was completed as at December 31, 2022. The significant actuarial assumptions adopted in measuring the District's accrued obligation are as follows:

	2023	2022
Discount rates	4.0%	4.5%
Expected wage and salary increases	3.5%	3.5%

14. Accumulated Surplus

	2023	2022
Appropriated surplus		
Statutory reserves (Schedule 3)	\$ 55,232,360	\$ 59,622,710
Internal borrowing (Schedule 3)	(11,865,200)	(4,872,838)
	43,367,160	54,749,872
Non-statutory reserves (Schedule 4)	21,124,916	12,430,782
	64,492,076	67,180,654
Equity in tangible capital assets	336,351,370	309,283,106
Accumulated remeasurement losses	(186,819)	-
Consolidated entities surplus	471,659	415,964
Accumulated surplus, end of year	\$ 401,128,286	\$ 376,879,724

Appropriated surplus is the amount of accumulated surplus that has been set aside by decision of Council for specified purposes. The statutory reserves have been established by bylaw in accordance with the Community Charter and their use is restricted by legislation. In the normal course of operations, these funds will be used to finance the future services or capital works for which they have been appropriated and can be employed for working capital, emergency expenditures, and to stabilize taxation and utility fee rates.

Investment in tangible capital assets is equal to the net book value of the tangible capital asset, less related long-term debt and asset retirement obligations. In the normal course of operations, the tangible capital assets will be consumed / used to provide services and the debt repaid by future period revenues.

15. Commitments and Contingencies

(I) Litigation

The District is currently involved in certain legal actions and other existing conditions involving uncertainty. Financial implications of potential claims against the District, resulting from such litigation, and that are not

Notes to the Consolidated Financial Statements

December 31, 2023

Commitments and Contingencies (continued)

covered by insurance, are accrued for the extent that amounts are likely to result in a liability and can be reasonably estimated.

As at December 31, 2023, there were legal claims in various stages of litigation for which management is unable to determine the outcome. The outstanding claims are not expected to result in a material loss to the District. As such, no provision has been made in the financial statements for these claims. Losses, if any, resulting from these actions will be recorded in the period the loss becomes likely and can be reasonably estimated.

(II) Municipal Pension Plan

The District and its employees contribute to the Municipal Pension Plan (a jointly trustee pension plan). The board of trustees, representing plan members and employers, is responsible for administering the plan, including investment of assets and administration of benefits. The plan is a multi-employer defined benefit pension plan. Basic pension benefits are based on a formula. As at December 31, 2023, the plan has about 240,000 active members and approximately 124,000 retired members. Active members include approximately 43,000 contributors from local governments.

Every three years, an actuarial valuation is performed to assess the financial position of the plan and adequacy of plan funding. The actuary determines an appropriate combined employer and member contribution rate to fund the plan. The actuary's calculated contribution rate is based on the entry age normal cost method, which produces the long-term rate of member and employer contributions sufficient to provide benefits for average future entrants to the plan. This rate may be adjusted for the amortization of any actuarial funding surplus and will be adjusted for the amortization of any unfunded actuarial liability.

The most recent actuarial valuation for the Municipal Pension Plan as at December 31, 2021, indicated a \$3,761 million funding surplus for basic pension benefits on a going concern basis. The District paid \$1,830,348. for employer contributions to the plan in fiscal 2023 (2022 - \$1,642,286). The next valuation will be as at December 31, 2024, with results available in 2025.

Employers participating in the plan record their pension expense as the amount of employer contributions made during the fiscal year (defined contribution pension plan accounting). This is because the plan records accrued liabilities and accrued assets for the plan in aggregate, resulting in no consistent and reliable basis for allocating the obligation, assets, and cost to individual employers participating in the plan.

(III) Demand notes

The District issues its debt instruments through the MFA. These demand notes are contingent in nature and are not reflected in the consolidated financial statements.

Notes to the Consolidated Financial Statements

December 31, 2023

Commitments and Contingencies (continued)

(IV) Squamish Oceanfront front ender and municipal share agreements

As permitted under the Local Government Act, the District entered into a Development Cost Charge ("DCC") Front Ender Agreement and Municipal Share Agreements in 2015 for specified infrastructure projects necessary for the development of the Oceanfront Lands sold to Matthews Southwest and Bethel Lands.

The Agreements provided for the reimbursement of a maximum of \$33,915,438 over a 20 year period for specified DCC projects that the Developer pays for and builds on behalf of the District. Within the agreements there are conditions and restrictions that may limit the reimbursement paid by the District. A key restriction is that reimbursement for most of the specified projects may not exceed 78% of DCC collections received by the District per quarter, during the time when invoices are outstanding. Further, any amounts outstanding at the end of the 20 year term are forgiven.

Only projects identified in the Municipal Share Agreements are eligible for reimbursement of the municipal share portions of the project and only at the time of project completion. The District has discretion to fund and build any project identified in the Agreements and the Developer is not bound to proceed with development activities.

16. Financial Plan

The financial plan amounts presented throughout the consolidated financial statements are presented on a consolidated basis. The District's Financial plan bylaw 2961, 2023 adopted by Council on March 21, 2023 does not incorporate the operation of its two controlled civic corporations: SPL and SSC. The following reconciles the District's Financial Plan bylaw 2961, 2023 to the financial plan figures as presented on the financial statements

	Financial Plan		Presented Financial
	Bylaw	Civic Corporations	Plan
Revenues	\$ 69,235,997	\$ 436,014	\$ 69,672,011
Expenses	69,313,035	209,434	69,522,469
Annual surplus (deficit) before Other	\$ (77,038)	\$ 226,580	\$ 149,542
Other	36,464,000	-	36,464,000
Annual surplus	\$ 36,386,962	\$ 226,580	\$ 36,613,542

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2023

17. Taxation and User Fees

Collection for District

The following shows the collection in 2023 for District purposes:

		Financial Plan		
		2023	2023	2022
Taxation				
General property levies	\$	37,220,000	\$ 36,952,822	\$ 33,838,930
Business improvement area		95,000	93,589	93,434
		37,315,000	37,046,411	33,932,364
Other property levies				
Grants-in-lieu of property levies		677,100	1,292,538	1,054,221
Hotel tax		180,000	696,680	670,781
1% utility revenue		305,000	337,993	302,649
Penalties and interest on property levies		395,000	522,176	464,809
		1,557,100	2,849,387	2,492,460
		38,872,100	39,895,798	36,424,824
Utility user fees				
Solid waste		6,032,300	6,047,187	5,979,382
Water		5,483,000	5,815,893	5,630,044
Waste water		7,094,000	7,638,301	7,390,061
		18,609,300	19,501,381	18,999,487
	\$	57,481,400	\$ 59,397,179	\$ 55,424,311

Collection for other agencies

The following amounts were collected on behalf of other taxing authorities and are not included on the District's Consolidated Statement of Operations and Accumulated Surplus:

		2023		2022
Province of BC School Taxes	\$	18,853,870	\$	16,490,358
BC Assessment Authority		602,487		527,892
Municipal Finance Authority		3,279		2,742
Squamish-Lillooet Regional District		2,460,155		2,539,294
Sea to Sky Regional Hospital District		465,523		452,483
	\$	22,385,314	\$	20,012,769

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2023

18. Government Transfers

	2023		2022
Operating			
Federal	\$ 961,442	\$	961,085
Provincial	7,563,461		836,808
Other	38,056		56,139
Total operating	8,562,959		1,854,032
Capital			
Provincial	2,029,647		1,742,732
Other	50,000		115,000
Total capital	2,079,647		1,857,732
	\$ 10,642,606	\$	3,711,764

In March 2023 the District received a \$6,285,000 grant from the Province through the Growing Communities Fund. At December 31, 2023 none of the grant funds were spent. As there are no stipulations that give rise to a liability, these amounts have been recognized as revenue in the period and have been carried forward as a non-statutory reserve (Schedule 4). Once a statutory reserve is established, the funds will be transferred to the statutory reserve.

19. Trusts

The District trust funds account for assets that must be administered as directed by agreement or statute for certain beneficiaries. In accordance with PSAS, trust funds are not included in the District's consolidated financial statements.

The District operates the Mount Garibaldi Cemetery and maintains the Cemetery Care Fund in accordance with the Cemeteries and Funeral Services Act. The following trust funds are administered by the District and are excluded from these consolidated financial statements

Cemetery Care Fund financial position at December 31, 2023:

	2023		2022
Financial assets			
Investments	\$ 318,117	\$	287,948
Liabilities			
Cemetery care fund	\$ 318,117	\$	287,948

Notes to the Consolidated Financial Statements

December 31, 2023

Segmented Information (Continued)

20. Segmented Information

The District is a diversified municipal government that provides a wide range of services to its citizens, including General Government, Protective Services, Transportation and Transit, Economic and Community Development, Recreation, Parks, Trails and Library, Public Health, Water, Waste Water, and Solid Waste Utilities. For management reporting purposes, the District's operations and activities are organized and reported by Fund. Funds were created for the purpose of recording specific activities to attain certain objectives in accordance with special regulations, restrictions, or limitations.

Municipal services are provided by departments and their activities reported within these funds. Certain functions that have been separately disclosed in the segmented information, along with services they provide, are as follows:

General Government

General Government is comprised of Council and related support services provided by the Administration and Finance departments, as well as all operations and maintenance costs relating to Municipal Hall and grants to community organizations.

Protective Services

Protective Services is comprised of police, fire, emergency management planning, bylaw enforcement, animal control, and building inspection.

Transportation and Transit

Transportation and Transit is a broad function comprised of engineering departments and public works crews engaged in the maintenance and improvements to the road systems, drainage, sidewalk, flood protection, fleet maintenance, works yard maintenance, and other planning and maintenance activities. In addition, this function includes transit services and airport operations.

Economic and Community Development

Economic and Community Development is comprised of planning and land use development, environmental planning, economic development and events management with the common goal of developing Squamish into a healthy, vibrant, and economically viable community. In addition, the District's civic corporation, Squamish Sustainability Corporation, has been consolidated into this segment for reporting purposes.

Recreation, Parks, Trails and Library

Recreation, Parks, Trails, and Library is comprised of the arena and community centre, seniors centre, youth centre, and an extensive network of parks and trail systems throughout the community. In addition, the District's civic corporation, the Squamish Public Library, has been consolidated into this segment for reporting purposes.

District of Squamish

Notes to the Consolidated Financial Statements

December 31, 2023

Segmented Information (Continued)

Health, Social and Housing

Health, Social and Housing is comprised of municipal cemetery services and other health, social, and housing initiatives.

Water and Waste Water Utilities

The Water and Waste Water Utilities is comprised of the water and waste water system networks, storm mains, and pump stations.

Solid Waste Utility

The Solid Waste Utility is comprised of garbage, recycling, organic waste collection services, as well as the operation of the landfill.

21. Comparative Amounts

Certain amounts on the consolidated financial statements for the year ended December 31, 2022 have been restated to conform to the presentation adopted in the current year.

22. Subsequent Event

On January 31, 2024 the sale of District owned property (land and building) located at 42000 Loggers Lane closed. The sale proceeds received by the District was \$17,490,000 and the carrying value of the property was \$308,000 resulting in a gain of \$17,182,000 that will be recognized in the 2024 financial statements.

District of Squamish
Schedule 1 - Tangible capital assets

For the year end December 31	Land	Land Improvements	Buildings	Furniture, Vehicles and Equipment	Transportation Infrastructure	Solid Waste Infrastructure	Water Infrastructure	Waste Water Infrastructure	Assets under Construction	2023
COST										
Opening Balance	\$ 71,887,386	\$ 46,482,018	\$ 58,608,646	\$ 25,003,975	\$ 117,250,452	\$ 13,523,623	\$ 71,898,096	\$ 69,221,490	\$ 26,040,416	\$ 499,916,102
Add: Additions	-	1,988,680	985,251	1,477,667	6,907,525	-	3,354,598	5,001,163	23,057,394	42,772,278
Less: Disposals	-	-	(500,993)	(157,437)	-	-	-	-	-	(658,430)
Less: Transfers	-	-	-	-	-	-	-	-	(7,856,120)	(7,856,120)
Closing Balance	71,887,386	48,470,698	59,092,904	26,324,205	124,157,977	13,523,623	75,252,694	74,222,653	41,241,690	534,173,830
ACCUMULATED AMORTIZATION										
Opening Balance	-	12,369,194	22,569,303	13,550,039	47,715,816	5,556,415	23,613,564	26,737,429	-	152,111,760
Add: Amortization	-	1,123,323	1,268,800	2,104,354	3,861,912	1,193,499	1,334,024	1,428,560	-	12,314,472
Less: Accumulated Amortization on Disposals	-	-	(371,490)	(153,592)	-	-	-	-	-	(525,082)
Closing Balance	-	13,492,517	23,466,613	15,500,801	51,577,728	6,749,914	24,947,588	28,165,989	-	163,901,150
Net Book Value, year ended 2023	\$ 71,887,386	\$ 34,978,181	\$ 35,626,291	\$ 10,823,404	\$ 72,580,249	\$ 6,773,709	\$ 50,305,106	\$ 46,056,664	\$ 41,241,690	\$ 370,272,680

District of Squamish
Schedule 2 - Statement of Operations by Segment

For the year end December 31	District of Squamish										
	General Government	Protective Services	Transportation & Transit	Economic & Community Development	Parks Recreation Culture	Health Social & Housing	Solid Waste Management	Water Services	Waste Water Services	2023	2022
Revenue											
Taxation (Note #17)	\$ 37,046,411	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 37,046,411	\$ 33,932,364
Other property levies (Note #17)	2,152,707	-	-	696,680	-	-	-	-	-	2,849,387	2,492,460
Utility user fees (Note #17)	-	-	-	-	-	-	-	-	-	19,501,381	18,999,487
Other revenue from own sources	34,886	82,730	1,558,145	793,816	1,001,687	8,766	6,047,187	7,638,301	-	3,485,426	1,874,292
Other fees and charges	578,482	1,704,485	895,689	1,752,429	623,938	7,240	309,495	22,268	-	5,972,970	5,797,106
Government transfers for operating (Note #18)	7,241,942	597,383	73,959	190,201	1,500	457,974	-	-	-	8,562,959	1,854,032
Investment income	5,745,068	-	-	-	20,346	-	60,060	172,221	-	6,106,720	3,307,362
	52,799,496	2,384,608	2,527,793	3,433,126	1,647,471	473,980	6,422,138	7,832,790	-	83,525,254	68,257,103
Expenses											
Payroll and benefits	8,611,201	5,583,798	3,869,744	2,917,263	4,601,231	13,331	220,503	861,458	1,041,998	27,720,527	24,362,333
Operating expenses	3,407,896	6,669,832	3,219,632	2,159,116	2,802,695	494,165	4,500,307	3,494,824	28,696,645	25,093,792	25,093,792
Debt service interest	430,809	386,448	41,478	188,266	6,971	-	88,641	176,563	169,796	1,488,972	1,302,151
Amortization expense	8,257,385	-	-	4,655	96,350	-	1,193,499	1,334,024	1,428,558	12,314,471	11,315,317
Accretion expense	10,646	-	-	-	-	-	146,763	5,945	-	163,354	159,970
	20,717,937	12,640,078	7,130,854	5,269,300	7,507,247	507,496	6,149,713	6,135,176	70,383,969	70,383,969	62,233,563
Annual surplus (deficit) before Other	32,081,559	(10,256,470)	(4,603,061)	(1,836,174)	(5,859,776)	(33,516)	272,425	1,677,684	1,697,614	13,141,285	6,023,540
Other											
Government transfers for capital (Note #18)	160,566	-	319,149	468,903	-	-	-	1,131,029	2,079,647	1,857,732	1,857,732
Developer cost charge capital revenues	-	-	3,263,313	-	-	-	-	289,917	5,493,211	7,363,974	7,363,974
Developer contributed assets	902,294	-	-	1,361,073	-	-	-	85,616	3,758,626	2,989,212	2,989,212
Gain on disposal of tangible capital assets	(115,868)	-	-	-	(3,845)	-	-	-	(119,713)	(40,705)	(40,705)
Other capital revenues	-	-	-	-	2,794	-	-	65,016	82,525	88,906	88,906
	946,992	-	3,602,462	1,829,976	(1,051)	-	-	3,397,640	11,294,096	11,294,096	12,239,121
Annual Surplus (Deficit)	\$ 33,028,551	\$ (10,256,470)	\$ (1,000,599)	\$ (6,198)	\$ (5,860,827)	\$ (33,516)	\$ 272,425	\$ 5,075,324	\$ 3,215,691	\$ 24,435,381	\$ 18,262,661

District of Squamish
Schedule 3 - Continuity of Reserves

Reserve Fund Transactions	Balance, beginning of year	Contributions	Investment income	Expenditures	Transfers	Internal Borrowing	2023
Sinking Fund Surplus - General BL 900	\$ 308,085	\$ -	\$ 17,090	\$ -	\$ -	\$ -	\$ 325,175
Sinking Fund Surplus - Water BL 900	654,565	-	36,310	-	-	-	690,875
Sinking Fund Surplus - Waste Water BL 900	768,837	-	42,650	-	-	-	811,487
Land Sale - BL720	2,311,515	-	98,590	(1,097,684)	(81,100)	-	1,231,321
Equipment Replacement BL 538	7,826,622	1,118,400	455,260	(357,166)	-	-	9,043,116
Community Works Fund BL 1950	4,387,894	956,442	145,130	(3,632,570)	(916,000)	-	940,896
Capital Rehab - General BL 2346	7,462,782	2,660,000	146,660	(3,562,899)	(43,088)	(6,907,755)	(244,300)
Capital Rehab - Water BL 2347	8,542,038	2,706,858	499,640	(1,965,934)	1,352	-	9,783,954
Capital Rehab - Waste Water BL 2348	11,797,523	2,551,514	583,790	(4,831,256)	(52,662)	(389,085)	9,659,824
Capital Rehab - Solid Waste BL 2349	2,236,737	371,341	238,760	(302,290)	-	-	2,544,548
Municipal Off-Street Parking Facilities Reserve Fund BL 2553	608,299	-	33,740	-	-	-	642,039
Alternative Forms of Transportation Reserve Fund BL 2553	1,004,780	65	55,740	-	-	-	1,060,585
Affordable Housing BL 1951	1,193,737	-	64,420	(65,000)	-	-	1,193,157
Carbon Neutral BL 2079	334,689	153,082	20,990	(65,648)	-	-	443,113
Vanoc Legacy BL 2101	7,960	-	440	-	-	-	8,400
Parkland in Lieu BL 720	43,648	-	2,420	-	-	-	46,068
Corridor Trail MOU BL 750	221,699	-	12,300	-	-	-	233,999
Environmental Reserve Fund BL 2640	231,904	101,250	10,370	(90,000)	-	-	253,524
General Operating Reserve BL 2788	9,679,396	411,099	406,320	(722,401)	(506,675)	(4,568,360)	4,699,379
Total	\$ 59,622,710	\$ 11,030,051	\$ 2,870,620	\$ (16,692,848)	\$ (1,598,173)	\$ (11,865,200)	\$ 43,367,160

District of Squamish

Schedule 4 - Continuity of Non-Statutory Reserves

Non-Statutory Reserve Transactions	Balance, beginning of year	Contributions	Investment income	Expenditures	Transfers	2023
Community Amenity Contributions	\$ 6,101,482	\$ 1,361,076	\$ 357,200	\$ (686,764)	-	\$ 7,132,994
Airport	136,732	-	7,630	(17,513)	19,106	145,955
Grants (unrestricted carry forward)	-	256,717	7,120	-	-	263,837
Growing Communities Fund Grant	-	6,285,000	174,320	-	-	6,459,320
Cyclic Expenditures	194,437	64,000	11,870	(25,000)	-	245,307
Future Expenditures	1,558,727	88,360	54,000	(795,688)	(79,409)	825,990
Forestry Building	737,365	113,810	44,060	-	-	895,235
Protective Services	2,658,593	820,500	159,000	(405,000)	-	3,233,093
Child Care Amenities	18,977	-	-	(18,977)	-	-
Public Art Committee	428,654	-	23,780	-	235,800	688,234
Covid-19 Restart Grant	102,928	-	-	(102,928)	-	-
Library	273,200	-	15,150	-	-	288,350
Transit	200,000	668,044	29,620	-	-	897,664
Other Provisions	19,687	-	1,080	-	28,170	48,937
Total	\$ 12,430,782	\$ 9,657,507	\$ 884,830	\$ (2,051,870)	\$ 203,667	\$ 21,124,916



Appendix **B**

Fees and Charges Bylaw

Schedule 23 –

Water Rates

Fees and Charges Bylaw 2012, 2007
(As amended by Bylaw No. 2716, 2020)

1	Single Unit Dwelling within/outside the boundaries of the District of Squamish, each unit	\$490
2	Apartment, Townhouse, Fourplex, Triplex or Live-Work, each unit	\$490
3	Secondary Suite, Accessory Dwelling Unit, Multi-Unit Flex Unit, each unit <i>**When permitted and licensed for Short-term Rental Accommodation under a TUP, the same utility rate for the dwelling unit above will be applied. (Amended by Bylaw 2958, 2023)</i>	\$390
4	Not for profit seniors housing, each unit	\$390
5	Removed as per Bylaw 2958, 2023 -	
6	Home Occupation - Beauty Parlours, Barber Shops, Health Spa & Services - for each chair over one	\$490 \$240
7	Home Occupation businesses except for those specifically listed	\$0
8	Tourist Accommodation, Hostel, Hotels, Motels, per Accommodation Unit - With kitchen facilities - Without kitchen facilities	\$240 \$82
9	Barber Shops, Beauty Parlors & Health Spa and Services For each chair over one	\$490 \$240
10	Café, Restaurant, Coffee Shop, Bakeries, Dining Room and Public Lounge and Cocktail Bar In addition, per seat	\$630 \$18
11	Dentists In addition for each chair	\$318 \$166
12	Greenhouses, Nurseries, Cannabis Production , Agriculture and Animal Farms not in any other category	\$795
13	Pool Rooms with toilet and washroom facilities	\$633
14	Public Garages and Service Stations with less than 1000 sq. ft. of retail - In addition retail 1000-5000 sq. ft. - In addition retail over 5000 sq. ft. - In addition car wash for each bay/washing station	\$1,200 \$638 \$955 \$240

15	Church Halls and Church Residences (each)	\$490
16	Stores, Banks, Theatres, Offices, Office Buildings, Public Halls, Clubs, Medical Clinics, and all other commercial undertakings not specifically listed. Less than 1000 sq. ft. 1000 - 5000 sq. ft. Over 5000 sq. ft.	\$318 \$638 \$955
17	Laundries, except where on an industrial rating	\$1,585
18	Mills, Breweries, Wineries, Distilleries and other small industrial users.	\$1,585
19	Commercial Swimming pool and/or Hot tub(s)	\$793
20	Campgrounds - centralized washroom, per un-serviced site - fully serviced, camp or recreational vehicle site - sani-stations and or dump stations - laundry facilities - public washroom, per fixture	\$ 0 \$120 \$490 \$1,585 \$160
21	Machine Shops	\$1,430
22	Hospital or homes for aged or chronically ill For each rated bed capacity	\$128
23	School, per classroom	\$318
24	Temporary water Service during construction (Building size in square meters of gross floor area) Up to and including 500 Over 500 but not exceeding 2,000 Over 2,000 but not exceeding 9,000 Over 9,000 but not exceeding 24,000 Over 24,000 but not exceeding 45,000	\$220 \$430 \$1,090 \$1,630 \$2,160

METERED –Industrial, Commercial and Institutional

1	Per cubic meters Minimum Monthly Charge for metered service	\$0.79 \$217
2	<p>MONTHLY RENT FOR METER, IN ADDITION TO ALL ABOVE TOLLS:</p> <p>Up to 3/4" meter Up to 1" meter Up to 1 1/2" meter Up to 2" meter Up to 3" meter Up to 4" meter Up to 6" meter Up to 8" meter Up to 10" meter</p>	<p>\$6.65 \$15.50 \$24.34 \$31.10 \$82.26 \$141.44 \$213.20 \$258.96 \$354.64</p>
3	Extra charge for inaccessible meter reading (per month)	\$84
4	<p>TURNING WATER SUPPLY OFF AND ON</p> <p>When any service has been discontinued for any premise for non-payment of rent or rate, or infringement of terms of this bylaw, or at the request of the consumer, or the owner of the premises, a fee of fifty dollars (\$50.00) shall be paid before the service will be resumed.</p> <p>A charge of fifty dollars (\$50.00) will be charged for turning the water when requested to do so by the consumer or owner of the property.</p>	
5	<p>When the consumer or owner of the property requests the water to be turned off during a time other than the regular working hours, the consumer or property owner making the request for turning the water off shall be charged the actual cost to the Municipality for turning off the water, such cost to take into consideration the overtime or call out time of the manpower involved in turning off the water.</p>	

METERED – Multi- Family Residential

1	<p>Minimum Base Rate - annual water usage less than or equal to 112 M3 / apartment unit.</p> <p>For annual water usage greater than 112 M3/apartment unit. Per cubic meter.</p>	<p>\$171</p> <p>\$1.52</p>
2	<p>For not for profit seniors housing; Minimum Base Rate - annual water usage less than or equal to 112 M3 / apartment unit.</p> <p>For annual water usage greater than 112 M3/apartment unit. Per cubic meter.</p>	<p>\$171</p> <p>\$1.52</p>
3	<p>Extra charge for inaccessible meter reading (per month)</p>	<p>\$84</p>
4	<p>TURNING WATER SUPPLY OFF AND ON</p> <p>When any service has been discontinued for any premise for non-payment of rent or rate, or infringement of terms of this bylaw, or at the request of the consumer, or the owner of the premises, a fee of fifty dollars (\$50.00) shall be paid before the service will be resumed.</p> <p>A charge of fifty dollars (\$50.00) will be charged for turning the water off when requested to do so by the consumer or owner of the property.</p>	
5	<p>When the consumer or owner of the property requests the water to be turned off during a time other than the regular working hours, the consumer or property owner making the request for turning the water off shall be charged the actual cost to the Municipality for turning off the water, such cost to take into consideration the overtime or call out time of the manpower involved in turning off the water.</p>	

Schedule 24 – Wastewater Rates

Fees and Charges Bylaw 2012, 2007

(As amended by Bylaw No. 2914, 2022)

1	For all types of uses minimum charge Per classification	\$615
2	Single Unit Dwelling, each unit	\$615
3	Apartment, Townhouse, Fourplex, Triplex or Live-Work each unit	\$615
4	Secondary Suite, Accessory Dwelling Unit, Multi-Unit Flex Unit, each unit <i>**When permitted and licensed for Short-term Rental Accommodation under a TUP, the same utility rate for the dwelling unit above will be applied. (Amended by Bylaw 2958, 2023)</i>	\$490
5	Not for profit seniors housing, each unit	\$490
6	Hospitals For each bed unit	\$305
7	Tourist Accommodation, Hostel, Hotels, Motels, per Accommodation Unit With kitchen facilities - with bath Without kitchen facilities - with bath Without kitchen facilities - without bath	\$305 \$245 \$183
8	Public House Licenses (Beer parlors, Breweries, Wineries, Distilleries)	\$3,670
9	Restaurants and Bakeries	\$1,040

10	Retail stores, Commercial Halls, Banks, Theatre and all other commercial undertakings not specifically listed. Less than 1000 sq. ft. 1000 - 5000 sq. ft. Over 5000 sq. ft.	\$ 615 \$1,040 \$1,530
11	Office Buildings For each office	\$123
12	Offices For rent other than in an office building	\$123
13	Schools For each classroom	\$615
14	Churches Church Halls (where separate from church)	\$615 \$615
15	Commercial Laundries, including Laundromats 1 to 6 washers Each additional washer	\$1,835 \$ 305
16	Public Garage and Service Stations with less than 1000 sq. ft. of retail In addition retail 1,000-5,000 square feet In addition retail over 5,000 square feet In addition car wash for each bay or washing station	\$1,310 \$1,040 \$1,530 \$ 245

17	Warehouses With 1 to 5 employees With more than 5 employees	\$615 \$1,040
18	Bowling Alleys, Pool Rooms, Curling Rinks Golf Courses and Club Houses With snack bar Without snack bar	\$2,080 \$1,040
19	Dentist's, Physician's and Surgeon's offices With one dentist, physician or surgeon With more than one dentist, physician or surgeon	\$1,040 \$1,560
20	Barber Shops, Beauty Parlors and Health Spa and Services	\$1,040
21	Work Shops and Small Industries For the first 5 employees For each additional employee	\$1,040 \$ 93
22	Removed by Bylaw 2958, 2023	
23	Home Occupation businesses except for those specifically listed	\$ 0
24	Campgrounds Centralized washroom, per unserviced site Fully serviced, camp or recreational vehicle site Sani Stations and/or dump stations Laundry facilities, per washer	\$ 152 \$ 305 \$1,040 \$ 305
25	Greenhouses, Nurseries, Cannabis Production , Agriculture and Animal Farms not in any other category	\$1,040

26	<p>Blockage minimum</p> <p>A fee to recover actual cost to the Municipality for the clearing a sewer blockage.</p> <p>The blockage minimum fee plus actual costs of labour and equipment.</p> <p>The municipality must demonstrate that the sewer blockage was due to consumer or property owner and the fee can be charged to the consumer or property owner.</p>	\$200
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SEPTIC TANK OR OTHER SEWERAGE DUMP FEES:

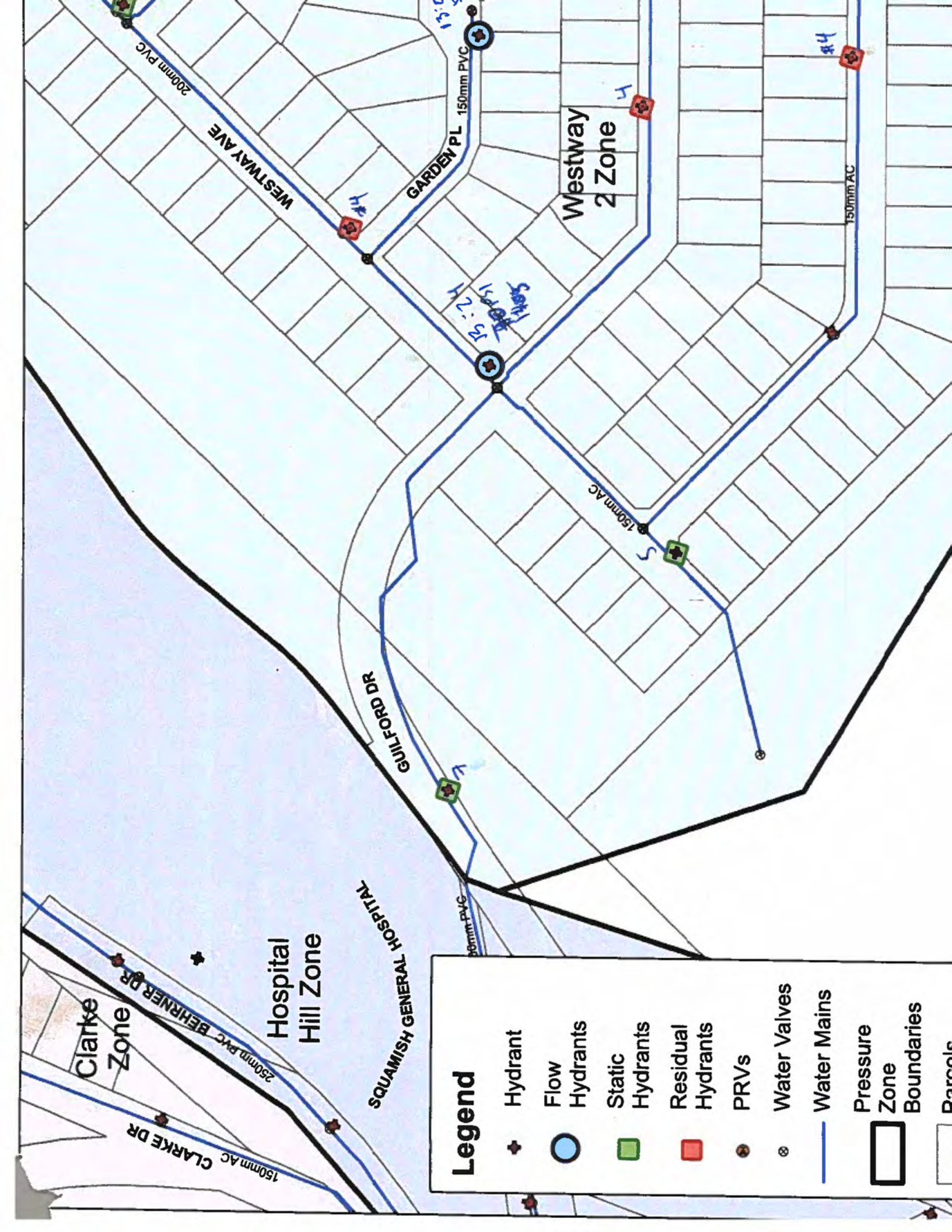
SOURCE OF SEPTIC TANK OR OTHER

SEWERAGE EFFLUENT

1	<p>Septic tank effluent where a septic field is operated in conjunction with the septic tank(s)</p>	\$16.60 per cubic meter
2	<p>Holding tank effluent for properties which are unable to support a septic field due to health, environmental or lot size restrictions</p>	\$16.60 per cubic meter
3	<p>Permit for access to District sewerage tipping facility during a Special Event, as defined in Schedule 21 of this Bylaw</p>	\$125 / day

APPENDIX

E HYDRANT FLOW TEST SET



Legend

Hydrant

Flow Hydrants

Static Hydrants

Residual Hydrants

PRVs

Water Valves

Water Mains

Pressure Zone Boundaries

Parcels



Clarke Zone

Hospital Hill Zone

Westway 2 Zone

WESTWAY AVE
200mm PVC

GARDEN PL
150mm PVC

GULLFORD DR

SQUAMISH GENERAL HOSPITAL

CLARKE DR
150mm AC

BEHRNER DR
250mm PVC

150mm AC

150mm AC

SOUTH
150mm PVC
H 2:15

H4

H4



Legend

- ⊕ Hydrant
- Flow Hydrants
- Static Hydrants
- Residual Hydrants
- ⊙ PRVs
- ⊗ Water Valves
- Water Mains
- Pressure Zone Boundaries

Flow 3:00

150mm DI
10.0.02

150mm DI
07.1.11

SIXTH AVE

FOURTH AVE

FIFTH AVE

SIXTH AVE

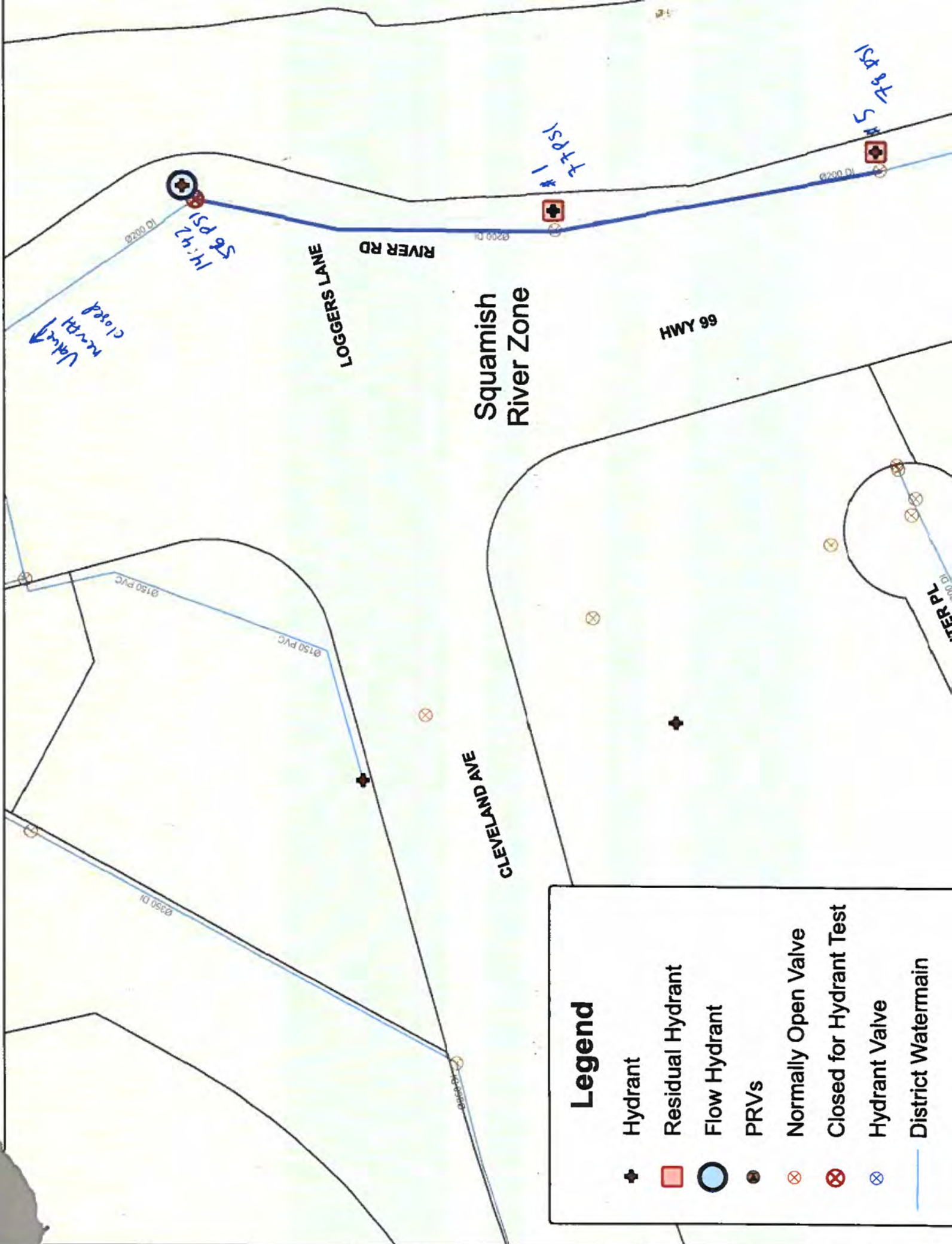
SEVENTH AVE

Squamish River Zone









WINNIPEG ST

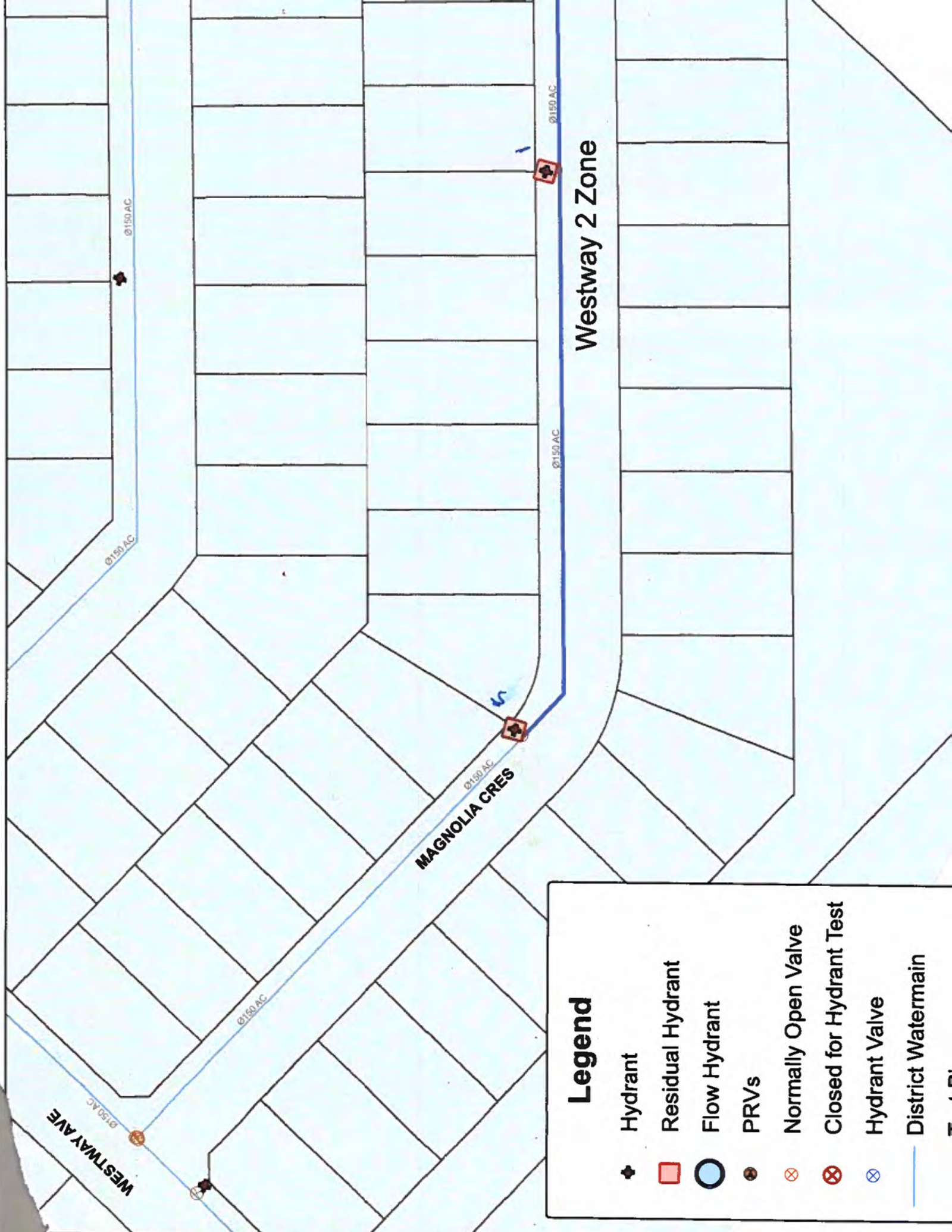
VICTORIA ST

H



Legend

-  Hydrant
-  Residual Hydrant
-  Flow Hydrant
-  PRVs
-  Normally Open Valve
-  Closed for Hydrant Test
-  Hydrant Valve
-  District Watermain

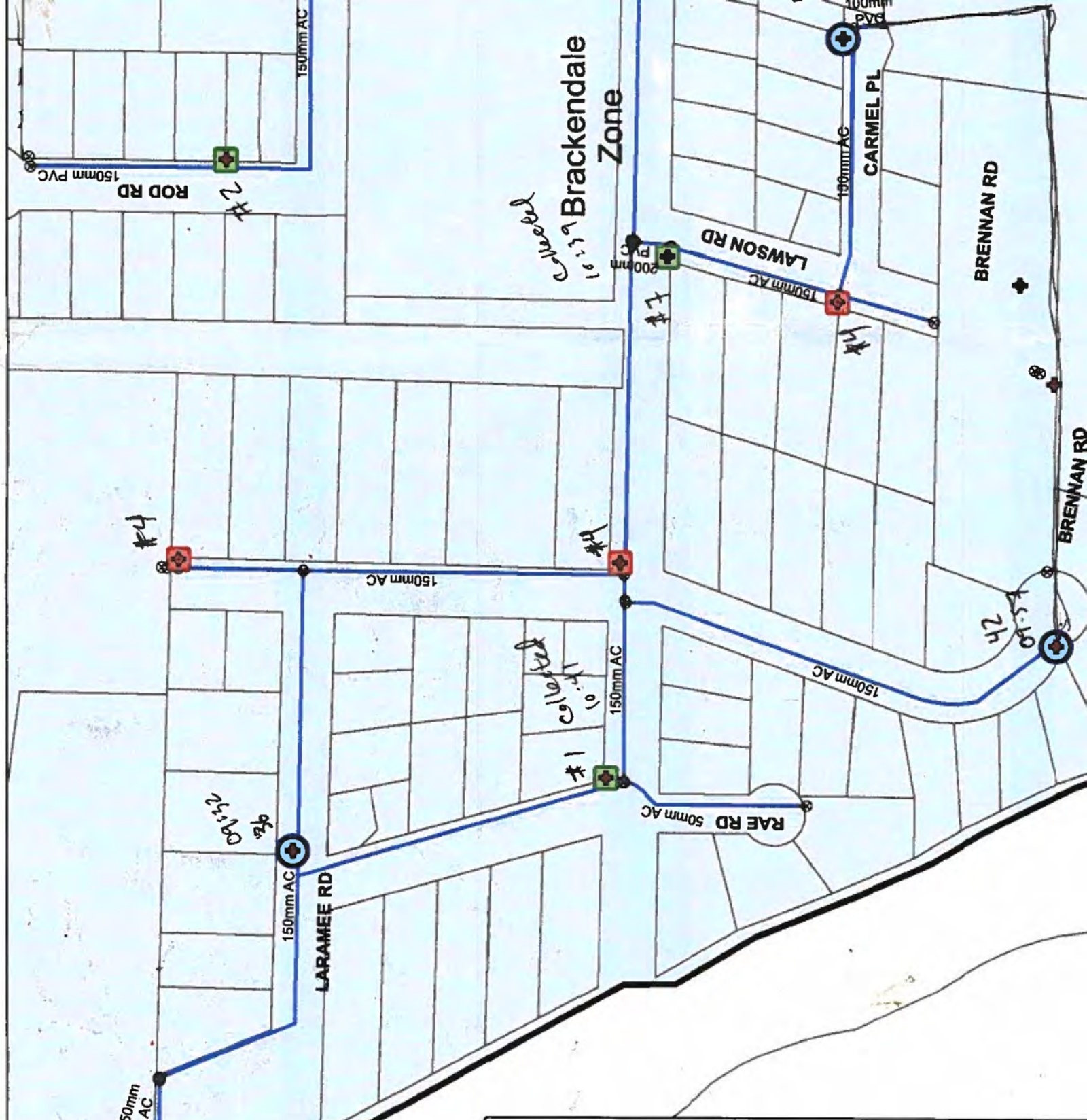


Legend

- Hydrant
- Residual Hydrant
- Flow Hydrant
- PRVs
- Normally Open Valve
- Closed for Hydrant Test
- Hydrant Valve
- District Watermain

Legend

- Hydrant
- Flow Hydrants
- Static Hydrants
- Residual Hydrants
- PRVs
- Water Valves
- Water Mains
- Pressure Zone Boundaries



Alice Lake Zone

NEWPORT RIDGE DR

WENDA PL

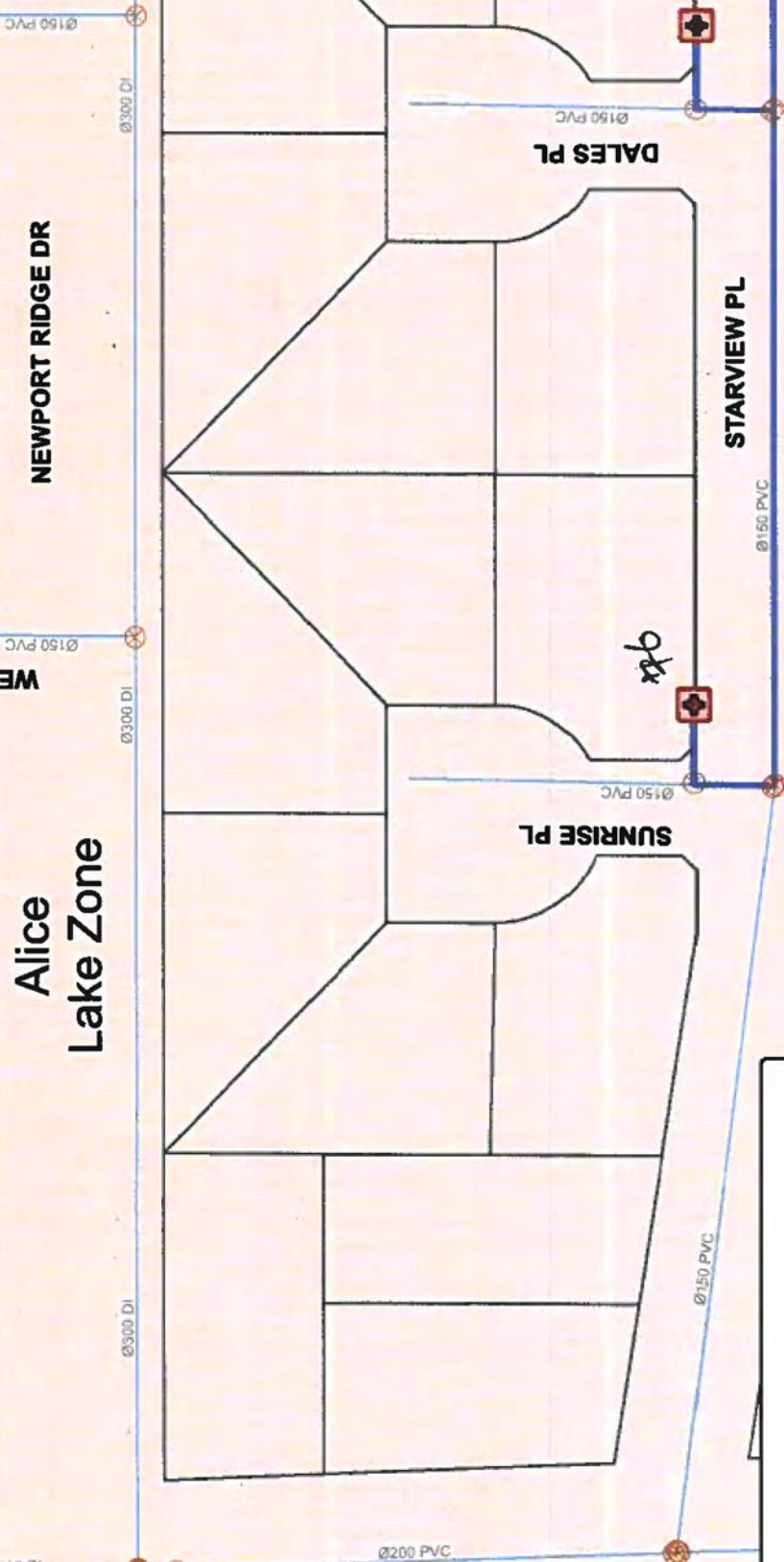
DALES PL

SUNRISE PL

STARVIEW PL

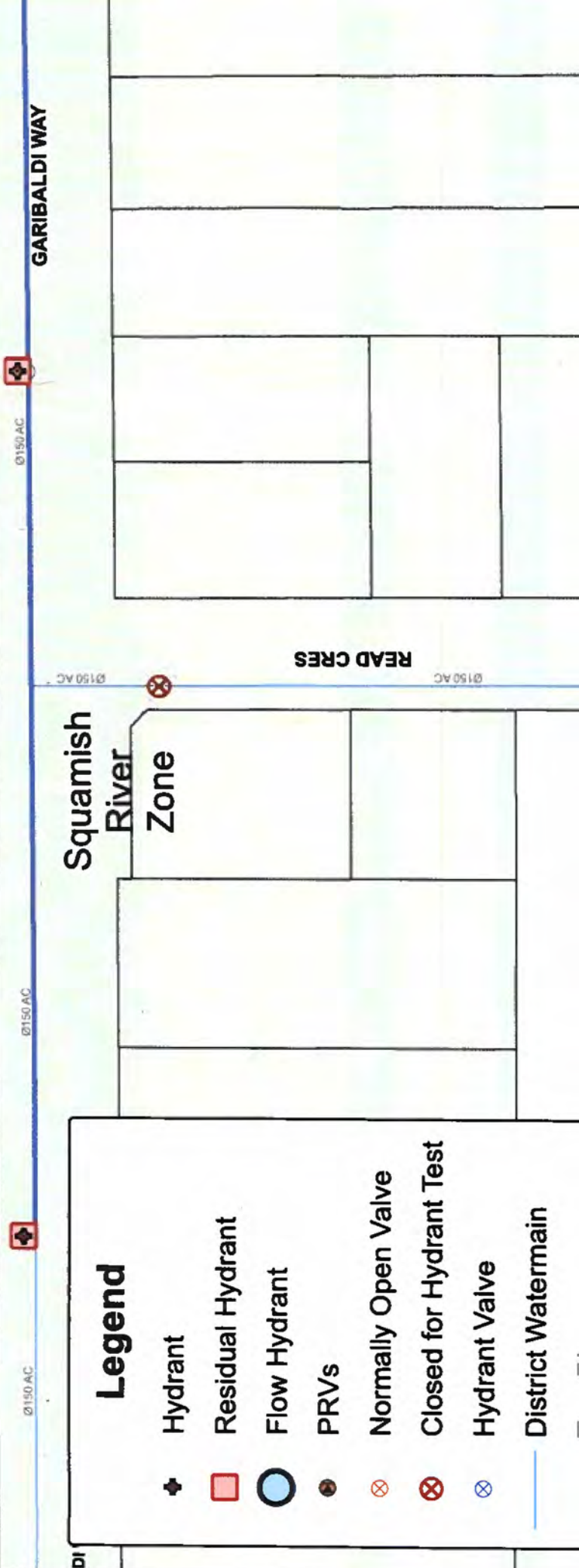
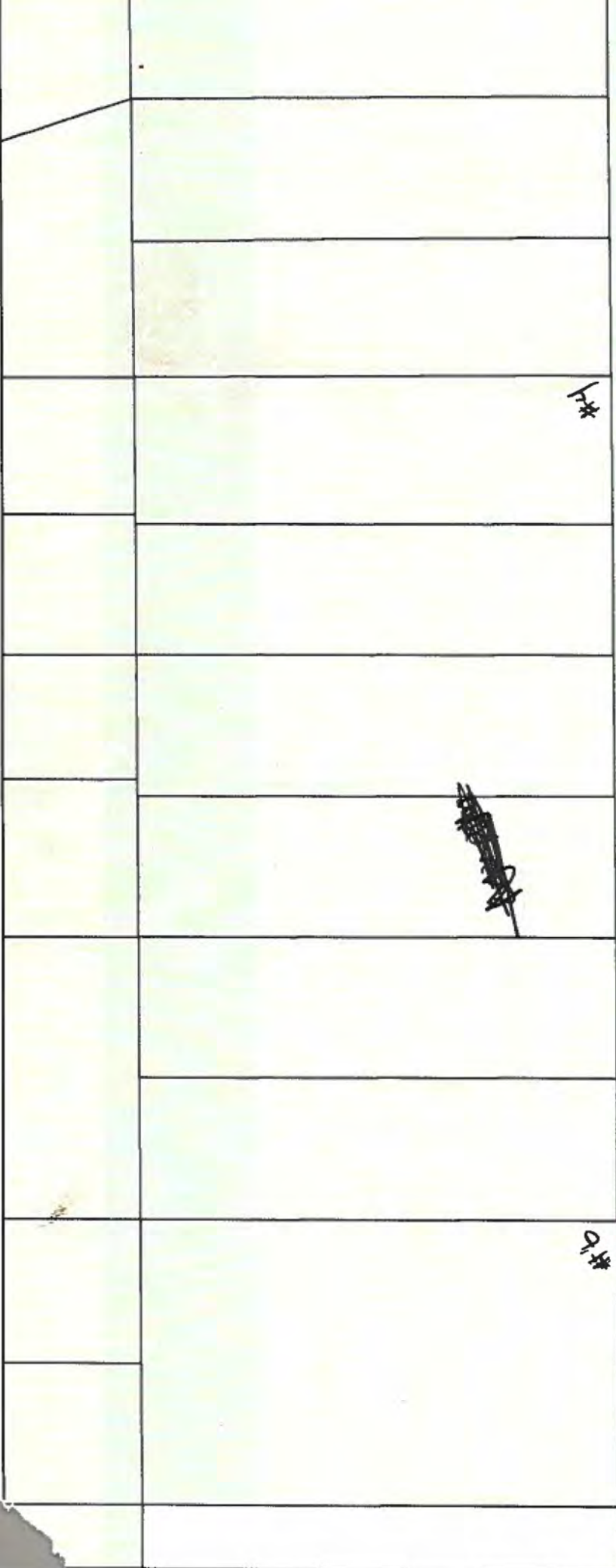
#4

qtb



Legend

- Hydrant
- Residual Hydrant
- Flow Hydrant
- PRVs
- Normally Open Valve
- Closed for Hydrant Test
- Hydrant Valve
- District Watermain



GARIBALDI WAY

Ø150 AC

Ø150 AC

Ø150 AC









Ø150 AC

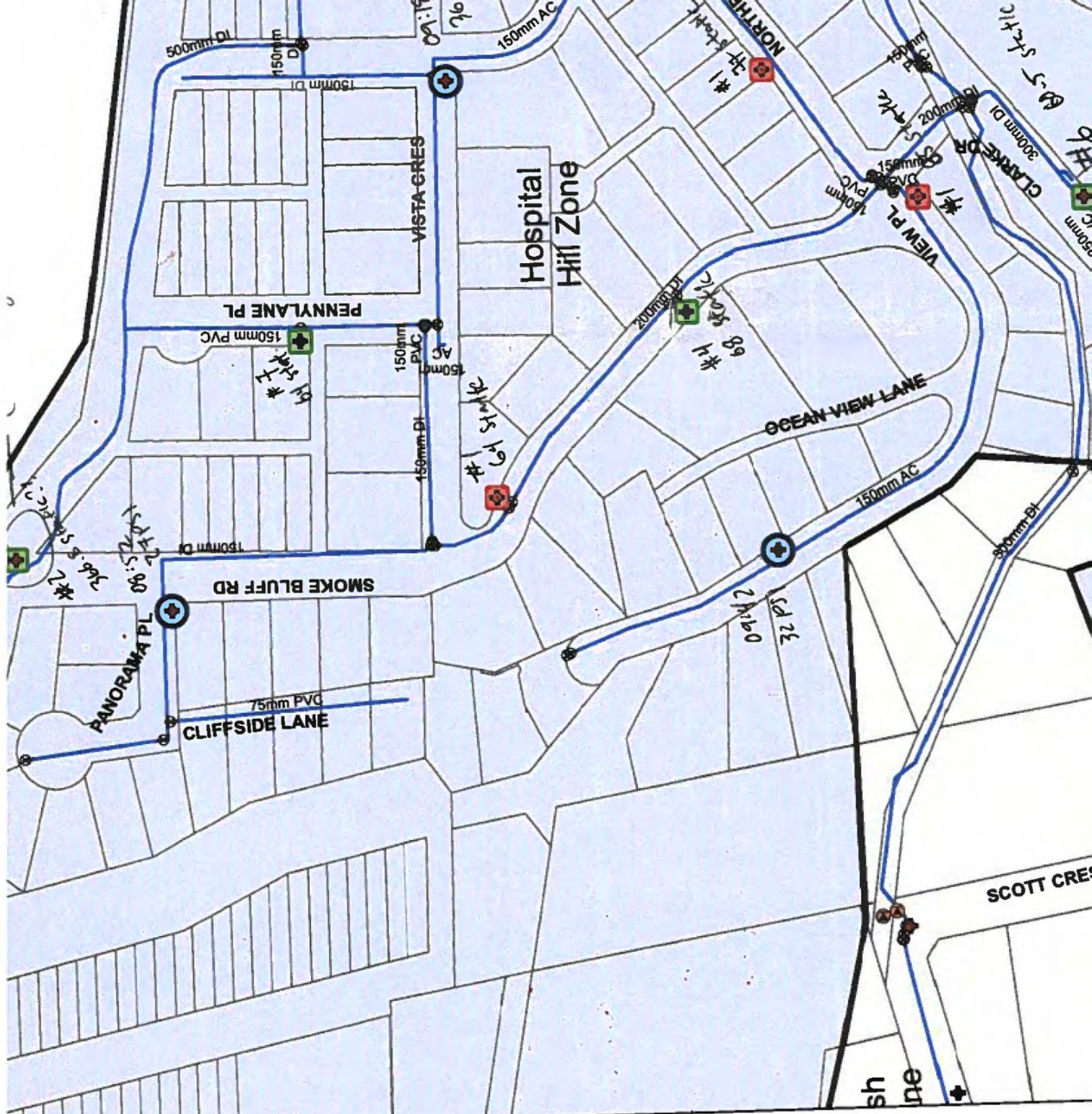
READ CRES

Ø150 AC

Squamish River Zone

Legend

-  Hydrant
-  Residual Hydrant
-  Flow Hydrant
-  PRVs
-  Normally Open Valve
-  Closed for Hydrant Test
-  Hydrant Valve
-  District Watermain



Legend

- Hydrant
- Flow Hydrants
- Static Hydrants
- Residual Hydrants
- PRVs
- Water Valves
- Water Mains
- Pressure Zone Boundaries
- Parcels



Legend

- Hydrant
- Flow Hydrants
- Static Hydrants
- Residual Hydrants
- PRVs
- Water Valves
- Water Mains
- Pressure Zone
- Boundaries



N WAY

QUEENS WAY
300mm DI
200mm DI

PRODUCTION WAY
200mm DI

MID WAY
200mm DI

INDUSTRIAL WAY
200mm DI

DISCOVERY WAY
200mm PVC

13:43
56 PSI









14:03
57 PSI

could get
rate of
flow

150mm
PVC 200mm DI
200mm



Legend

- Hydrant 
- Residual Hydrant 
- Flow Hydrant 
- PRVs 
- Normally Open Valve 
- Closed for Hydrant Test 
- Hydrant Valve 
- District Watermain 

Thunderbird Zone

GLACIER HEIGHTS PL

GLACIER HEIGHTS PLACE

GLACIER VIEW DR

GLACIER VIEW PL

Ø150 PVC

Ø150 PVC

Ø300 PVC

Ø300 PVC

Ø150 PVC

Ø300 PVC

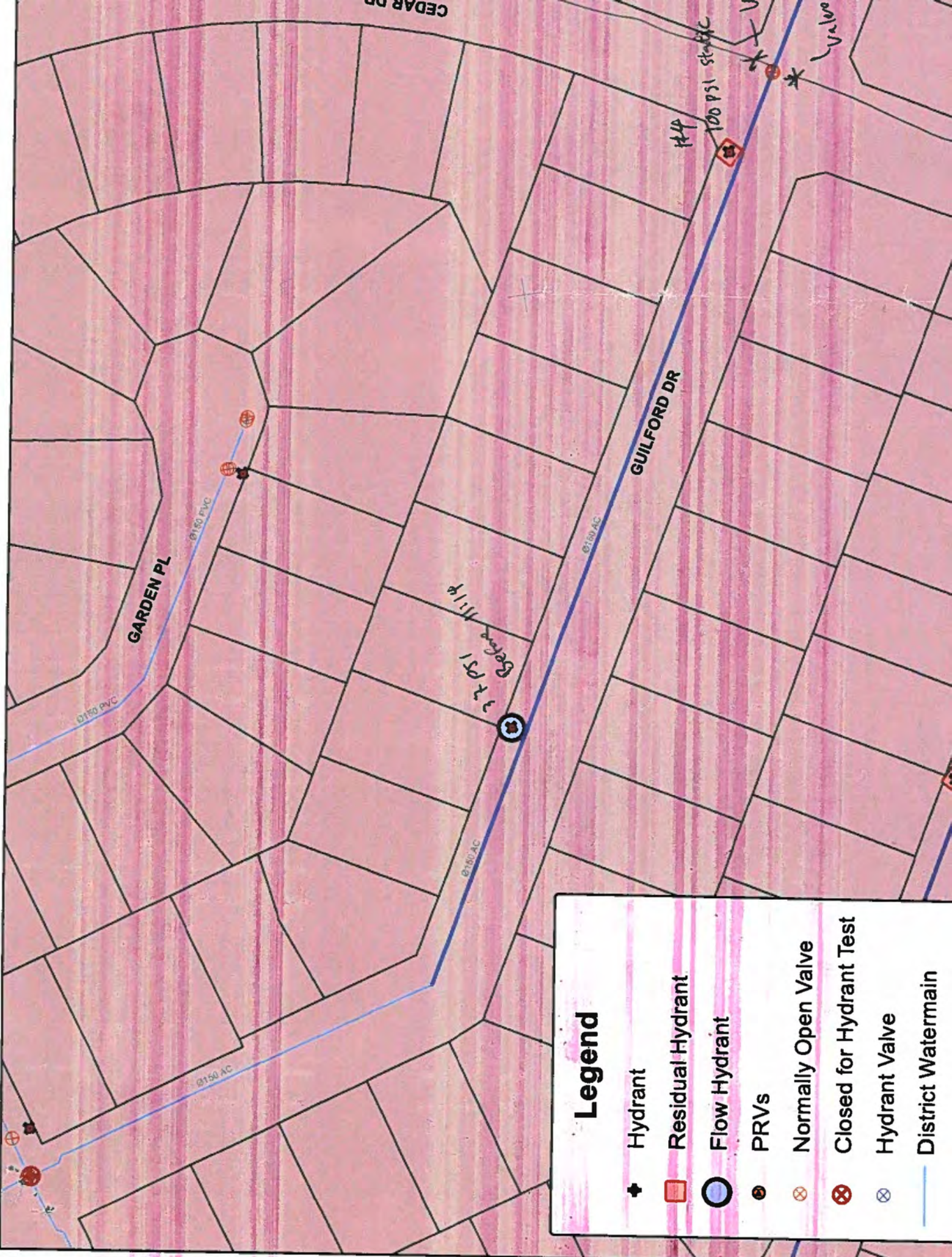
#4
120 static

15:35
76 PSI

Legend

- Hydrant
- Residual Hydrant
- Flow Hydrant
- PRVs
- Normally Open Valve
- Closed for Hydrant Test
- Hydrant Valve
- District Watermain

Garibaldi



Legend

- ⊕ Hydrant
- ⊞ Residual Hydrant
- ⊙ Flow Hydrant
- ⊙ PRVs
- ⊗ Normally Open Valve
- ⊗ Closed for Hydrant Test
- ⊗ Hydrant Valve
- District Watermain

UNSIGNE

Squam

14:49 EDGEWATER CRES

Ø150 PVC

Ø150 PVC

Ø150 PVC

Ø150 PVC

Ø150 PVC

* 1 Sp. 150 PSI

150 PSI

* 1 Sp. 150 PSI

Legend

- Hydrant
- Residual Hydrant
- Flow Hydrant
- PRVs
- Normally Open Valve
- Closed for Hydrant Test
- Hydrant Valve
- District Watermain





Legend

- ✚ Hydrant
- ◻ Residual Hydrant
- ◯ Flow Hydrant
- PRVs
- ⊗ Normally Open Valve
- ⊗ Closed for Hydrant Test
- ⊗ Hydrant Valve
- District Watermain

APPENDIX

F

CALIBRATION
RESULTS

TABLE F1 - C FACTOR
FIELD RESULTS VS. COMPUTER PREDICTED RESULTS

Date	Pressure Zone	Hydrant Test No. & Time	Flow (USGPM)	Flow (L/s)	Test ID	Model Scenario	WaterCAD Node	WaterCAD Label	GIS ID	Height (ft)	Field Result			Computer Result			Static Residual Diff (psi)	% Diff Static Pressure	Residual Diff (psi)	% Off Proposed Pressure	Design Based Conditions				
											Static (psi)	Residual (psi)	HGL Drop (ft)	Static (psi)	Residual (psi)	HGL (ft)						Static HGL (ft)	Residual HGL (ft)		
04-Oct-23	Squamish River	Start	1250	78.86		2023 ADD	8771	J-2680	364	3.0	58.0	77.0	64.4	56.6	7.7	89.1	68.0	65.3	50.4	1.1	1.2%	-9.0	-11.7%	1,105 x ADD	
		End				CF 1980-DI#1 Squamish River	11739	J-215	361	2.5	86.0	78.0	64.6	56.8	7.7	89.9	73.0	65.3	53.4	0.9	1.0%	-5.0	-6.4%		
		End				CF 1980-DI#1 Squamish River	9291	J-3054	362	2.0	86.0	78.0	64.6	56.8	7.7	89.9	73.0	65.3	53.4	0.9	1.0%	-5.0	-6.4%		
	Squamish River	Start	880	54.26		2023 ADD	11856	J-254	12	14.1	26.0	46.9	40.7	19.3	64.6	12.3	61.5	24.7	2.1	3.4%	-22.8	-25.0%	1,105 x ADD		
		End				CF 1970-AC#1 Squamish River	8693	J-2847	9	18.0	62.5	35.1	59.9	40.7	19.3	63.9	33.2	61.5	39.9	-1.5	-2.3%	-10.1	-12.3%		
		End				CF 1970-AC#1 Squamish River	9264	J-3050	10	16.5	64.4	43.3	62.5	46.9	15.5	63.9	33.2	61.5	39.9	-1.5	-2.3%	-10.1	-12.3%		
06-Oct-23	Alice Lake	Start	1373	86.59		2023 ADD	8651	J-2763	168	10.5	67.0	130.2	93.4	101.5	75.7	25.9	138.4	87.0	108.2	71.3	9.2	7.1%	-6.4	-8.9%	1,105 x ADD
		End				CF 1990-PVC#2 Alice Lake	7048	J-1869	167	10.0	130.2	107.4	103.6	85.3	16.3	138.7	106.4	108.2	64.8	6.3	4.7%	-1.0	-0.9%		
		End				CF 1990-PVC#2 Alice Lake	7068	J-1881	168	9.8	133.4	107.4	103.6	85.3	16.3	138.7	106.4	108.2	64.8	6.3	4.7%	-1.0	-0.9%		
	Squamish River	Start	1125	70.98		2023 ADD	8701	J-2851	414	4.2	45.0	68.0	64.1	51.4	12.7	82.1	70.9	62.8	54.9	-1.9	-2.3%	4.9	7.4%	1,105 x ADD	
		End				CF 1980-DI#2 Squamish River	7973	J-2509	418	5.0	84.0	66.0	64.1	51.4	12.7	82.1	70.9	62.8	54.9	-1.9	-2.3%	4.9	7.4%		
		End				CF 1980-DI#2 Squamish River	8484	J-1618	415	4.2	80.0	60.0	60.4	46.4	14.1	83.4	67.5	63.0	51.7	3.4	4.3%	7.5	12.5%		
11-Oct-23	Westway	Start	1025	64.87		2023 ADD	9193	J-3032	265	19.0	37.0	103.5	70.0	99.1	75.5	23.6	105.5	42.1	97.1	56.0	-3.0	-2.9%	-27.9	-39.8%	1,105 x ADD
		End				CF 1970-AC#2 Westway	11668	J-188	294	26.3	103.5	70.0	99.1	75.5	23.6	105.5	42.1	97.1	56.0	-3.0	-2.9%	-27.9	-39.8%		
		End				CF 1970-AC#2 Westway	7561	J-2273	264	22.8	101.0	59.5	93.8	64.6	29.2	105.5	12.6	31.7	31.7	4.5	4.5%	-46.9	-78.6%		
	Squamish River	Start	880	54.26		2023 ADD	8716	J-2659	383	7.9	26.0	79.0	43.0	62.5	37.2	25.3	77.5	45.2	61.6	38.8	-1.5	-1.9%	2.2	5.1%	1,105 x ADD
		End				CF 1990-PVC#3 Squamish River	6792	J-1813	382	7.0	79.0	43.0	62.5	37.2	25.3	77.5	45.2	61.6	38.8	-1.5	-1.9%	2.2	5.1%		
		End				CF 1990-PVC#3 Squamish River	9320	J-3065	381	7.7	75.0	48.0	60.4	41.4	19.0	76.5	55.8	61.6	47.0	1.5	2.0%	7.8	16.3%		
Thunderbird	Start	1465	92.43		2023 ADD	8893	J-2641	245	135.6	78.0	238.7	194.7	194.7	45.0	146.3	47.8	240.0	170.7	0.3	0.2%	-34.2	-41.7%	1,105 x ADD		
	End				CF 1990-PVC#1 Thunderbird	7326	J-2136	246	137.0	146.0	82.0	238.7	194.7	45.0	146.3	47.8	240.0	170.7	0.3	0.2%	-34.2	-41.7%			
	End				CF 1990-PVC#1 Thunderbird	8752	J-2873	255	146.6	123.0	72.0	233.1	197.2	35.9	132.6	45.3	240.0	178.5	9.6	7.8%	-26.7	-37.1%			
	Westway	Start	880	54.26		2023 ADD	7555	J-2270	283	22.2	26.0	113.0	74.0	97.4	70.0	27.4	111.3	58.7	97.1	59.3	-1.7	-1.5%	-15.3	-20.7%	1,105 x ADD
		End				CF 1970-AC#3 Westway	7226	J-2077	281	18.0	113.0	74.0	97.4	70.0	27.4	111.3	58.7	97.1	59.3	-1.7	-1.5%	-15.3	-20.7%		
		End				CF 1970-AC#3 Westway	9389	J-3087	282	19.3	105.5	72.0	93.5	69.9	23.6	109.4	38.5	97.1	46.4	3.9	3.7%	-33.5	-46.5%		

TABLE F2 - MULTI PRESSURE
FIELD RESULTS VS. COMPUTER PREDICTED RESULTS

Date	Flow set no.	Pressure Zone	Hydrant Test No. & Time	Flow (USGPM)	Flow (L/s)	Test ID	WaterCAD Nodes	GIS ID	Hydrant Elev. (ft)	Static Elev. (ft)	Residual (psi)	Static HGL (ft)	Residual (ft)	Pressure Drop (psi)	Computer Result Residual (psi)	Static HGL (ft)	Residual (ft)	Static Pressure Diff. (psi)	% diff Static Pressure	Residual Pressure Diff. (psi)	% diff Residual Pressure	Boundary Conditions	
4-Oct-23	MP #5	Squamish River	Start	1205	76.02	MP #5-DK01	8259	404	1.6	88.1	84.7	63.9	61.6	3.4	89.6	65.1	65.1	1.5	1.7%	-0.3	-0.4%	1.105 x ADD	
			MP #5-DK01	8473	500	20	88.1	84.7	63.9	61.6	3.4	89.6	65.1	65.1	1.5	1.7%	-0.3	-0.4%					
			MP #5-DK02	11151	407	10	89.4	76.9	63.9	55.1	12.5	91.0	75.4	65.1	5.4	1.6	1.8%	-1.5	-2.0%				
			MP #5-DK04	7352	563	1.0	87.6	83.3	62.6	59.6	4.3	91.0	85.4	65.1	67.2	3.4	3.9%	2.1	2.9%				
			MP #5-DK02	6598	499	1.1	88.4	85.2	64.9	61.9	4.2	89.6	63.5	65.1	60.8	0.2	0.2%	-1.7	-2.0%				
			MP #5-DK01	8473	500	2.0	87.4	82.6	62.5	59.1	4.8	91.0	80.0	65.1	57.4	3.6	4.1%	-2.6	-3.1%				
			MP #5-DK04	7302	583	1.0	87.4	82.6	62.5	59.1	4.8	91.0	80.0	65.1	57.4	3.6	4.1%	-2.6	-3.1%				
			MP #5-DK03	7285	582	1.2	89.0	84.5	64.6	61.4	4.5	89.6	63.5	65.1	60.8	0.6	0.7%	-1.0	-1.2%				
			MP #5-DK02	12596	495	1.0	89.0	85.0	63.6	60.8	4.0	91.0	84.8	65.1	58.2	2.0	2.2%	-0.2	-0.2%				
			MP #5-DK04	7302	583	1.0	87.0	82.5	62.2	59.0	4.5	91.0	81.2	65.1	58.2	4.0	4.6%	-1.3	-1.6%				
			MP #5-DK04	7462	494	1.6	89.5	85.0	64.9	61.8	4.5	89.6	63.5	65.1	60.8	0.1	0.1%	-1.9	-2.2%				
			MP #5-DK01	8473	500	2.0	90.0	86.0	65.3	62.5	4.0	89.6	63.5	65.1	60.8	-0.4	-0.4%	-2.7	-3.1%				
	MP #5-DK02	9097	506	2.0	88.0	84.0	62.9	60.1	4.0	91.0	84.6	65.1	60.6	3.0	3.4%	0.6	0.7%						
	MP #5-DK04	7302	583	1.0	88.0	84.0	62.9	60.1	4.0	91.0	84.6	65.1	60.6	3.0	3.4%	0.6	0.7%						
	MP #5-DK01	7555	283	22.2	106.0	83.0	97.3	81.2	23.0	105.5	80.6	97.1	79.6	-0.5	-0.5%	-2.4	-2.9%						
	MP #5-DK01	7561	284	22.8	106.0	84.0	97.5	82.1	22.0	105.2	80.6	97.1	81.3	-0.8	-0.8%	-1.2	-1.4%						
	MP #5-DK02	6706	288	23.0	110.0	77.0	96.6	73.4	33.0	110.4	76.3	97.1	73.1	0.4	0.4%	-0.7	-0.9%						
	MP #5-DK04	8389	282	19.3	110.0	77.0	96.6	73.4	33.0	110.4	76.3	97.1	73.1	0.4	0.4%	-0.7	-0.9%						
	MP #5-DK02	7120	287	20.9	104.0	80.0	95.9	79.0	24.0	105.5	79.1	97.1	76.5	1.5	1.4%	-0.9	-1.1%						
	MP #5-DK01	7561	284	22.8	104.0	80.0	96.1	79.2	24.0	105.2	78.7	97.1	76.5	1.2	1.2%	-1.3	-1.6%						
	MP #5-DK02	6706	288	23.0	106.0	80.0	96.2	76.5	29.0	109.0	79.7	97.1	76.5	1.0	0.9%	-0.3	-0.4%						
	MP #5-DK04	11650	298	20.3	106.0	80.0	96.2	76.5	29.0	109.0	79.7	97.1	76.5	1.0	0.9%	-0.3	-0.4%						
	MP #5-DK01	6852	279	18.8	104.0	78.0	95.9	77.6	26.0	105.5	82.8	97.1	81.2	1.5	1.4%	4.8	6.2%						
	MP #5-DK01	7561	284	22.8	104.0	77.6	96.1	77.6	26.4	105.2	82.9	97.1	81.4	1.2	1.2%	5.3	6.8%						
MP #5-DK02	6706	288	23.0	104.0	77.6	96.1	77.6	26.4	105.2	82.9	97.1	81.4	1.2	1.2%	5.3	6.8%							
MP #5-DK04	9193	285	19.0	105.5	79.5	95.3	74.9	29.0	110.5	86.2	97.1	79.7	2.4	2.2%	6.7	8.4%							
MP #1	880	61.63	6933	175	10.5	MP #1-DK01	6871	176	10.0	86.5	86.5	70.8	51.1	28.0	86.5	63.1	70.3	53.7	-1.0	-1.2%	3.6	6.2%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK01	6871	176	10.0	87.2	73.5	71.3	61.7	13.7	86.5	66.3	70.3	56.9	-1.7	-1.8%	-7.0	-8.5%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK01	6871	176	10.0	84.1	56.2	69.9	49.0	20.9	86.3	63.9	70.3	55.2	1.2	1.4%	8.7	10.8%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK06	11948	624	9.7	88.5	75.1	71.9	62.5	13.4	88.0	72.5	70.3	60.7	-2.5	-2.8%	-2.6	-3.5%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK07	11951	646	9.1	89.2	71.3	71.8	59.2	17.9	88.5	71.2	70.3	59.3	-2.4	-2.7%	-0.1	-0.1%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK02	6463	177	10.0	86.1	63.0	70.5	54.3	23.1	86.5	64.3	70.3	55.3	-0.6	-0.7%	6.0	2.1%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK01	6871	176	10.0	86.4	72.6	70.7	61.0	13.8	86.5	66.6	70.3	56.9	-0.9	-1.0%	-6.0	-8.3%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK02	6890	181	10.0	84.7	63.3	69.6	54.5	21.4	86.5	64.3	70.3	55.5	0.8	0.9%	1.2	1.9%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK06	11948	624	9.7	87.3	72.9	71.1	61.0	14.4	86.0	70.0	70.3	59.0	-1.3	-1.5%	-2.9	-4.0%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK07	11951	646	9.1	88.7	70.7	71.5	58.8	18.0	88.8	66.5	70.3	55.9	-1.9	-2.1%	-4.2	-5.9%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK03	6502	178	9.4	87.1	87.6	71.2	57.5	19.5	86.5	68.0	70.3	55.8	-1.6	-1.8%	-2.6	-3.8%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK01	6871	176	10.0	85.9	74.0	70.4	62.0	11.9	86.5	67.0	70.3	57.2	-0.4	-0.5%	-7.0	-8.5%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK02	8090	181	10.0	86.9	64.8	70.4	54.9	22.1	86.5	59.5	70.3	51.2	-0.4	-0.5%	-5.3	-6.2%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK06	11948	624	9.7	88.3	74.1	71.8	61.8	14.2	86.0	70.0	70.3	59.0	-2.3	-2.6%	-4.1	-5.5%	
MP #1	880	61.63	6933	176	10.0	MP #1-DK07	11951	646	9.1	89.0	71.0	71.7	59.0	18.0	88.8	66.1	70.3	55.7	-2.2	-2.5%	-4.9	-6.9%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK01	7537	538	90.3	120.0	78.6	55.0	175.3	158.7	23.6	78.2	53.7	175.1	157.8	-0.4	-0.5%	-1.3	-2.4%
MP #1	880	61.63	6933	176	10.0	MP #2-DK02	7438	39	120.0	103.5	65.0	172.6	145.5	38.5	106.9	59.7	175.1	147.8	3.4	3.3%	-5.3	-6.2%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK02	6749	537	99.8	100.6	62.6	172.4	145.7	38.0	104.2	58.8	175.1	141.7	3.6	3.6%	-5.8	-6.9%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK04	6312	539	101.7	96.9	88.1	173.3	146.0	38.8	99.2	59.2	175.1	142.3	2.3	2.4%	-5.4	-6.3%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK06	7095	539	105.2	105.7	67.2	176.4	148.3	38.5	103.6	57.6	175.1	142.7	-2.1	-2.0%	-9.6	-14.3%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK07	11918	242	102.1	106.9	79.4	67.3	175.8	149.3	22.1	78.2	55.6	175.1	149.2	-1.2	-1.5%	-1.7	-3.0%
MP #1	880	61.63	6933	176	10.0	MP #2-DK01	7438	39	120.0	79.4	67.3	175.8	149.3	22.1	78.2	55.6	175.1	149.2	-1.2	-1.5%	-1.7	-3.0%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK02	7254	240	106.3	96.1	80.1	173.9	148.6	36.0	99.7	56.6	175.1	148.4	1.6	1.7%	-4.5	-5.6%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK04	6312	539	101.7	101.0	86.1	172.7	148.2	34.9	104.2	62.7	175.1	145.9	3.2	3.2%	-3.4	-4.1%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK06	7095	539	105.2	96.8	91.0	173.3	146.1	35.8	99.2	57.1	175.1	145.4	2.4	2.5%	-3.9	-4.6%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK07	11918	242	102.1	105.0	101.3	175.9	152.2	33.7	103.6	62.9	175.1	148.4	-1.4	-1.3%	-8.4	-11.8%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK01	7438	39	120.0	78.9	64.5	175.5	158.3	24.4	78.2	53.9	175.1	158.0	-0.7	-0.9%	-0.6	-1.1%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK04	6312	539	101.7	99.3	63.2	171.5	146.1	36.1	104.2	58.4	175.1	142.9	4.9	4.9%	-4.8	-7.6%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK06	7095	539	105.2	96.9	89.5	173.3	146.3	36.4	99.2	56.6	175.1	143.0	2.3	2.4%	-4.9	-8.4%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK07	11918	242	102.1	105.0	66.5	175.9	148.9	38.5	103.6	57.8	175.1	142.8	-1.4	-1.3%	-8.7	-13.1%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK01	7438	39	120.0	79.4	64.5	175.8	158.5	24.7	78.2	54.8	175.1	158.6	-1.2	-1.5%	0.1	0.2%	
MP #1	880	61.63	6933	176	10.0	MP #2-DK04	6312	5															

