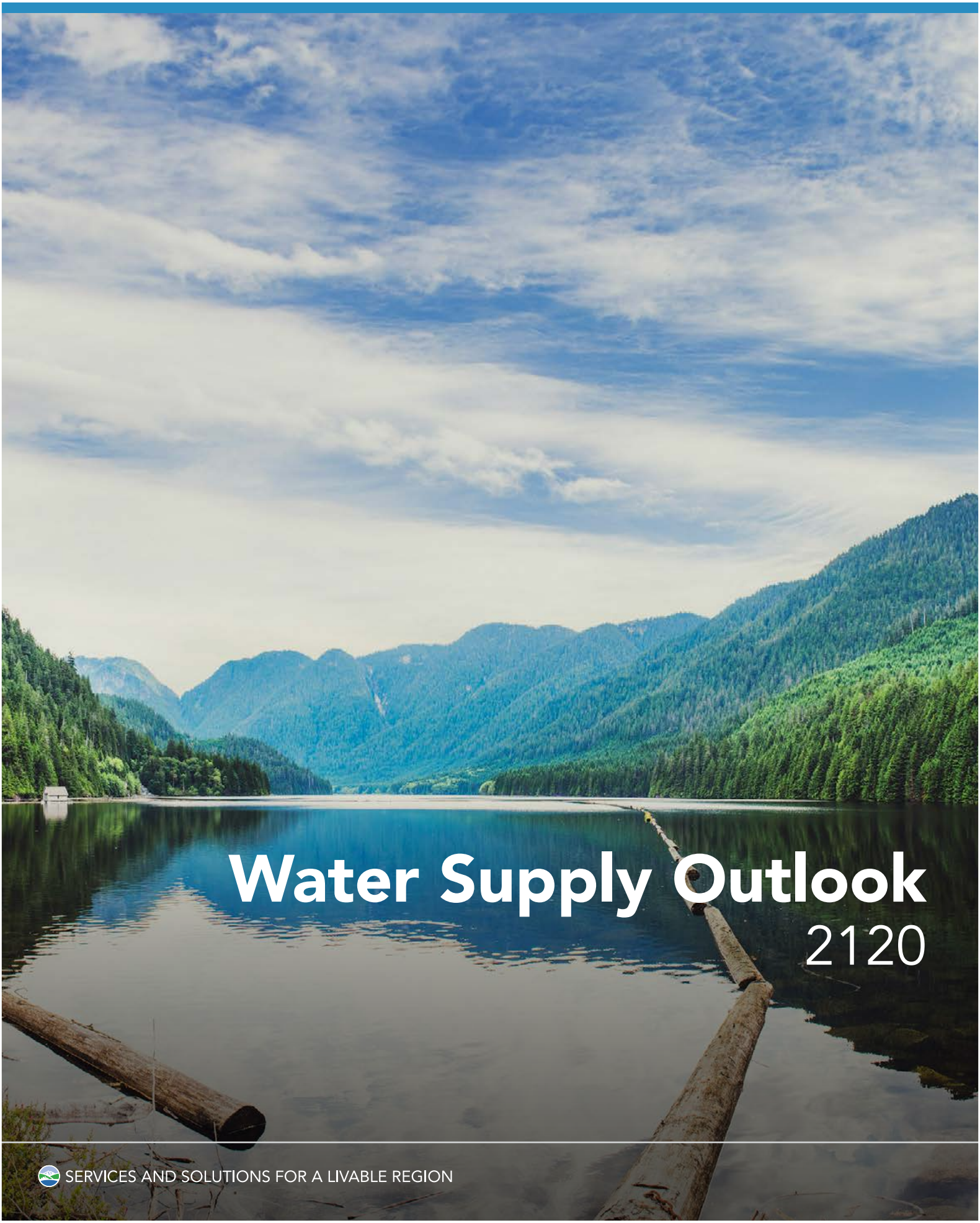


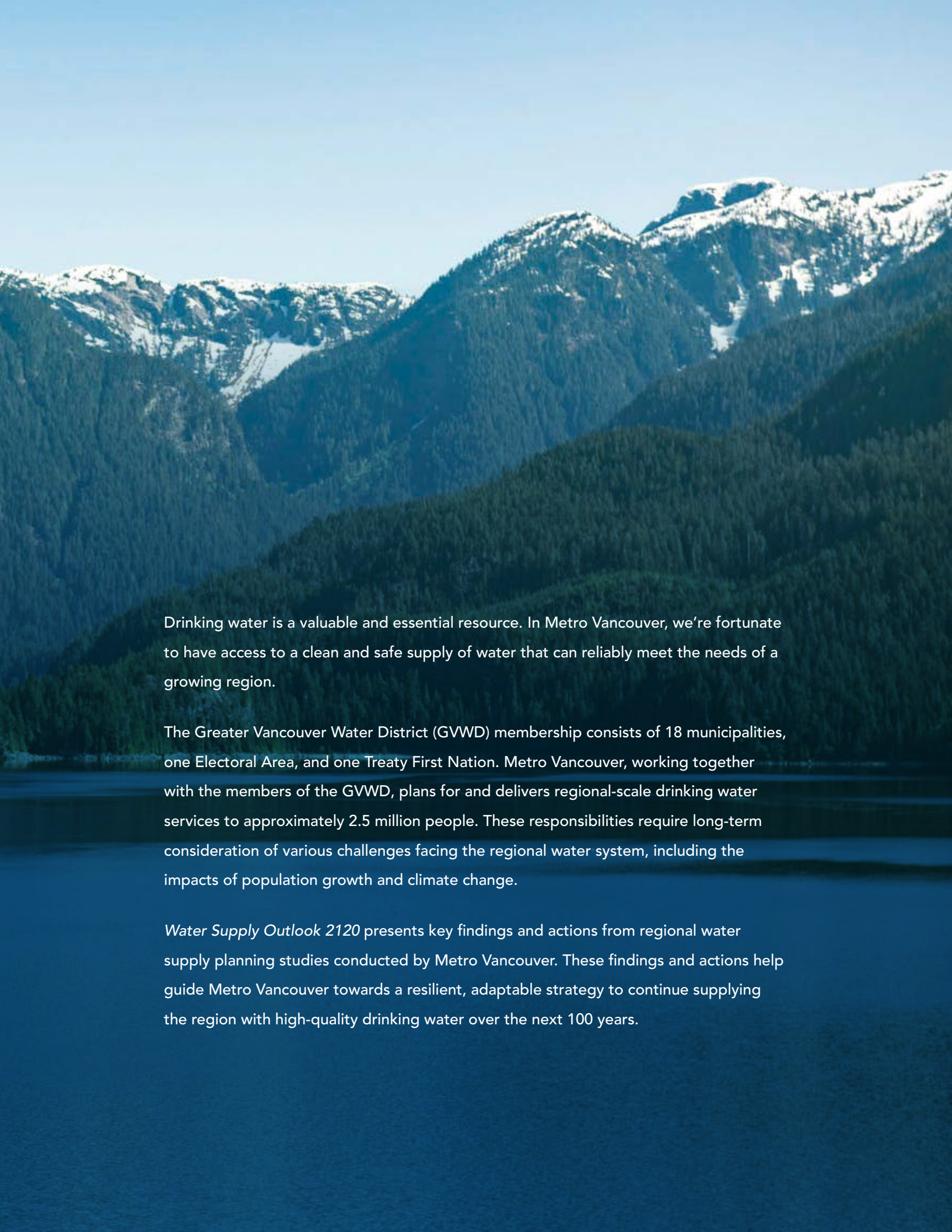
Water Supply Outlook 2120

4730 Kingsway, Burnaby, BC, V5H 0C6
metrovancouver.org

September 2019

Cover Photo: Seymour Reservoir

Contents



Drinking water is a valuable and essential resource. In Metro Vancouver, we're fortunate to have access to a clean and safe supply of water that can reliably meet the needs of a growing region.

The Greater Vancouver Water District (GVWD) membership consists of 18 municipalities, one Electoral Area, and one Treaty First Nation. Metro Vancouver, working together with the members of the GVWD, plans for and delivers regional-scale drinking water services to approximately 2.5 million people. These responsibilities require long-term consideration of various challenges facing the regional water system, including the impacts of population growth and climate change.

Water Supply Outlook 2120 presents key findings and actions from regional water supply planning studies conducted by Metro Vancouver. These findings and actions help guide Metro Vancouver towards a resilient, adaptable strategy to continue supplying the region with high-quality drinking water over the next 100 years.

Purpose

The regional water system has evolved significantly over the past decade. Metro Vancouver has completed major water supply and treatment projects, including the Seymour Capilano Filtration Project, while the region's population has grown significantly. Furthermore, many uncertainties that Metro Vancouver is now facing were not as well understood in the past as they are today, including the impacts of climate change, earthquakes, and other natural hazards.

Metro Vancouver has used the most current information available to assess the water system's resiliency to potential hazards and identify actions necessary for the continued supply and delivery of water to meet the region's needs over the next 100 years.

PURPOSE OF *WATER SUPPLY OUTLOOK 2120*

- To ensure that the regional water system is resilient to risks and challenges including a rapidly growing population, changing climate, seismic events, and power outages.
- To help guide the regional water system for the next 100 years and to ensure continued, reliable and sustainable delivery of high-quality drinking water.

ACTION

Metro Vancouver will integrate key actions into the *Drinking Water Management Plan*.

Water Supply Outlook 2120 aligns with direction provided by the Metro Vancouver Board and GVWD through the following key strategic plans:

- The *Board Strategic Plan* identifies the Board's key priorities, including direction for regional water services.
- Metro Vancouver's *Drinking Water Management Plan* sets the direction for drinking water initiatives in the region.
- The Metro Vancouver *2040 Regional Growth Strategy* supports the development of a compact urban area. Higher densities typically place less demand on regional water infrastructure.

Metro Vancouver intends to update *Water Supply Outlook 2120* every ten years, with the option for amendments along the way. This adaptive strategy will assess whether water demand and supply trends have proceeded as expected and will enable appropriate changes as required.

Regional collaboration

The feasibility of water supply expansion options, or combination of options, presented in this document will continue to be reassessed as new information becomes available incorporating the latest trends in population growth, climate change, and water demand. In order to develop any of these options into the region's next water supply source, Metro Vancouver will be engaging with and drawing upon the knowledge and experience of its member local governments, of First Nations, of other orders of government, and the public.

All of Metro Vancouver's existing water supply sources, and potential future options for supply expansion, are located in areas of historical and cultural significance to First Nations. Metro Vancouver is committed to engaging with First Nations and learning from their traditional knowledge and wisdom. This engagement will inform Metro Vancouver as it assesses the feasibility of these options as the next source of water supply to the region.

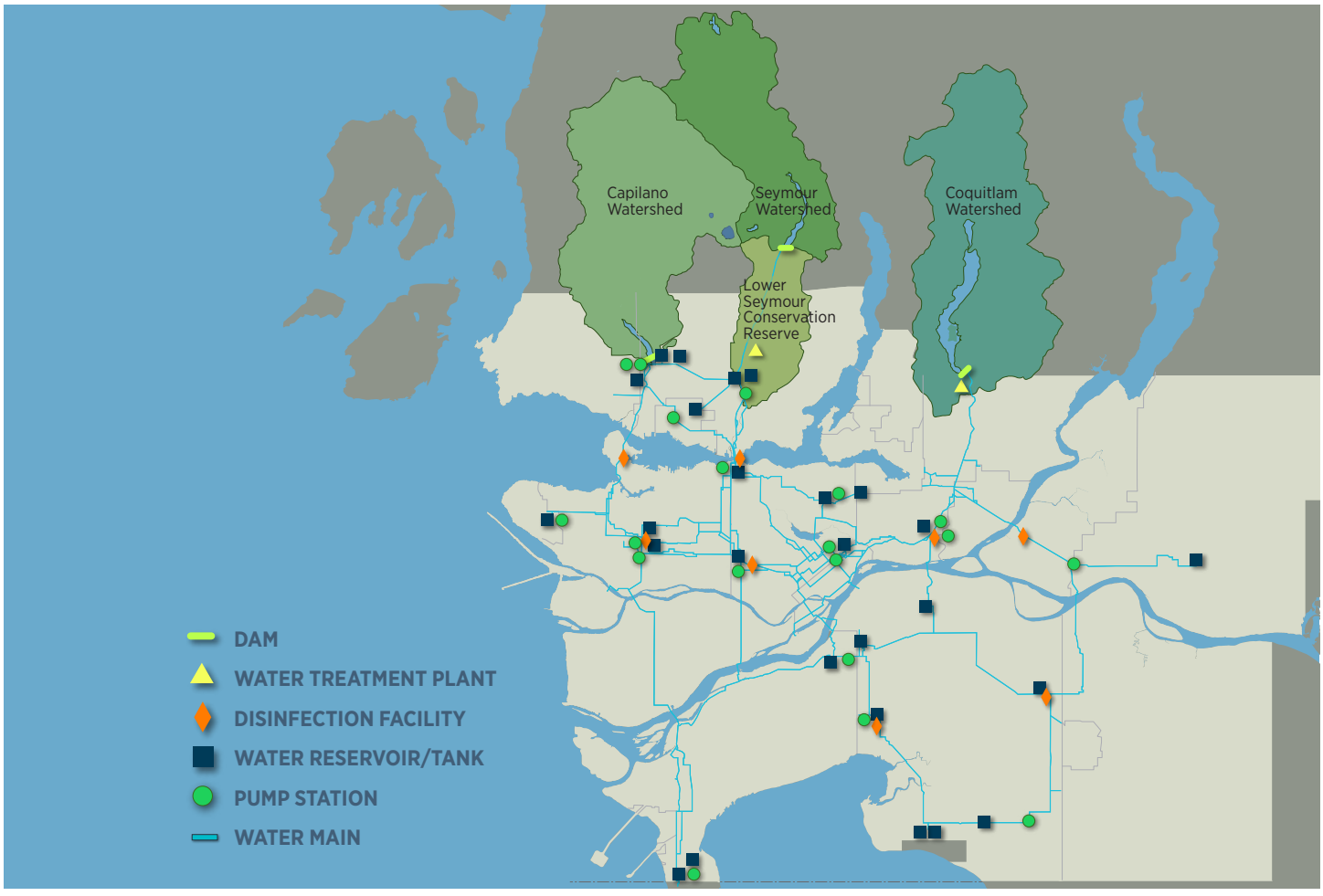
Cleveland Dam.

Metro Vancouver's water system

Metro Vancouver's water comes from rainfall and snowmelt in three major watersheds: Capilano, Seymour, and Coquitlam. These protected watersheds comprise about 60,000 hectares and are closed to public access to safeguard the high-quality source water.

The water supply is stored in three main source storage reservoirs and three supplemental alpine reservoirs. Metro Vancouver benefits from having existing supply sources which reliably refill, are in close proximity to the rapidly growing region that they service, and are situated at high elevations that allow for the delivery of water largely by gravity, reducing the need for energy-intensive pumping.

The regional water system also includes five dams, two water treatment plants, 26 in-system storage reservoirs and tanks, 19 pump stations, eight disinfection facilities, and over 520 kilometres of transmission water mains. This does not include local government infrastructure, which distributes water from the regional system to residents and businesses.



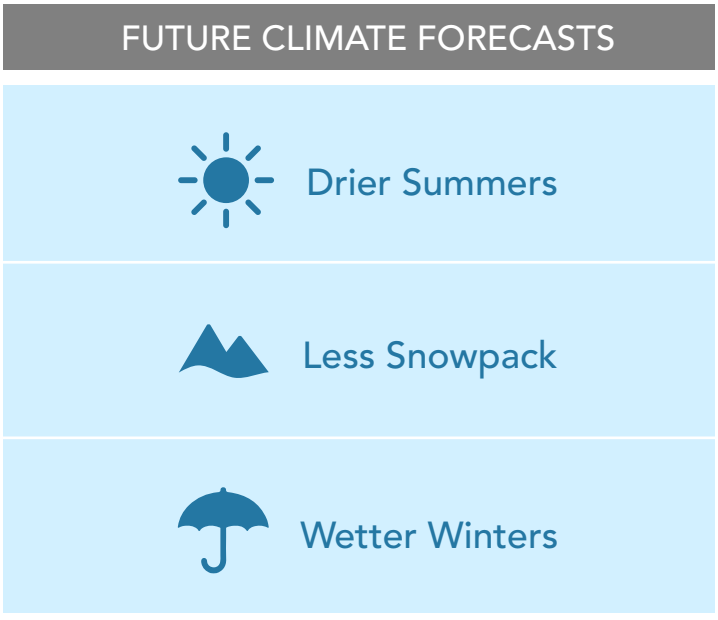
Metro Vancouver's regional water system.

Impacts of climate change on water supply

Metro Vancouver has published regional climate scenarios which indicate that temperatures in Metro Vancouver are expected to warm. The regional effects of climate change must be considered when planning for future water supply and use.

Warmer temperatures will cause more precipitation to fall as rain rather than as snow in the watersheds during winter months. The warmer temperatures and winter rains will erode the winter snowpack more quickly and reduce its depth and availability for drinking water in the spring and summer months.

Precipitation forecasts indicate drier summers that could extend later into the year. Hotter days and longer dry spells over the summer months, combined with reductions in snowpack, could put strain on the existing water supply during times of the year when temperatures are high and water is in greatest demand.



While climate modelling does not forecast immediate risks to the water supply or key infrastructure, the study confirmed future supply storage vulnerabilities due to changes in snowpack and seasonal inflow. Metro Vancouver will address these vulnerabilities over time with planned increases in supply and storage capacity.

The region will likely need additional source storage by the mid-2030s based on forecasted demand growth, which Metro Vancouver is planning to achieve by constructing a second intake in the Coquitlam Reservoir that can access increased storage volumes to deeper depths. Implementation of this project is currently underway. With the Coquitlam Intake No. 2 project in place, no water shortages are projected until 2070.

ACTION

Metro Vancouver will refine *Water Supply Outlook 2120* as additional detail and information about climate change trends and impacts become available.

KEY FINDING

Metro Vancouver's water system is highly resilient to future climate change with flexibility for adaptive responses. The water storage reservoirs are expected to continue to reliably refill every fall and winter, but expansion of the water supply will be required to meet the needs of a growing population and respond to the impacts of a changing climate.

Measuring snowpack in the Seymour Watershed. Snowpack depth is projected to decrease as a result of climate change.

Planning for a growing population

Metro Vancouver is a desirable region, benefitting from an attractive natural environment, diverse and livable communities, and a strong economy. These features have led to significant population growth, which is not expected to slow down over the next several decades. The region's population is projected to increase by over 35,000 residents per year, from 2.5 million to a population of 3.6 million by 2050.

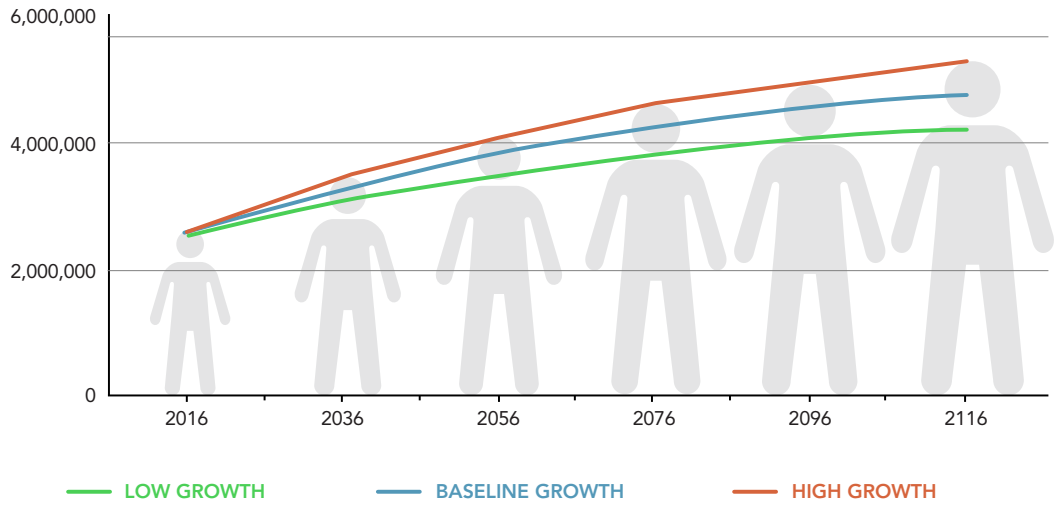
To accommodate our growing population, the region is focusing new housing in complete, compact communities. Increasingly, new housing units will take the form of apartments and other multi-family dwellings. A greater share of multi-family housing in the region has the potential to reduce some of the impact of population growth on water demands.

Metro Vancouver considers projections for population growth and housing types in drinking water demand forecasts.

KEY FINDING

Compact development patterns typically use infrastructure more efficiently and place less demand on the overall water system. However, high population growth rates are projected to increase overall demand for drinking water.

REGIONAL POPULATION PROJECTIONS



Preparing for earthquakes and other natural hazards

Natural hazard risks facing Metro Vancouver include severe weather events, flooding, and earthquakes. It is critical that the water system reliably meets essential service demands both during and after these types of events.

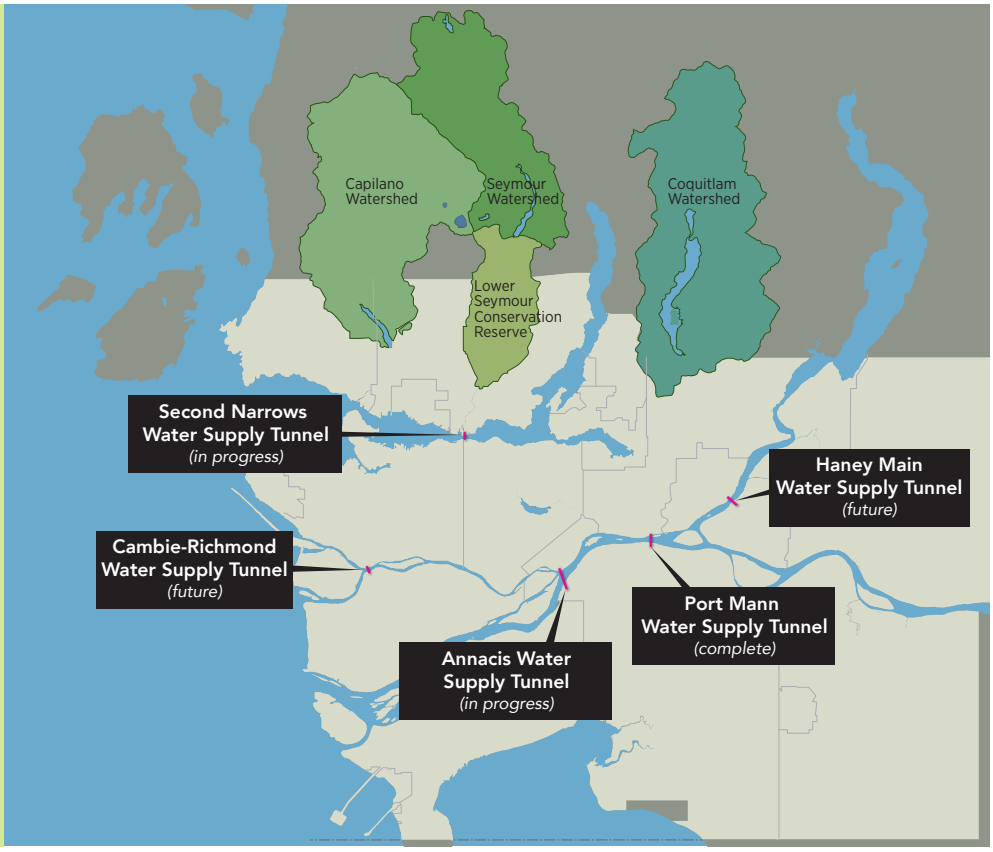
Metro Vancouver has completed extensive work over the past decade to upgrade and improve the regional water system's ability to withstand earthquakes.

Metro Vancouver has seismically upgraded approximately 75% of existing in-system reservoirs and pump stations. Its major water treatment facilities have been designed and constructed to current seismic standards. The Seymour Falls Dam meets current seismic design criteria and does not require additional evaluation at this time. An updated assessment of the Cleveland Dam, which was seismically upgraded in 1992, is also underway. BC Hydro seismically upgraded the Coquitlam Dam in 2008.

Marine crossings are difficult to repair quickly after an earthquake; therefore, major marine crossings should be resilient to support rapid post-disaster recovery.

ACTION

Metro Vancouver has completed the Port Mann Water Supply Tunnel and is in the process of upgrading four other critical marine crossings under Burrard Inlet and the Fraser River to help ensure reliable water supply following a major earthquake.



Severe weather events and flooding, intensified and made more frequent by climate change, have the potential to disrupt the power supply to water system infrastructure. Metro Vancouver is less vulnerable to power outages than many other water utilities, partially due to its largely gravity-fed supply, which reduces reliance on reliable power. However, as the population continues to grow and increased demand requires more pumping of water around the region, Metro Vancouver's water system will become more dependent on reliable power.

ACTION

Some of Metro Vancouver's pump stations and other facilities are not equipped with the back-up power supply that is needed to ensure resiliency and continued operation during power outages. Phased implementation is underway on critical infrastructure, on a prioritized basis.

Barnston-Maple Ridge Pump Station.

How we use water

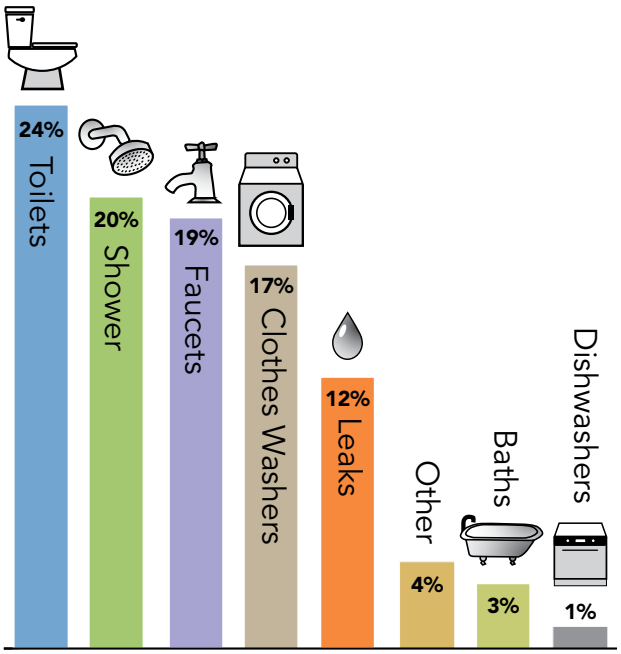
Metro Vancouver's drinking water is used throughout the region for households, industrial and commercial purposes, irrigation of parks and public spaces, fire protection, and other uses. On a typical day, the region uses about 1 billion litres of water.

Most of the water used in the region (about 60%) is for residential purposes. Non-residential use accounts for the remaining 40%.

Indoor residential use includes toilet flushing, showers and baths, clothes washing, dishwashing, cooking, and drinking. For non-residential users, water use also includes industrial processing, food processing, and cooling of buildings.

Outdoor water use in Metro Vancouver consists mainly of landscape irrigation for households, commercial properties, golf courses, and public parks. Most of this outdoor use occurs during the summer and early fall, when overall daily water use can increase by 50% or more.

MAJOR USES OF WATER INSIDE HOMES



From *Residential End Use of Water*, Version 2. Water Research Foundation. 2016.

Water-efficient appliances help lower household demand for drinking water.

ACTION

Metro Vancouver is further investigating the potential for expanded water reuse (e.g., rainwater harvesting and greywater).

Water conservation

Water conservation is a major part of Metro Vancouver's planning to ensure the sustainable use of water resources. Helping residents, businesses, schools, and local governments use only what they need contributes to an efficient and cost-effective water system.

While we live in a rainy region, most precipitation in Metro Vancouver occurs between November and April. Water use increases during dry summer months, particularly outdoors. Sustainable water use habits, as well as efficient household fixtures and appliances, help significantly to lower demand and sustain reservoir levels during dry months. The potential impacts of population growth and climate change on the water supply and transmission system also highlight the importance of using less water.

Metro Vancouver encourages water conservation through behaviour change campaigns, educational programming, and policies it develops with local governments and other stakeholders. The watering restrictions in Metro Vancouver's *Drinking Water Conservation Plan* help manage the use of water during periods of high demand, mostly by limiting lawn watering during late spring to early fall.

The region's lawn watering regulations significantly reduce water use during drier months.

KEY FINDING

Greater implementation of conservation programs can reduce demands on Metro Vancouver's water system, potentially deferring the need for long-term future regional capital supply projects.

Water metering initiatives in Metro Vancouver and other areas have had significant positive impacts on water conservation efforts. Generally, all businesses in Metro Vancouver are fully metered. The approach to metering single-family and multi-family homes by local governments varies across the region. Metro Vancouver supports water metering as a best management practice, and encourages local governments to move towards universal metering.

ACTION

Metro Vancouver is continuing water conservation education and behaviour change efforts.

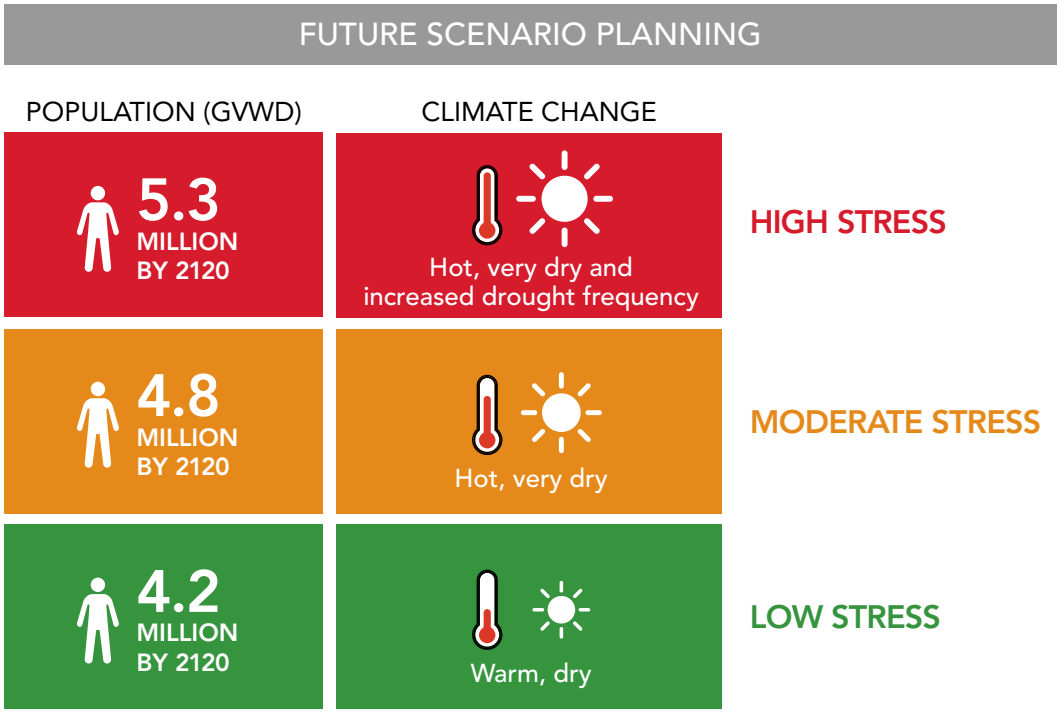
Long-term water scenario planning

Given the 100-year outlook of the water supply planning study, there are many possible future demand and supply outcomes. While any outcome may occur during the entirety of a long-term forecast, it is not reasonable to plan water supplies for extremely rare conditions, as this carries a high risk of costly over or under-building of major capital infrastructure.

Metro Vancouver has developed three planning scenarios for probable low, moderate, and high-stress outcomes, after identifying the most important factors influencing the region's water demands and supplies over the next 100 years.

Factors include:

- population growth and density;
- climate change;
- unplanned demand shifts (e.g., a shift from local non-potable water supplies for agricultural use to Metro Vancouver's water);
- conservation and efficiency progress (e.g., increases in plumbing efficiency or residential metering);
- metering with associated water pricing; and
- summer demand management (e.g., tightening of watering regulations).



Water demand planning

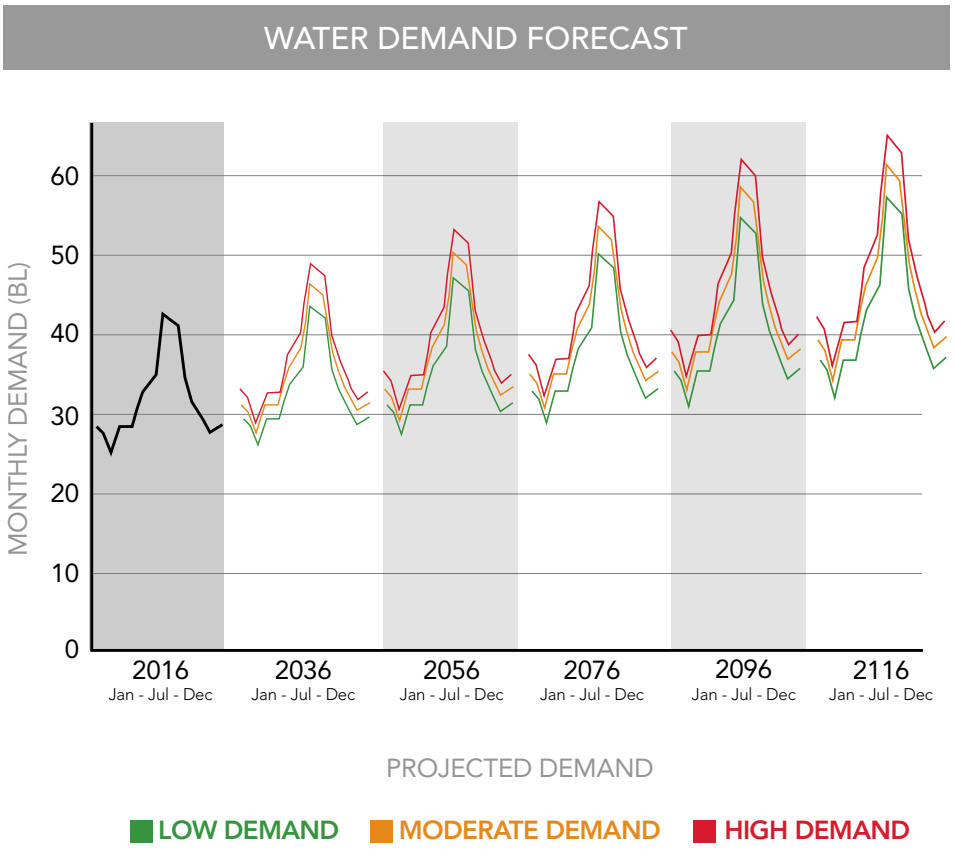
Even with regional population growth of more than 35,000 people annually, per capita water use has been steadily declining in Metro Vancouver. These declines are likely related to the implementation of summer watering regulations and other water conservation and efficiency measures (e.g., plumbing codes and fixtures). Despite this per capita decrease, total water demand is anticipated to rise over the coming years as the population continues to increase and the downward trend in per capita use slows.

Metro Vancouver has developed long-range forecasts to plan for future water demand, accounting for the major drivers and variables that influence water use over time, including population growth and housing types, climate change, and types of industry.

Total annual Metro Vancouver water demand in both 2017 and 2018 was about 390 billion litres, averaging 1.07 billion litres per day. Forecasts indicate that total annual water demand will rise to around 500 to 600 billion litres in the next 100 years, depending on the possible future scenario. Monthly demand is also expected to increase, especially during the dry summer months, as seen in the graph for all scenarios.

KEY FINDING

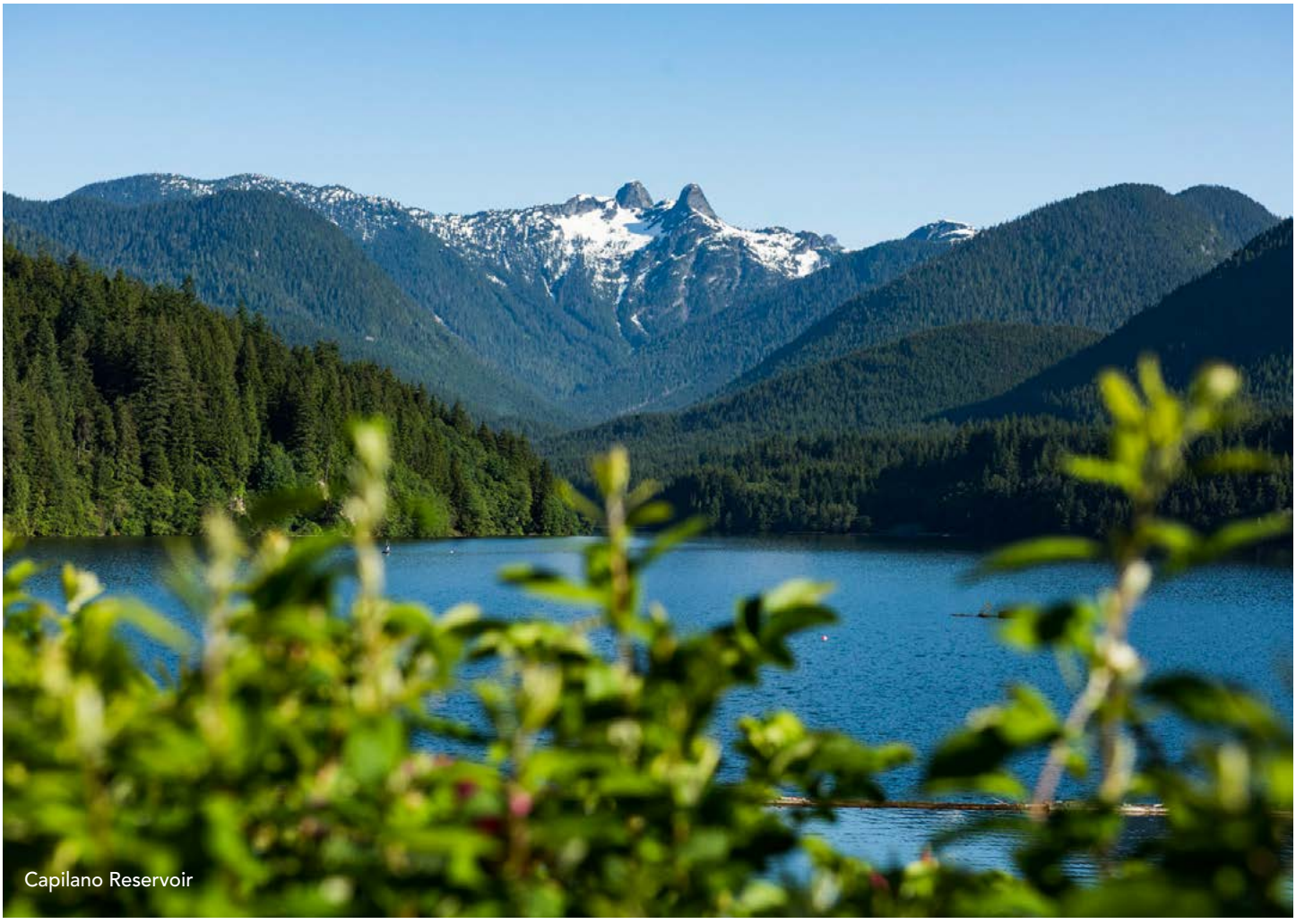
Total water demand is expected to increase in the coming years, due to population growth and potential slowing of the downward trend of per capita water use.



Water supply planning

To forecast future water supply, Metro Vancouver has developed modelling that simulates the key features that impact watershed inflows and outflows. The modelling takes into account factors including precipitation (rain, snow, and the influence of climate change), temperature, evaporation rates, and required flows for maintaining fish habitat.

Currently, Metro Vancouver's source reservoirs can be maintained nearly full under normal conditions from October to March. Snowpack typically starts melting around April, and the reservoirs are drawn down until early fall when the rain returns. As winters get warmer and wetter, and summers hotter and drier, less snowmelt will be available as inflow to sustain the reservoirs through the summer months, potentially creating a seasonal supply shortage.

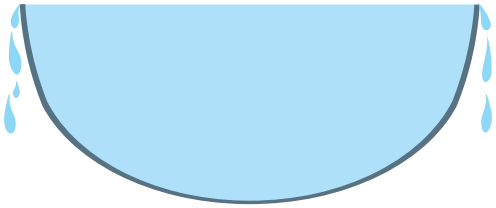


Capilano Reservoir

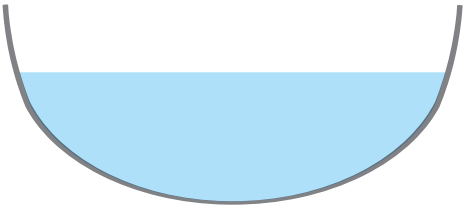
SUPPLY FORECAST MODELLING RESULTS

2018

Reservoir fills with rain
(snow stays on mountains)

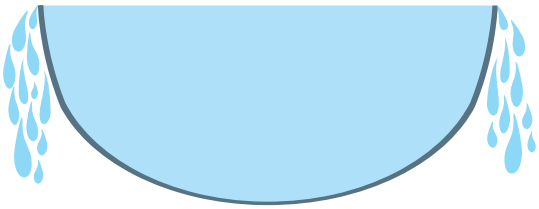


Reservoir fills with snowmelt from mountains
(less rain falls)

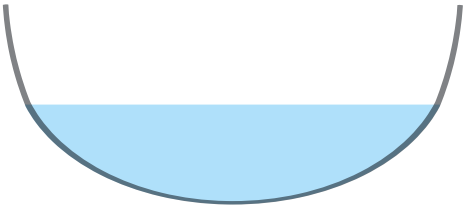


2080

Warmer, wetter
(less snow on mountains)



Hotter, drier
(less snowmelt from mountains)



Combining water demand forecasts with modelling of future reservoir inflows helps determine the potential need for additional water supply over time.

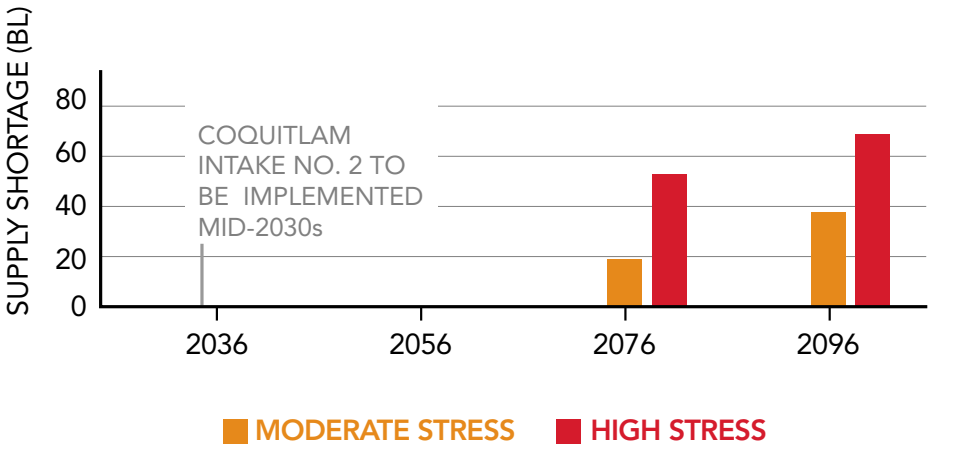
The supply shortage was calculated for each of the three planning scenarios – low, moderate, and high stress – from 2016 to 2116. Metro Vancouver has already initiated design of a second water intake at the Coquitlam Reservoir; this project is scheduled for implementation in the 2030s to improve access to additional source supply.

KEY FINDING

With the Coquitlam Intake No. 2 project in place, no water shortages are projected under the low-stress planning scenario. Under the moderate- and high-stress scenarios, an additional source supply is projected to be needed by approximately 2070 to avoid a shortage.

MAXIMUM ANNUAL WATER SHORTAGES

WITH COQUITLAM INTAKE NO. 2 PROJECT IMPLEMENTED



Coquitlam Reservoir, with the existing intake.

Future water supply options

A key purpose of *Water Supply Outlook 2120* is to evaluate water supply options that could be developed to ensure a reliable future supply of high-quality drinking water. Metro Vancouver identified a range of potential options, including water reuse and reclamation programs, expansion of existing sources, new sources within the region, and new sources outside of the region.

On-site reuse of wastewater, as well as rainwater harvesting and stormwater capture, are important options for supplementing Metro Vancouver water supplies and helping achieve local sustainability goals. However, on their own, these smaller-scale options do not currently offer sufficient water savings to significantly contribute to forecasted regional supply requirements.

Other potential options, such as seawater desalination, are very expensive to implement and are generally not cost-effective for a region such as ours with many other potentially available surface water sources. Groundwater, while currently used by some GVWD members as a supplementary local water supply, is less practical at the regional scale.

After initial assessment of a wide range of alternatives, seven options were shortlisted as the most feasible. Four of the options are expansions of existing Metro Vancouver water sources, two are new sources within the region, and one option is outside of the region.

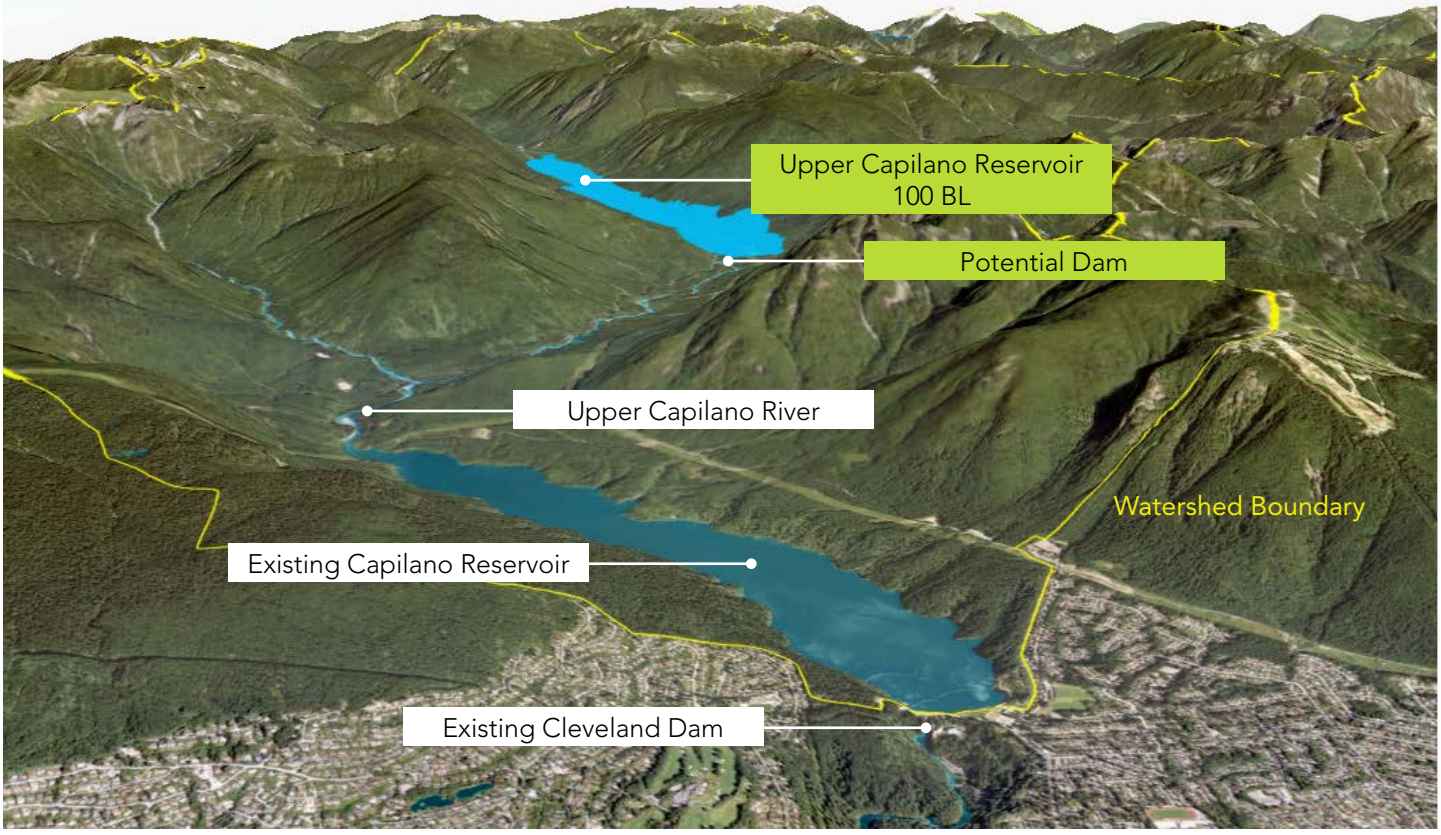
SHORTLISTED FUTURE WATER SUPPLY OPTIONS
(from west to east)

1

EXPANSION OF AN EXISTING SOURCE

Upper Capilano Watershed Dam

This option would include constructing a new dam and reservoir in the upper portion of the Capilano Watershed to expand this source of water supply. A 70-metre high dam would impound up to 100 billion litres of water. This option would require a new tunnel and water main from the dam to an expanded Seymour Capilano Filtration Plant for treatment, and new water mains would be built to convey treated water to the region. There is limited potential to raise the existing Cleveland Dam at the Capilano Reservoir due to various considerations, including current land use.

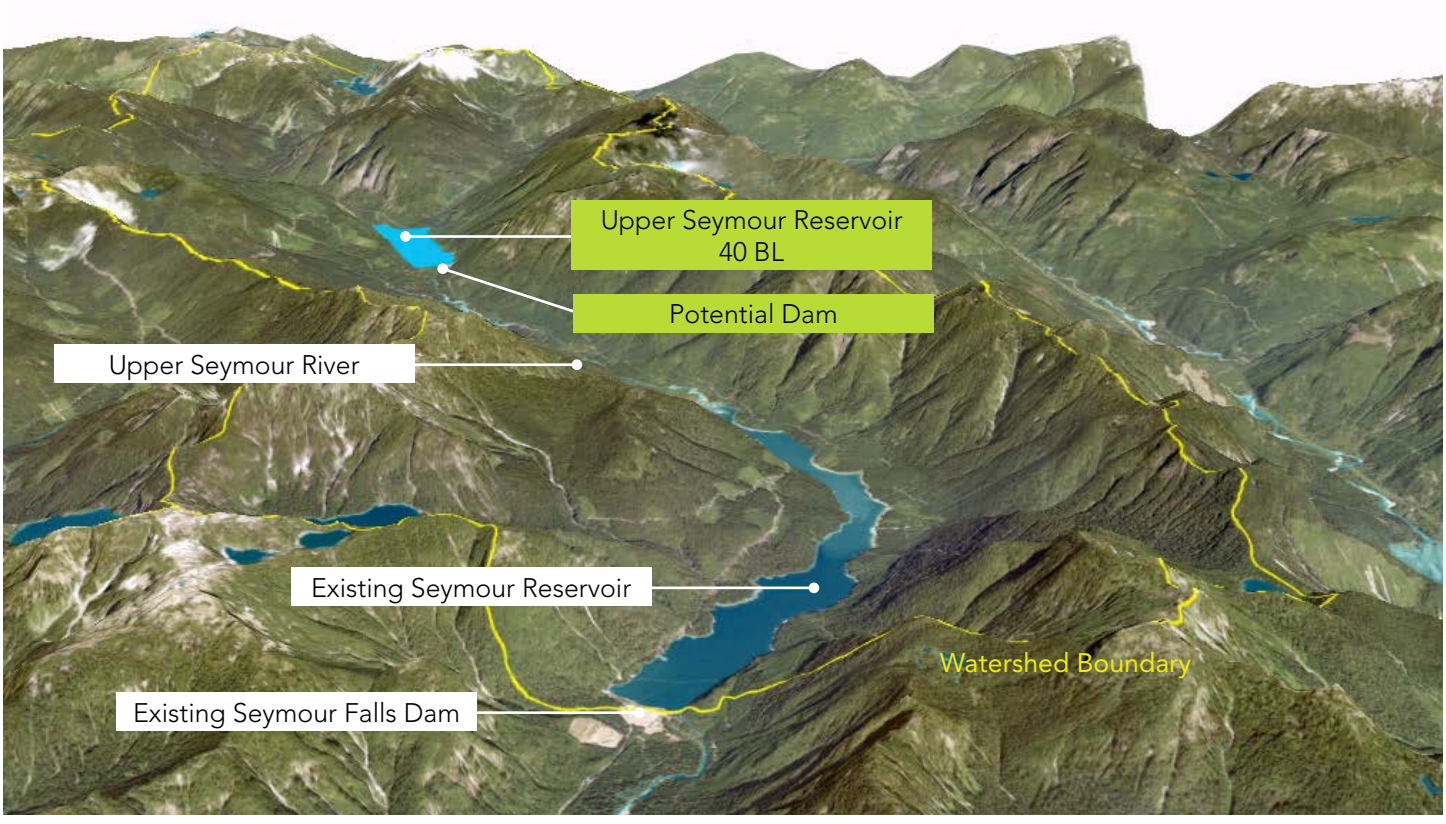


2

EXPANSION OF AN EXISTING SOURCE

Upper Seymour Watershed Dam

One of three options on the Seymour River, a 50-metre high Upper Seymour Watershed Dam would be sited upstream of the existing Seymour Reservoir. The new reservoir would increase storage capacity in the watershed by 40 billion litres. A new water main would move raw water south toward the existing Seymour Falls Dam, from where it would be conveyed to the Seymour Capilano Filtration Plant, which would require expansion at a later date.

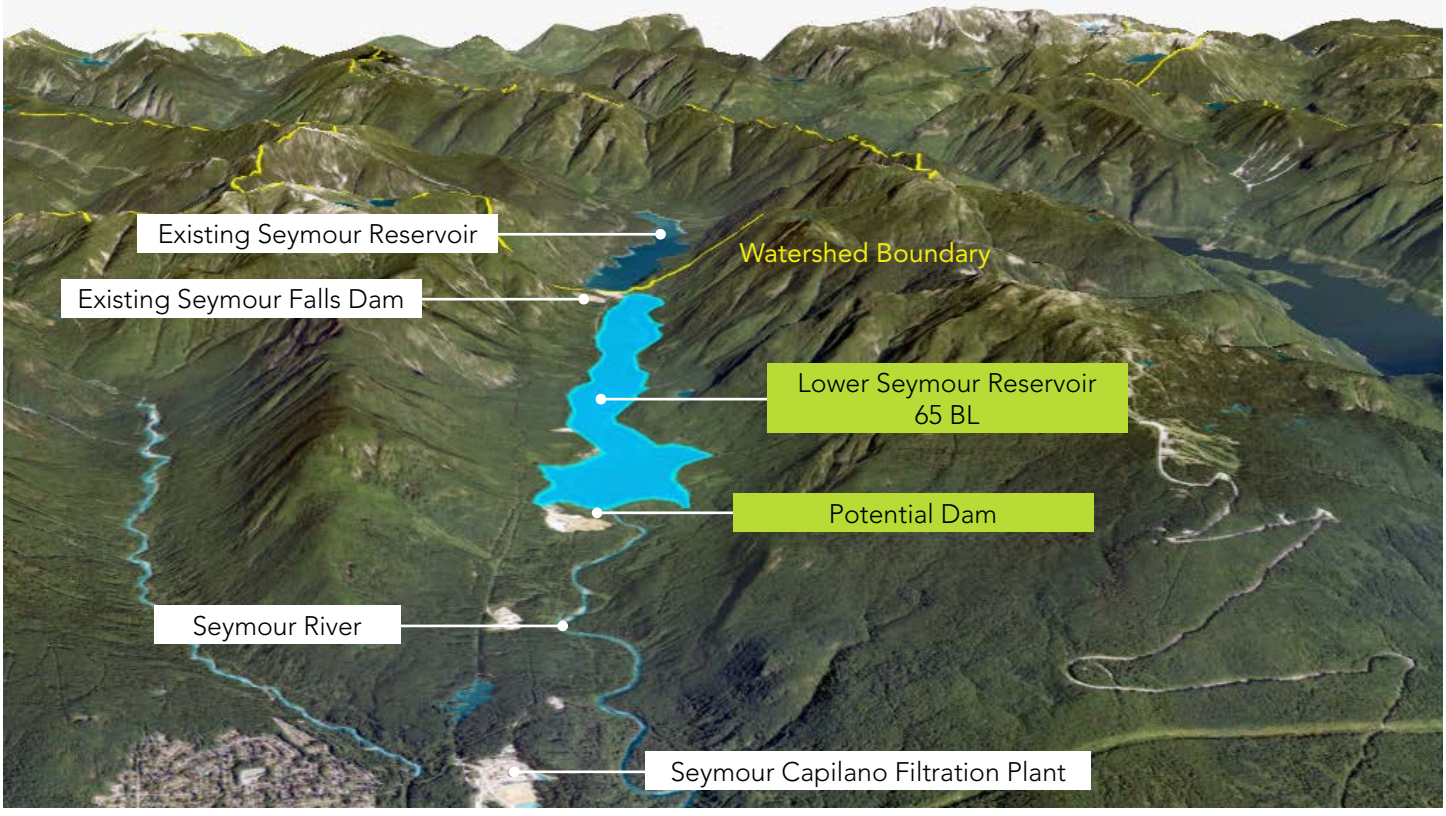


3

EXPANSION OF AN EXISTING SOURCE

Lower Seymour Watershed Dam

Another option in the Seymour Watershed is a new dam downstream of the existing Seymour Reservoir and within the Lower Seymour Conservation Reserve, which is currently maintained for recreational and education uses. The 60-metre high dam would impound approximately 65 billion litres of water and require a pump station and two water mains to move raw water to an expanded Seymour Capilano Filtration Plant, along with water mains to the transmission system. At full capacity, the reservoir would extend to near the base of the existing Seymour Falls Dam.

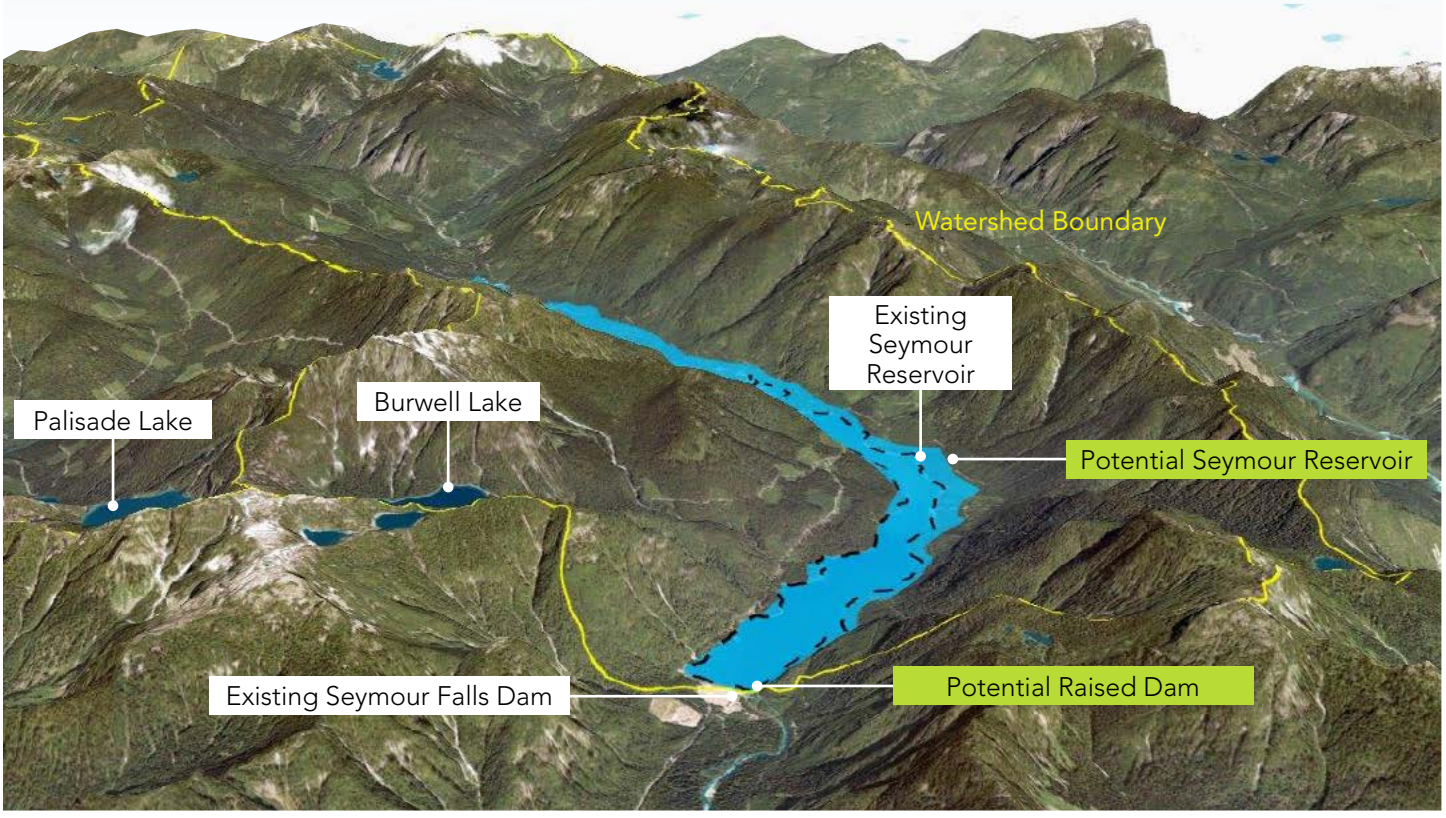


4

EXPANSION OF AN EXISTING SOURCE

Raised Seymour Falls Dam

Two options were considered to increase the capacity of the existing Seymour Reservoir: raising the height of the existing Seymour Falls Dam or building a new dam immediately downstream of the existing dam. The costs and complexity of raising the existing dam would likely be greater than building a new dam on its own. The new dam would be 53 metres high and impound an additional 145 billion litres of water. The amount of flooding required in this option is similar or less than other options, while providing significantly more storage capacity. This is due to the steep slopes surrounding the reservoir and favourable topography. Initially, this site would only require a short raw water main connecting to the existing Seymour Reservoir main, which delivers water to the Seymour Capilano Filtration Plant for treatment. Additional water mains and expansion of the Seymour Capilano Filtration Plant would be required later on as more supply is required from the reservoir.



5

NEW SOURCE WITHIN REGION

Pitt Lake Intake

Unlike the previous options that require a dam as part of their infrastructure, the Pitt Lake option accesses water through a lake intake structure, making it less prone to seismic concerns. Due to the size of the lake, and its capacity to store a high volume of water throughout the dry season, this option provides increased resiliency to climate change. Additionally this option is close to the existing transmission system. However, Pitt Lake has many current water uses and raw water quality is generally lower than in Metro Vancouver's pristine mountain watersheds, requiring higher levels of treatment. The Pitt Lake option would include a new mid-lake intake, raw water transmission to a new treatment plant, and connecting infrastructure to the regional transmission system. This option has relatively high operating costs, due to the higher levels of pumping and treatment required.

6

NEW SOURCE WITHIN REGION

Fraser River Intake

Like the Pitt Lake option, the Fraser River provides an option for a potential drinking water source with reduced seismic concerns because it uses an intake structure instead of a dam. It has access to a very large water source, which increases resiliency to climate change impacts, and is close to the transmission system serving several of Metro Vancouver's member jurisdictions. However, the river receives a number of discharges from industrial and other users, and the water quality is variable and would require higher levels of treatment. An intake on the river would account for future increases in upstream salinity due to potential sea level rise. A water treatment plant would be constructed close to the proposed intake, and a new pump station would move treated water from the plant through twin water mains before connecting to the transmission system.

7

NEW SOURCE OUTSIDE OF REGION

Harrison Lake Intake

Harrison Lake is an example of a water supply option outside of Metro Vancouver's service area. The lake has a much larger catchment area than the other reservoir options, providing greater climate resiliency and proximity to expanding populations in the eastern parts of the region. However, unlike Metro Vancouver's existing source reservoirs, this option could not take full advantage of gravity for transmission. A new intake on Harrison Lake would require raw water transmission and pumping to a new treatment plant. Eighty-seven kilometres of new water main would be required to connect to the Metro Vancouver transmission system, along with significant pumping capacity. Harrison Lake's water quality is expected to be variable and would require higher levels of treatment. Harrison Lake has the highest associated costs of the shortlisted options, largely due to the extensive pumping required and the construction and maintenance of the lengthy transmission main.

Future water supply options evaluation

Each shortlisted water supply option was evaluated according to key criteria:

- environmental sustainability (impact on forests, greenhouse gas emissions, fisheries and watershed habitats, and urban environment);
- system integration (efficiency of integration and alignment with existing Metro Vancouver water system infrastructure);
- implementation complexity (impact on neighbourhoods and recreation opportunities, and regulatory approvals required);
- cost-effectiveness (estimated capital costs to build and operate the infrastructure components); and
- supply reliability (capacity of the source to reduce or eliminate future water shortages, and resiliency to natural hazards and extreme weather events).

Seymour Capilano Filtration Plant.

KEY FINDING

The option of building a new higher dam at Seymour Falls was identified as the most likely potential project for long-term water supply. A higher dam would provide storage capacity for an additional estimated 145 billion litres of water, eliminating the forecasted future supply shortage for at least the next 100 years under all demand scenarios.

ACTION

Metro Vancouver is initiating a Facility Master Plan that will confirm the detailed conveyance upgrading required to deliver sufficient supplies to GVWD members.

Evaluation summary

The four water supply options within Metro Vancouver's watersheds rate more favourably than the other short-listed options because they integrate well with the existing water treatment and transmission system. Their use of existing infrastructure also makes them more cost effective. Because these watershed options expand an existing water supply, the regulatory approval process could potentially be less complex than with options outside of the watersheds and the region. Each of these options will require careful evaluation to determine the most practical supply source that will be developed to meet future needs of the region.

The three options outside of Metro Vancouver's watersheds - two inside the region and one outside the region - tend to rate less favourably than options within the watersheds. These options would not require flooding, thereby increasing their environmental sustainability rating, and offer high supply reliability. However, they would require extensive pumping to integrate well with the existing system. A major drawback for the Harrison Lake option is the cost and implementation complexity of building a water main with an estimated length of 87 km. Of the three options outside Metro Vancouver's watersheds, the Pitt Lake option could meet regional needs under certain conditions; e.g., if future regional growth is much more focused in the eastern communities, eventually requiring additional supply beyond that provided by the Coquitlam Intake No. 2 project.

The evaluation results identified several highly viable water supply options that could be implemented after mid-century to meet the region's needs. Metro Vancouver plans to revisit the full evaluation every ten years with integration of the latest available information, including factors such as population growth, demand trends, and viability of large-scale water reuse. The viability of water supply options or combinations of options can be reconsidered at that time.

Seymour Falls Dam.

FUTURE WATER SUPPLY OPTIONS SUMMARY

	SHORTLISTED OPTIONS (From west to east)	ASSUMPTIONS	ESTIMATED ADDITIONAL NEW STORAGE CAPACITY
1	**Upper Capilano Watershed Dam**	New 70-m high dam and reservoir	100 BL
2	**Upper Seymour Watershed Dam**	New 50-m high dam and reservoir	40 BL
3	**Lower Seymour Watershed Dam**	New 60-m high dam and reservoir	65 BL
4	**Raised Seymour Falls Dam**	New 53-m high dam and expanded reservoir	145 BL
5	**Pitt Lake Intake**	Provides treated water to eastern communities from a new screened freshwater lake intake	N/A†
6	**Fraser River Intake**	Provides treated water to south-eastern communities from a new screened freshwater river intake	N/A†
7	**Harrison Lake Intake**	Provides treated water to eastern communities from a new screened freshwater lake intake	N/A†

† These intake options do not create new storage volume; existing storage at these proposed sites already exists significantly in excess of projected needs.

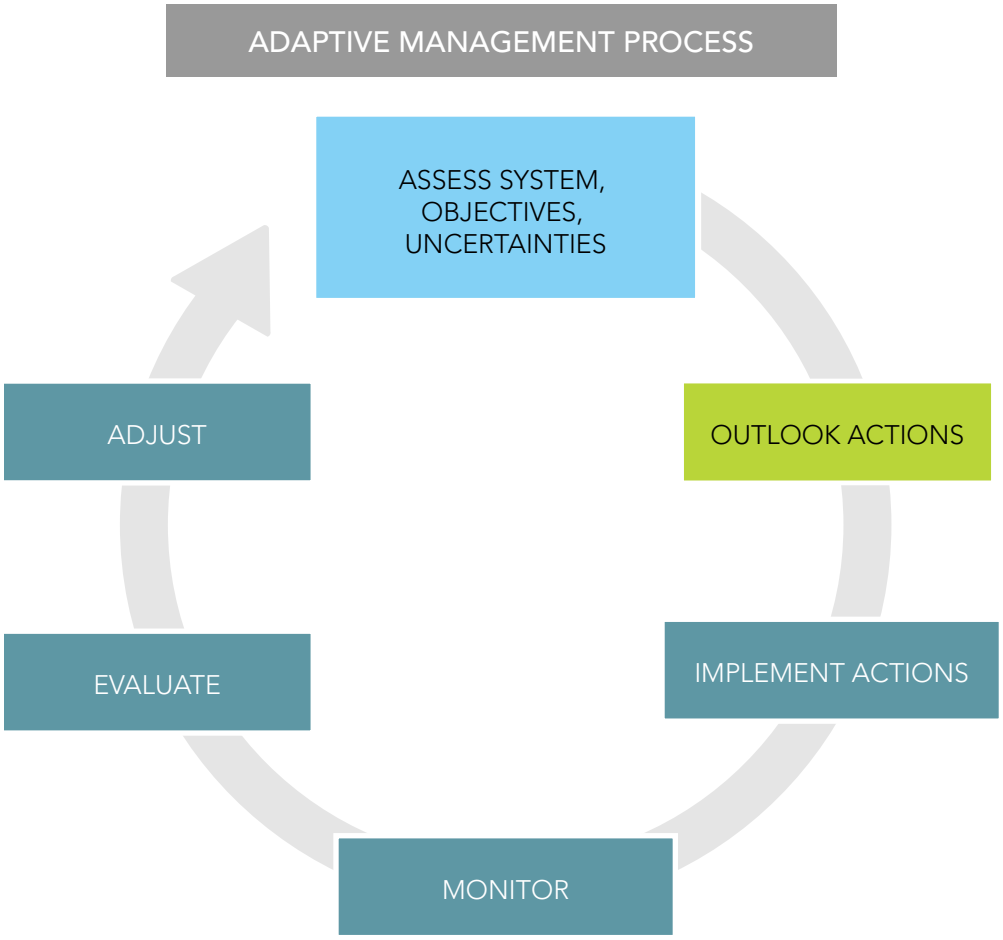
Ongoing review and adjustment

Metro Vancouver has evaluated future water demands and supplies under various planning scenarios, including population growth, climate change, local water supplies, and other factors.

The use of planning scenarios is a well-established method and appropriate to use when forecast horizons are 50 to 100 years, as the future will always be uncertain. However, large capital infrastructure projects, such as dams and water supply intakes often take decades to study, design, and construct due to project complexity.

An adaptive management process is therefore key to balancing the need for advanced planning and flexibility to adjust project development if future conditions change.

A ten-year cycle is anticipated for full re-assessment of long-term supply options, which will include progressing to more detailed costing of highly viable options and further research into large-scale water reuse.



Key actions

Metro Vancouver intends to update *Water Supply Outlook 2120* every ten years, with the option for amendments along the way.

The top three ranked options – Raised Seymour Falls Dam, Upper Capilano Dam, and Upper Seymour Dam – will be considered further to determine feasibility and refine costing. This will help ensure that Metro Vancouver will be well-positioned to proceed with design and construction as and when appropriate, with the potential to address any unforeseen challenges early. Each of these options would make best use of existing treatment facilities, with planned expansion at or near the existing site, where feasible.

The following are key actions of *Water Supply Outlook 2120*:

- A Facility Master Plan is being initiated to identify specific conveyance upgrading requirements.
- Metro Vancouver will refine *Water Supply Outlook 2120* as additional details and information about climate change trends and impacts become available (e.g., latest scientific understanding of climate change).
- Metro Vancouver has completed the Port Mann Water Supply Tunnel and is in the process of upgrading four other critical marine crossings under Burrard Inlet and the Fraser River to help ensure reliable water supply following a major earthquake.
- Some of Metro Vancouver's pump stations and other facilities are not equipped with the back-up power supply that is needed to ensure resiliency and continued operation during power outages. Phased and prioritized implementation is underway on critical infrastructure.
- Metro Vancouver is continuing water conservation education and behaviour change efforts.
- Metro Vancouver is further investigating the potential for expanded water reuse (e.g., rainwater harvesting and greywater), to supplement and/or potentially defer the need for other long-term supply upgrades.
- Metro Vancouver will integrate relevant key actions into the *Drinking Water Management Plan*.

Capilano Reservoir.


metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION