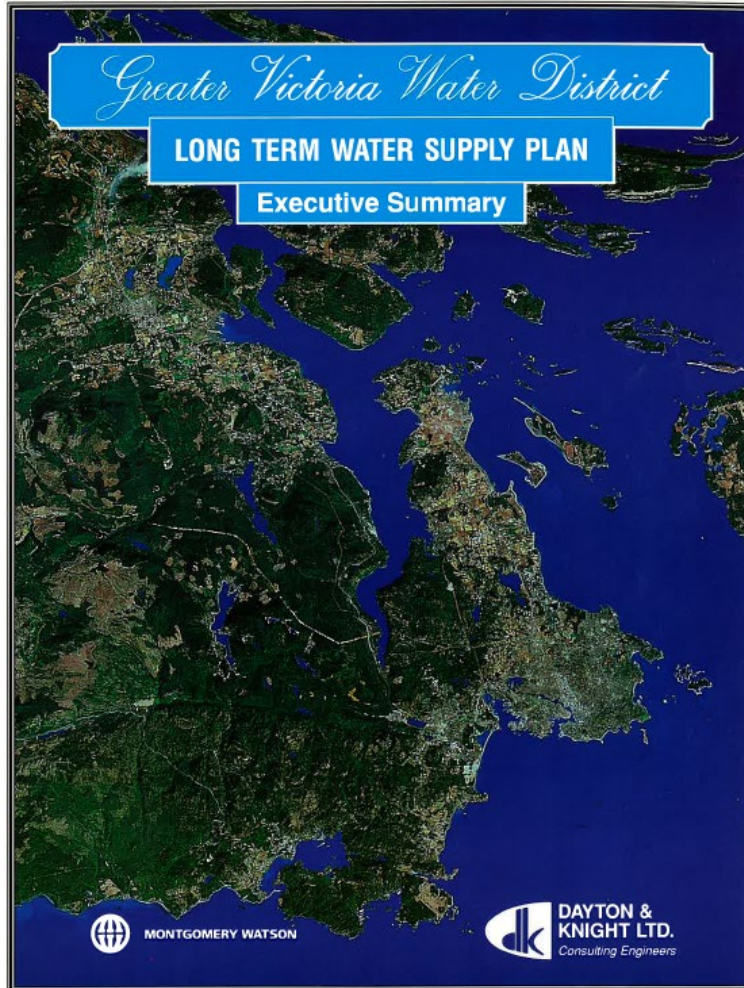


# 2022 Long Term Water Supply Master Plan



Regional Water Supply Commission  
May 18, 2022



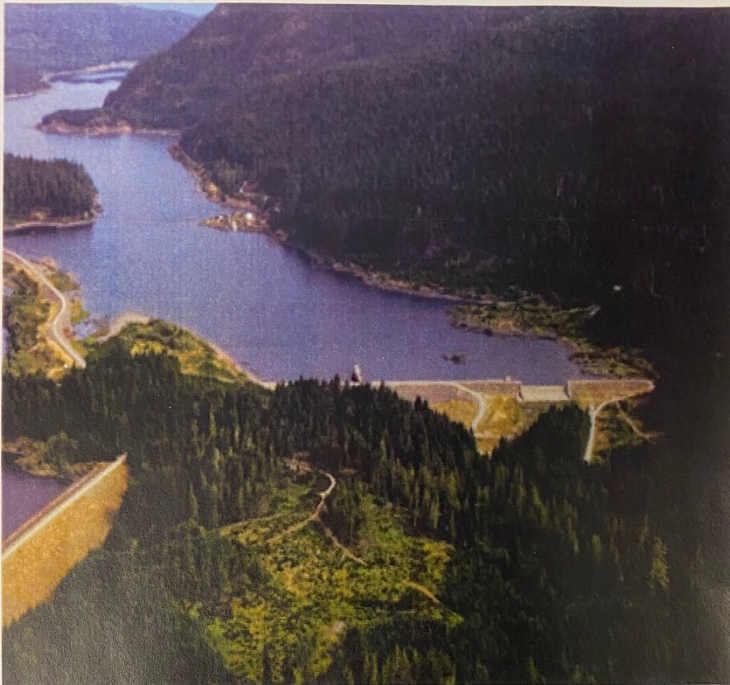
## Key projects completed since 1994:

- Rehabilitate Goldstream Reservoirs/Dams
- UV Disinfection
- Raise Sooke Lake Reservoir Dam
- District of Sooke supply and treatment (replace Charters Treatment Plant) – Transmission Main #15 & SRRDF
- Replace Transmission Main #1

## Other recommended considerations in 1994:

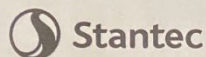
- Filtration
- Sooke Lake Deep Northern Intake
- Leech River diversion
- Second major transmission system from Sooke Lake Reservoir
- Goldstream
- Additional balancing storage

CRD/IWS REPORT NO. 1186



Capital Regional District | Regional Water Supply  
2022 Master Plan

MAY 2022



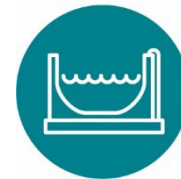
## Primary elements of 2022 Master Plan:

- Future water demand
- Water supply
- Water quality and treatment
- Treated water balancing storage
- Water transmission system



### COMMITMENT:

Provide high quality, safe drinking water



### COMMITMENT:

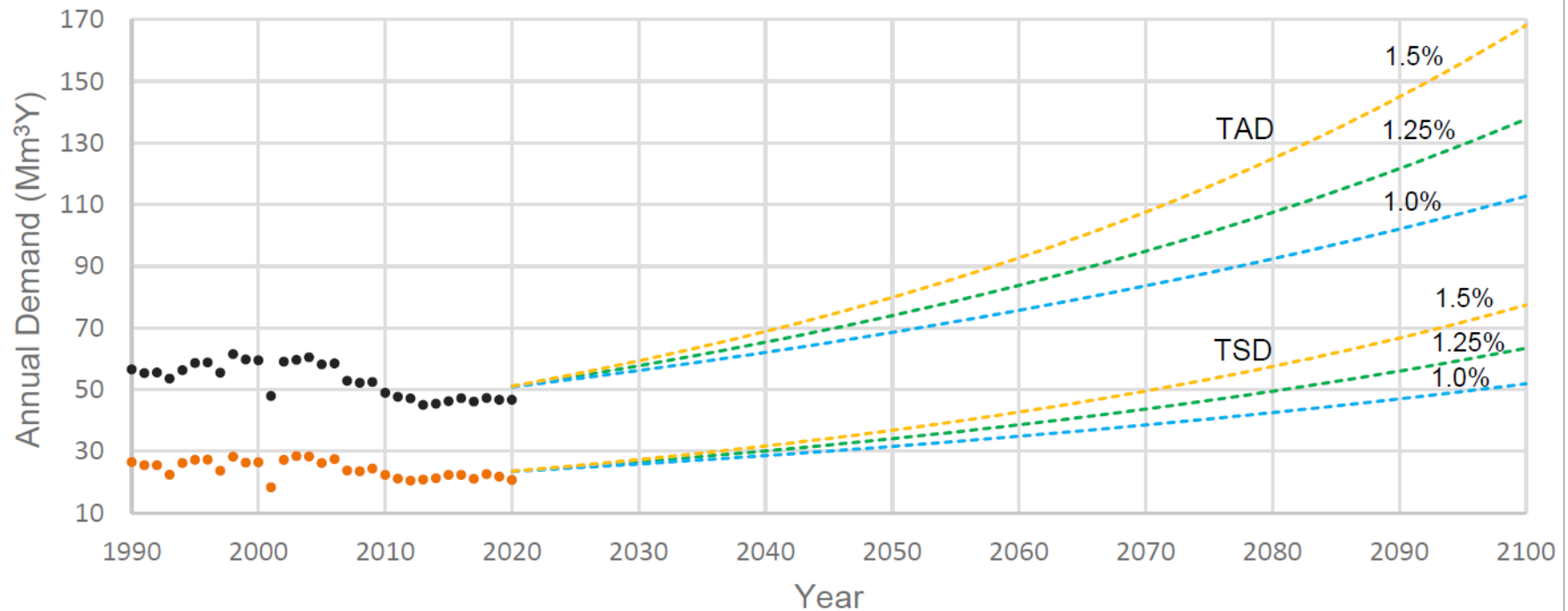
Provide an adequate, long-term supply of drinking water



### COMMITMENT:

Provide a reliable and efficient drinking water transmission system

# Total Annual & Summer Demands – 2020 to 2100

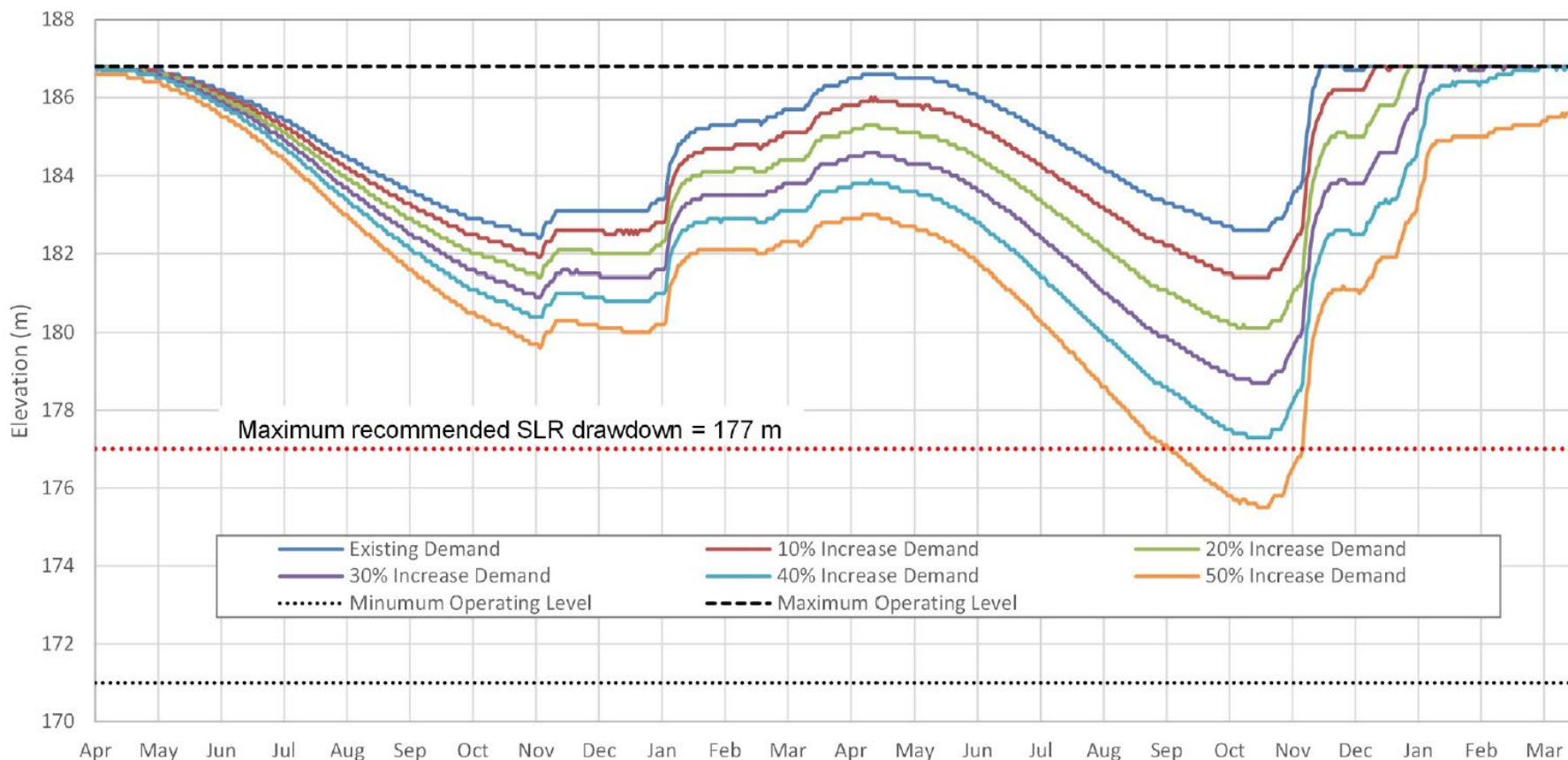


TAD – Total Annual Demand

TSD – Total Summer Demand

Population growth rates (%) - (low/medium/high)

# Sooke Lake Reservoir – Demand Scenarios\*



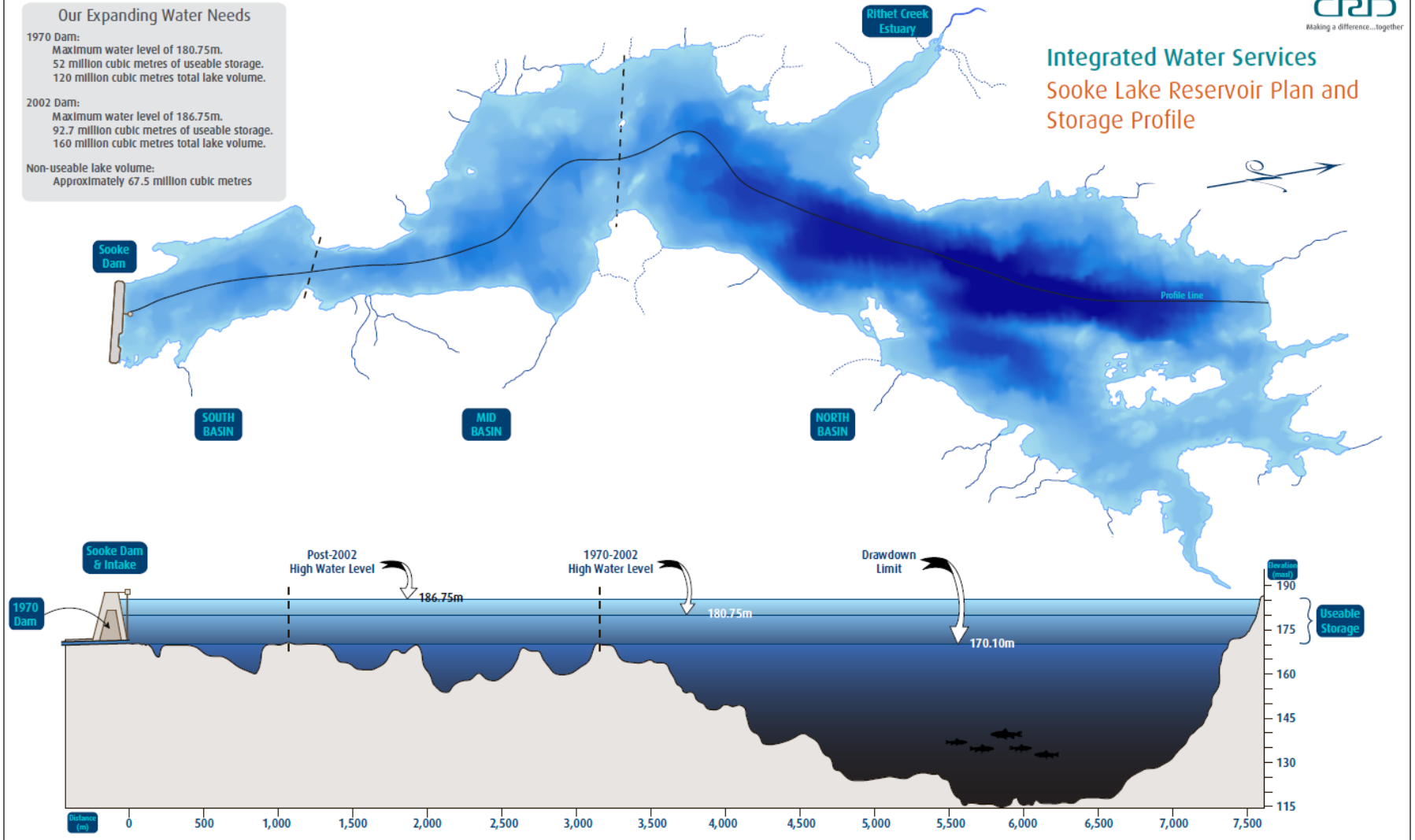
\*Simulated Water Level in Sooke Lake Reservoir for a 1:50 Dry Precipitation Year Followed by an Average Precipitation Year with different Demand Scenarios

# Sooke Lake Reservoir Plan and Profile

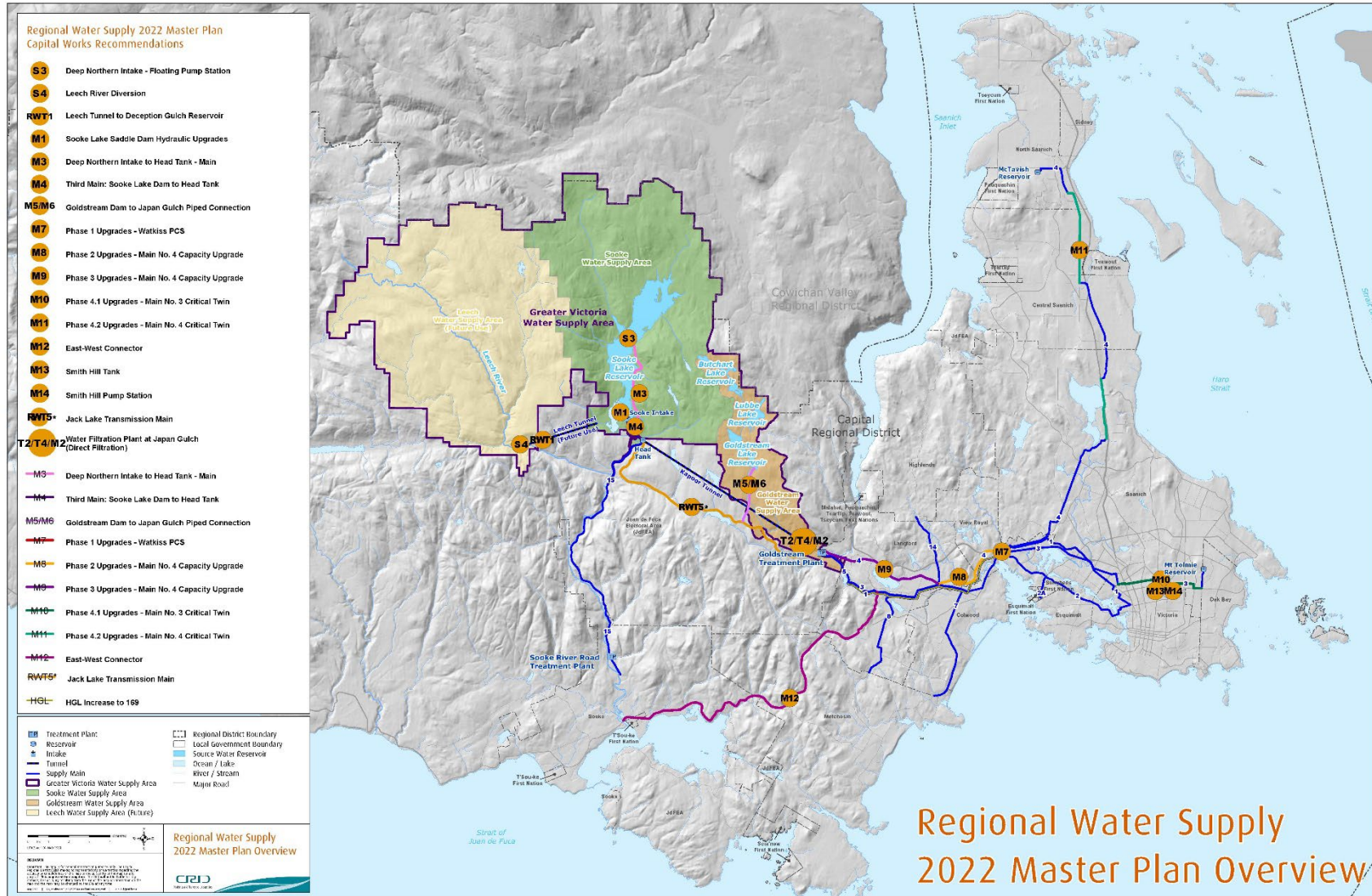
## Our Expanding Water Needs

- 1970 Dam:**  
Maximum water level of 180.75m.  
52 million cubic metres of useable storage.  
120 million cubic metres total lake volume.
- 2002 Dam:**  
Maximum water level of 186.75m.  
92.7 million cubic metres of useable storage.  
160 million cubic metres total lake volume.
- Non-useable lake volume:**  
Approximately 67.5 million cubic metres

## Integrated Water Services Sooke Lake Reservoir Plan and Storage Profile



# 2022 Master Plan: Overview



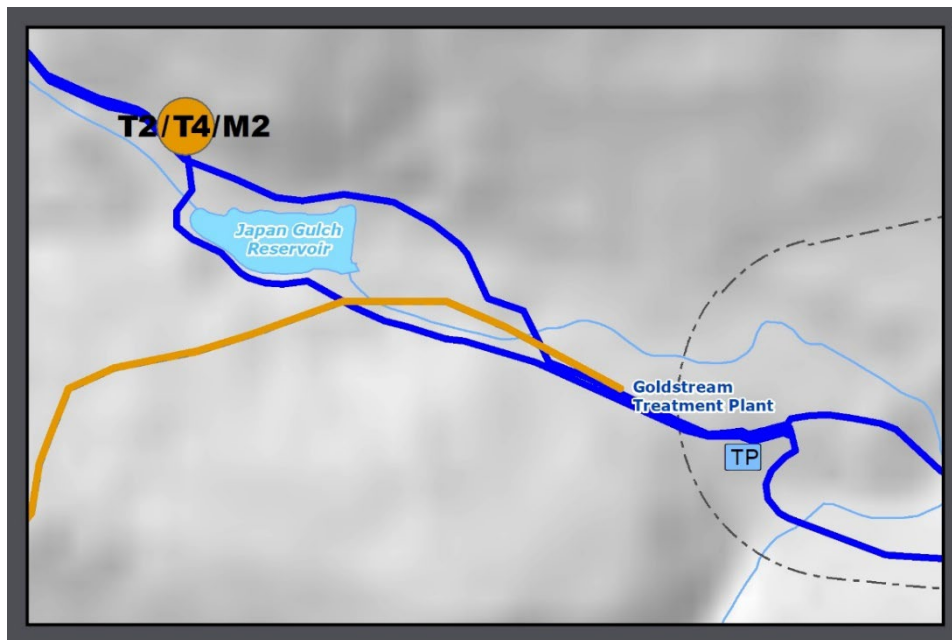
Regional Water Supply  
2022 Master Plan Overview

# Goldstream Water Filtration Plant (T2/T4/M2)



## COMMITMENT:

Provide high quality, safe drinking water



Estimated Cost: \$1.07 Billion

A direct filtration plant located upstream of the Goldstream Disinfection Facility to better protect the Regional Water Supply from potential raw water quality fluctuations due to climate change, forest fires and the eventual integration of water from the Leech and Goldstream Water Supply Areas.

Includes a pump station, clearwell, balancing tank and the decommissioning of the Japan Gulch Dam and Reservoir.

## Project Timeline:



SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE



CLIMATE CHANGE IMPACTS - MITIGATION AND ADAPTATION

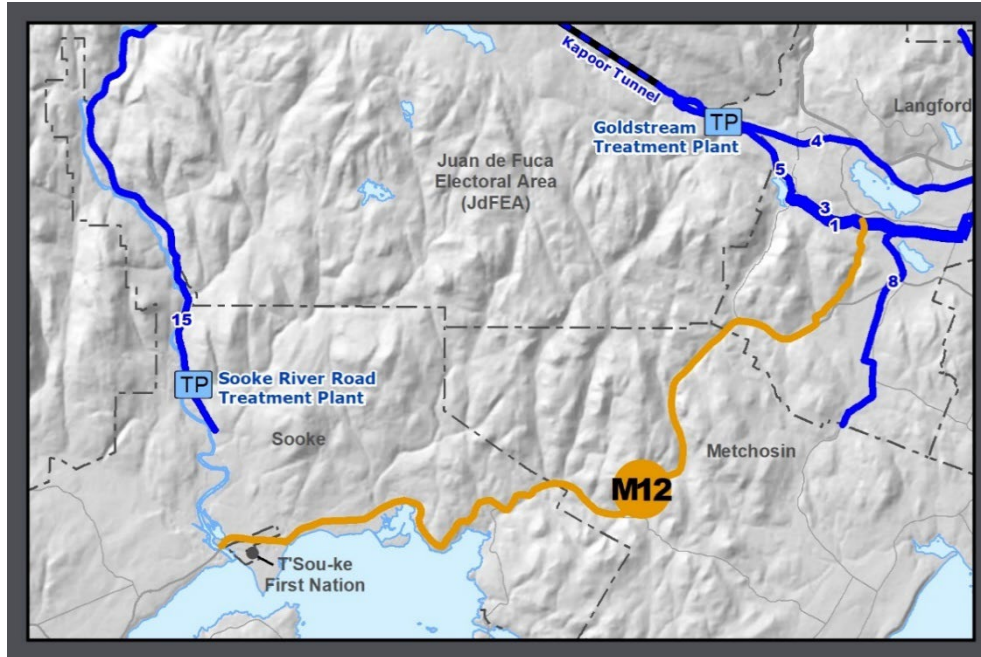


# East – West Connector (M12)



## COMMITMENT:

Provide a reliable and efficient drinking water transmission system



Estimated Cost: \$77.64 Million

A transmission main to connect the proposed Filtration Plant with the Juan de Fuca Water Distribution Service.

## Project Timeline:



SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE

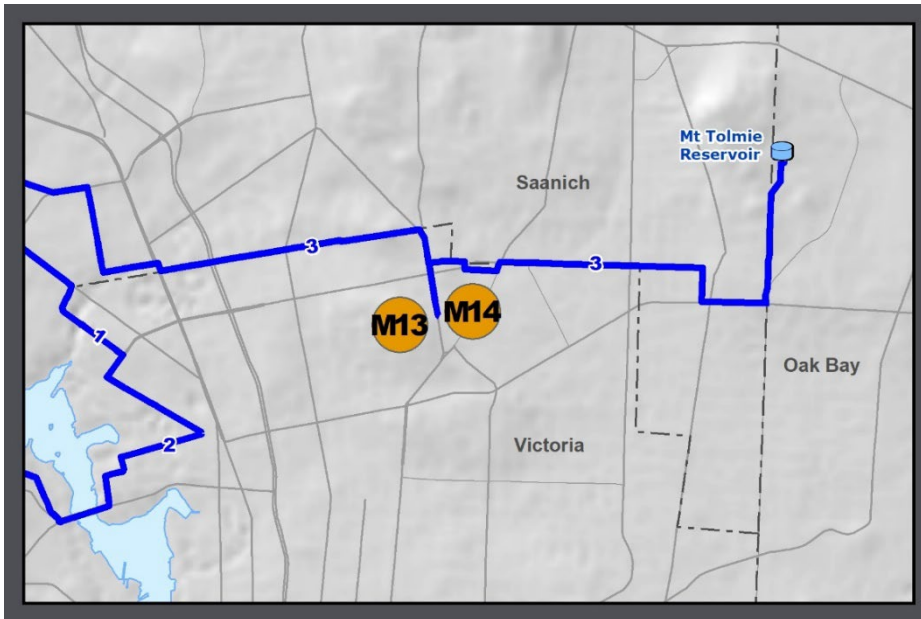
# Smith Hill Tank and Pump Station (M13/M14)



## COMMITMENT:

Provide a reliable and efficient drinking water transmission system

Estimated Cost: \$41.75 Million



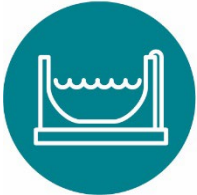
A storage tank and associated pump station at the existing, decommissioned Smith Hill site to provide a number of benefits including emergency storage, balancing of instantaneous/peak demands, reduce the capacity required at treatment plants, reduce risk of transient pressure surges, reduce head losses and deferral of transmission main hydraulic upgrade.

## Project Timeline:



SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE

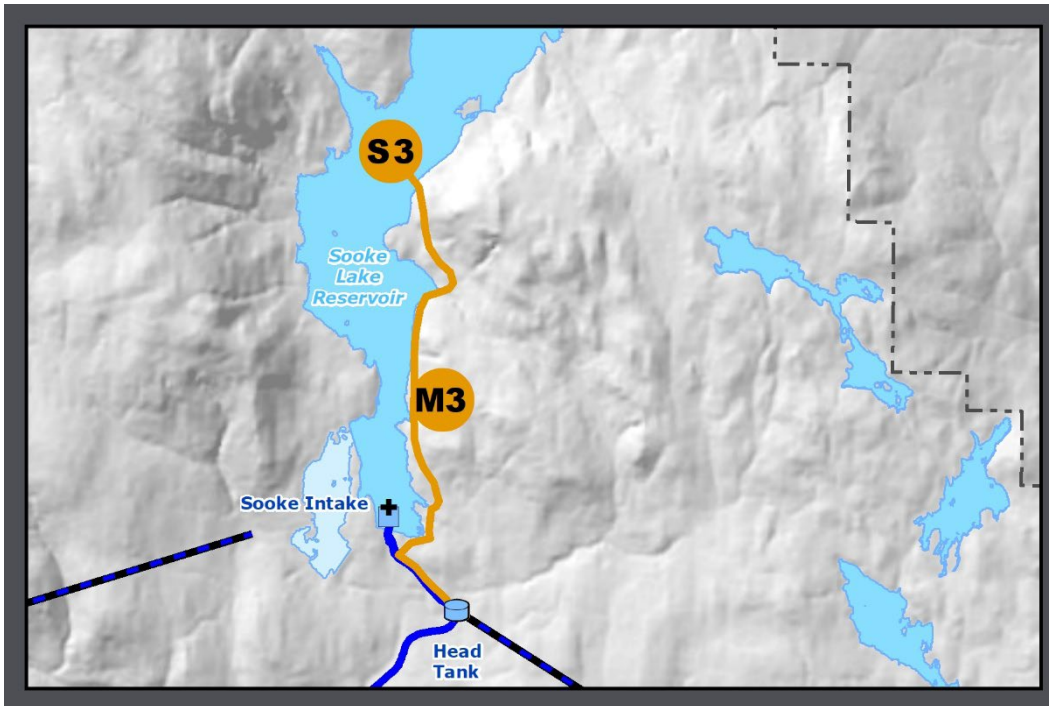
# Deep Northern Intake- Floating Pump Station (S3) and Transmission Main to Head Tank (M3)



## COMMITMENT:

Provide an adequate, long-term supply of drinking water

Estimated Cost: \$135.41 Million



A second intake and raw water transmission main pumped to the Head Tank to add redundancy to the existing single southern intake, allow access to deeper, high quality water and allow for further drawdown of the Sooke Lake Reservoir to increase supply.

## Project Timeline:



PREPARING FOR EMERGENCY AND POST-DISASTER WATER SUPPLY



SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE

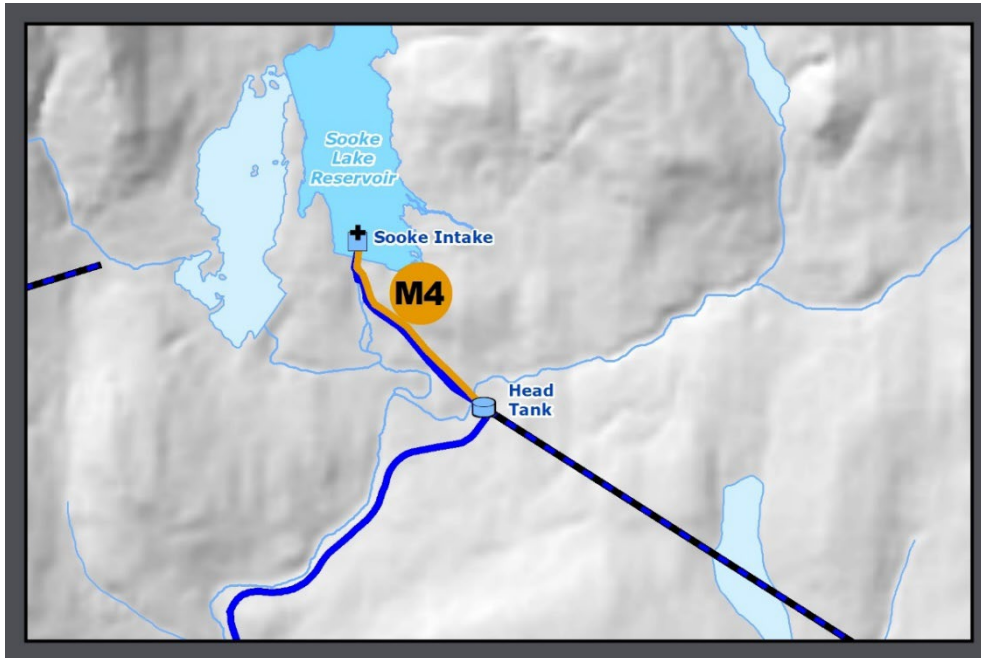
# Third Main: SLD to Head Tank (M4)



## COMMITMENT:

Provide a reliable and efficient drinking water transmission system

Estimated Cost: \$9.13 Million



A third raw water main extending between the Sooke Lake Dam and the Head Tank to increase capacity, improve redundancy and ensure service continuation in the event of a natural disaster or failure.

## Project Timeline:



SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE



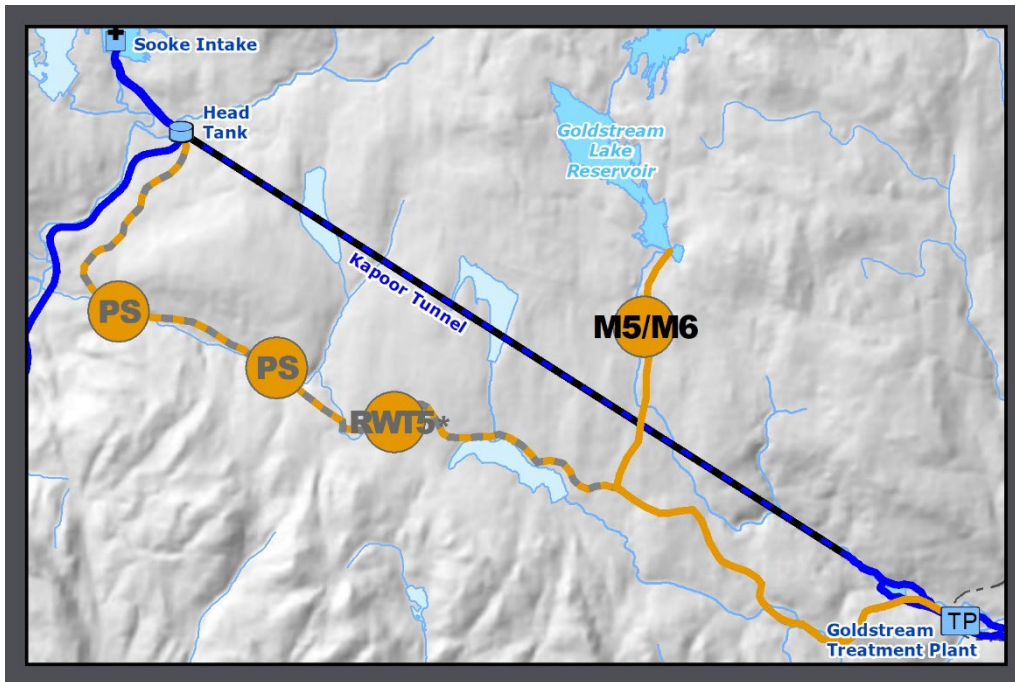
PREPARING FOR EMERGENCY AND POST-DISASTER WATER SUPPLY

# Goldstream Reservoir Connector (M5) Including Stage 1 Balancing Tank (M6)



## COMMITMENT:

Provide a reliable and efficient drinking water transmission system



Estimated Cost: \$89.82 Million

A piped connection between Goldstream Lake Reservoir and the proposed Goldstream Treatment Plant to protect the water quality of the secondary water supply for use during emergencies, Kapoor Tunnel shut down, and eventually allow Kapoor Tunnel redundancy and increased raw water transmission capacity.

## Project Timeline:



SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE



PREPARING FOR EMERGENCY AND POST-DISASTER WATER SUPPLY

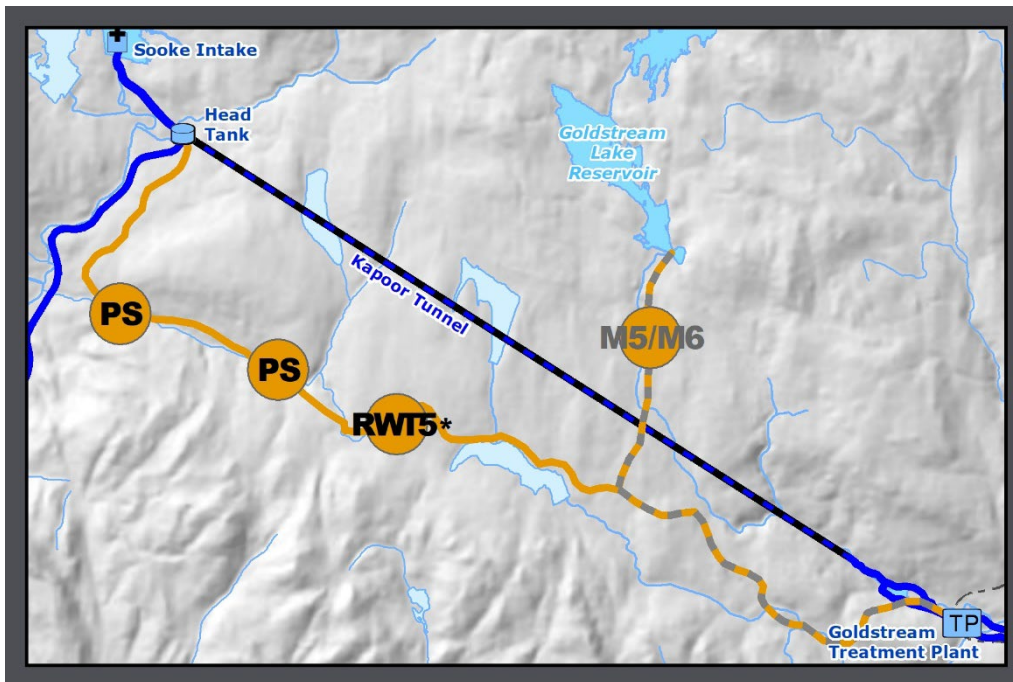
# Jack Lake Raw Water Transmission Main (RWT5)



## COMMITMENT:

Provide a reliable and efficient drinking water transmission system

Estimated Cost: \$284.96 Million



A piped connection between the existing Head Tank and Goldstream Treatment Plant to provide redundancy to the Kapoor Tunnel for backup or emergency purposes and increased raw water transmission capacity.

## Project Timeline:

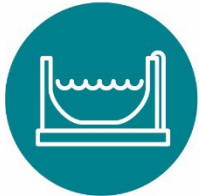


PREPARING FOR EMERGENCY AND POST-DISASTER WATER SUPPLY



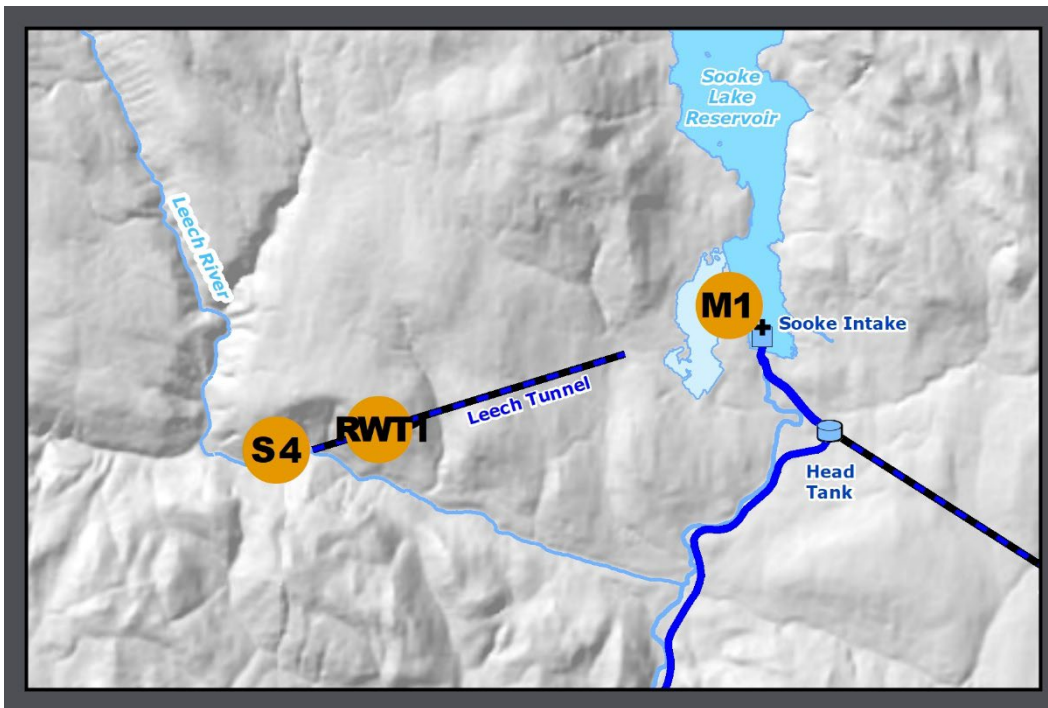
SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE

# Leech River Diversion (S4/RWT1) and Sooke Lake Saddle Dam Hydraulic Upgrades (M1)



## COMMITMENT:

Provide an adequate, long-term supply of drinking water



Estimated Cost: \$41.9 Million

An intake structure to divert Leech River water through the existing Leech Tunnel to Deception Gulch Reservoir as a supplemental source to Sooke Lake Reservoir.

Sooke Lake Saddle Dam and Deception Gulch Dam will both require upgrades in order to transfer water from Deception Gulch Reservoir to Sooke Lake Reservoir.

## Project Timeline:



SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE



PLANNING FOR THE FUTURE USE OF THE LEECH WATER SUPPLY AREA

# Treated Water Transmission Main Upgrades (Phases 1-4.2) (M7, M8, M9, M10, M11)



## COMMITMENT:

Provide a reliable and efficient drinking water transmission system



Estimated Cost: \$295.42 Million

A variety of renewal and capacity-related transmission system upgrades throughout the Regional Water Supply (RWS) aligned into a \$10M/year re-occurring annual program.

## Project Timeline:

2027-2050

Annual Program



SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE



DEMAND MANAGEMENT - ADDRESSING CHANGING TRENDS IN WATER DEMAND



## Financial Implications of 2022 Master Plan:

- Capital and operating costs
- Funding – debt financing and cash contributions
- Financial health of Regional Water Supply Service
- Future water rates



CRD BOARD PRIORITIES -  
SUSTAINABLE AND LIVABLE REGION



CLIMATE CHANGE IMPACTS -  
MITIGATION AND ADAPTATION



DEMAND MANAGEMENT -  
ADDRESSING CHANGING TRENDS  
IN WATER DEMAND



PLANNING FOR THE FUTURE USE  
OF THE LEECH WATER SUPPLY AREA

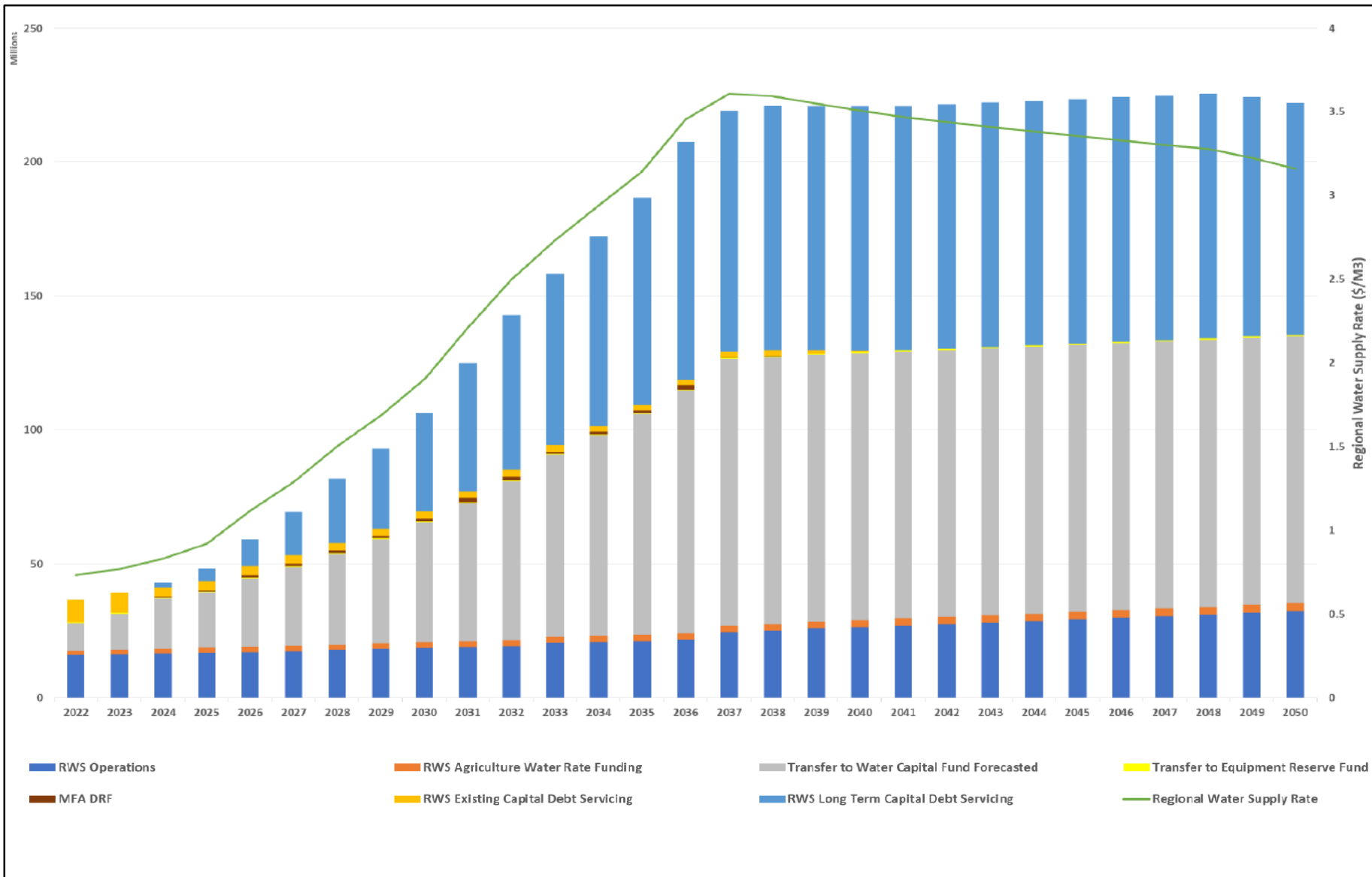


SUPPLY SYSTEM INFRASTRUCTURE  
INVESTMENT - RENEWING EXISTING  
AND PREPARING FOR NEW  
INFRASTRUCTURE



PREPARING FOR EMERGENCY AND  
POST-DISASTER WATER SUPPLY

# RWS Service Conceptual Operating and Capital Cost & Rate Model



- RWS Commission presentation and feedback
- CRD Board
- Water Advisory Committee & Public feedback
- Report consolidated feedback to RWS Commission & seek Commission endorsement
- Begin implementation (subject to RWS Commission and CRD Board direction) through 5 year capital plan and budget process



Sooke Lake Reservoir and Watershed