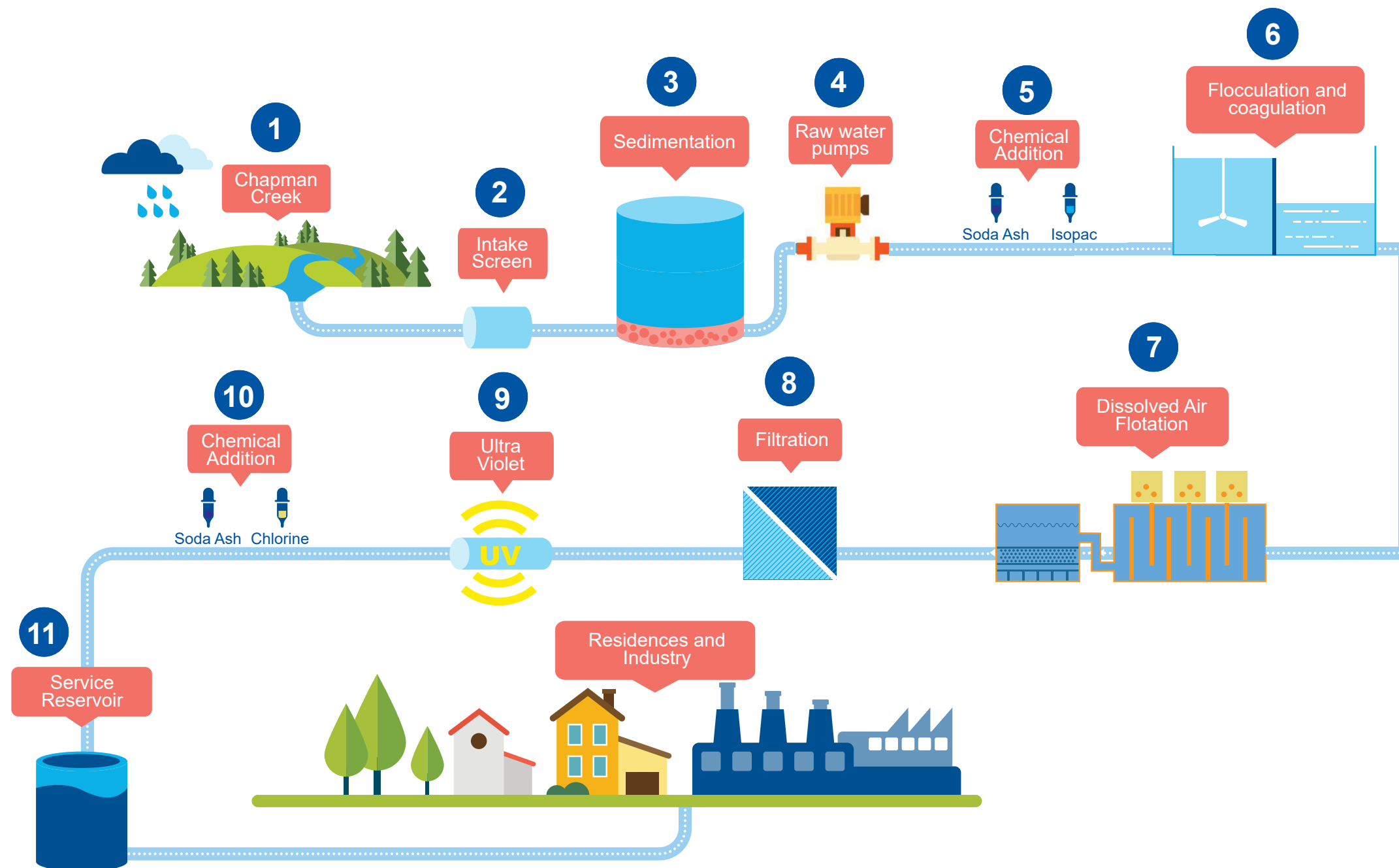




From Source to Tap:

The Sunshine Coast Regional District's Water Treatment and Water Monitoring Process



The Chapman Creek Water Treatment Plant was placed into operation in March 2004. The total construction cost was \$7 million. \$3.8 million was paid through a Canada/BC Infrastructure grant. The water treatment process consists of chemical injection and rapid mixing, coagulation and flocculation, clarifying by flotation, filtration and disinfection. Ultraviolet light is used as the primary disinfection system followed by chlorine disinfection. The plant is operated with one operator on day shift, seven days a week. There are trained operators who share the work on a rotational basis throughout the year.

- 1 Chapman Creek:** Water flows from Chapman Lake and Edwards Lake to Chapman Creek.
- 2 Intake Screen:** Stops sticks, fish and debris from entering the intake.
- 3 Sedimentation:** The primary settling chamber slows the velocity of the water so heavy solids settle out.
- 4 Raw water pumps:** Low lift pumps pump the raw water up the hill to the plant. For most areas, these are the only lift pumps in the process.
- 5 Chemical Addition:** A coagulant called Isopac is added to form floc that removes the color and turbidity from the raw water. Soda ash is added to raise the pH for optimal treatment.
- 6 Flocculation and coagulation:** Isopac is used as the coagulant, which results in the clumping together of fine particles which cause colour and turbidity into larger particles called floc. Once the Isopac has been injected into the raw water, the water enters the flocculation tanks where it is gently mixed.
- 7 Dissolved Air and Flotation (DAF):** Water then goes to the DAF tank. The DAF tank has diffusers along the bottom that release air bubbles. The air picks up the floc as it rises to the surface creating a scum. The scum is removed and the treated water leaves via a perforated pipe at the bottom.
- 8 Filtration:** Anthracite coal and sand layer the bottom of each filter. The water enters from the top and trickles through the media to a collection drain.
- 9 Ultraviolet:** Ultraviolet light is used as the primary disinfection system just before the treated water leaves the plant.
- 10 Chemical Addition:** Chlorine is a secondary disinfectant added in the outflow chamber as the treated water leaves the plant prior to flowing into the 15 million litre reservoir. Soda ash is also injected in the outflow chamber once the treatment process is complete, again to raise the pH of the treated water.
- 11 Service Reservoir:** Covered clean water storage container.

CHAPMAN WATER SYSTEM BACKGROUNDER



CONTEXT

The Chapman Water System supplies water to approximately 90% of the population of the Sunshine Coast, including Electoral Areas B (Halfmoon Bay), D (Roberts Creek), E (Elphinstone), F (West Howe Sound), District of Sechelt, and shíshálh Nation. This water system is located on the territory of the shíshálh Nation and Skwxwú7mesh Úxwumixw.

WATER SOURCE

The Chapman Water System has several water sources, including Chapman Creek (fed by Chapman and Edwards Lakes), Gray Creek, and Aquifer 560. The primary year-round water supply source is Chapman Creek, and the two secondary sources are Gray Creek and Aquifer 560 that supply additional water to the system during the summer months when demand is high. Three emergency sources only supply water during emergency situations, the Chapman Lake siphon system, Edwards Lake, and Trout Lake. The Chapman Water System is dependent on precipitation and snowmelt during the year to maintain sufficient water supply in Chapman Creek, and for groundwater recharge of Aquifer 560. Once complete, the Church Road Well Field will become a primary source and draw water from Aquifer 560. The Church Road Well Field Project will connect the Granthams Landing and Soames Point Water Systems to the Chapman Water System.

Chapman Creek

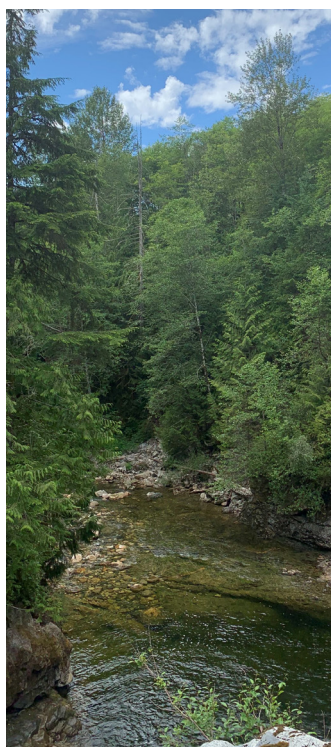
Chapman Creek is 27 kilometers (km) in length, stretching from the headwaters at Chapman Lake in Tetrahedron Provincial Park to the Salish Sea at Mission Point Park in Davis Bay. Chapman Lake is approximately 976 m above sea level, is 34 ha in size and has a storage capacity of 680 million litres (L). The Chapman Creek watershed is approximately 7,150 hectares (ha) in size. Edwards Lake and Gray Creek are in the Gray Creek Watershed, however water from Edwards Lake is diverted into the Chapman Creek watershed to augment Chapman Creek flow during periods of drought and high community water demand.

Water diverted from Chapman Creek flows to the Chapman Water Treatment Plant. After being treated, water is stored in a large reservoir, where it is then gravity fed to other reservoirs and water users.

Low water flows in Chapman Creek during emergency drought conditions are augmented through additional water released from Chapman Lake via a siphon system, and Edwards Lake through a controlled dam and siphon. Water from these emergency sources is only used when Stage 4 Water Conservation Regulations are declared.

Gray Creek

Gray Creek flows from its headwater in Tetrahedron Provincial Park to the Sechelt Inlet north of Naylor Road, between the communities of Sandy Hook and Tuwanek. Water from Gray Creek is chlorinated at the pump station. Gray Creek is a secondary water source that is only used during times of drought and high demand, and requires approval from Vancouver Coastal Health to ensure water quality standards are met.



FAST FACTS

Primary Water Source:
Chapman Creek

Number of Active Connections:
10,600

Total Water Distributed:
4.2 billion litres/year

Aquifer 560

(Chaster Well, Church Road Well Field)

Aquifer 560 is the water source for Chaster Well and the Church Road Well Field. The aquifer extends from the base of Mount Elphinstone to the west, and along the coastline from north of Langdale to the south of Elphinstone.

Trout Lake

Trout Lake is located in Electoral Area B (Halfmoon Bay), along Highway 101. The lake has not been used as a water source for many years, as poor water quality and a low water licensing amount makes this an inefficient drinking water source. Trout Lake infrastructure would require significant improvements before drinking water could be distributed from this source

SUPPLY INFRASTRUCTURE

The Chapman Water System provides potable water to approximately 10,600 active service connections including businesses, industry, farms, and institutions. The water system infrastructure currently consists of one well, nine pump stations, two water treatment facilities, 11 reservoirs, watermains, fire hydrants, and residential water meters in the Electoral Areas. In 2023 infrastructure from the Church Road Well Field will also be included in this system and by 2025, water meters will be installed on all service connections in the Regional Water Service.

Chapman Creek Water Treatment Plant

In 2004, the Chapman Creek Water Treatment Plant was completed. The facility generally processes and distributes an average of 343 million litres of water each month. In 2021, the Chapman Water Treatment Plant produced 4.1 billion litres of drinking water.

Gray Creek Water Treatment Plant

The SCRD is currently looking into the feasibility of upgrading the Gray Creek Water Treatment Plant. A multi-year hydrological study is underway to gather creek flowdata, update watershed modelling, and assess of theviability of the source through a climate change lens. In 2021, Gray Creek produced just over 102 million litres of drinking water, primarily during the summer months.



Church Road Well

Church Road Well Field and water treatment facility will contribute to the Chapman Water System. The well field will use three wells to provide year-round water supply from Aquifer 560.

Chaster Well

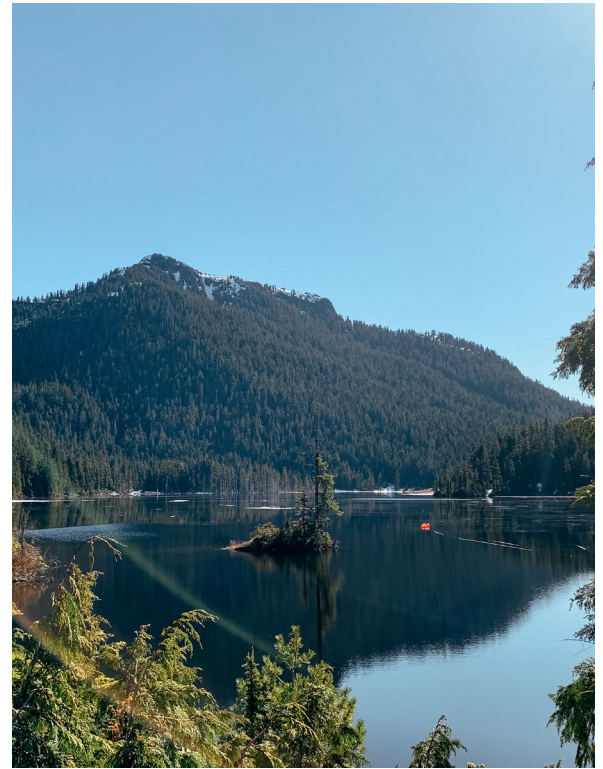
Chaster Well is located near Cedar Grove Elementary School, off Chaster Road and draws water from Aquifer 560. The well and a small chlorination station became operational in 2003 and supplies water during the summer to help meet peak demand. In 2021, Chaster Well produced 79 million litres of treated drinking water.

FUNCTIONALITY

Household water use in the SCRD fluctuates significantly throughout the year. Within the summer months, the current water supply system does not meet community demand. Water Conservation Regulations are in effect from May 1 to September 30 each year, and in recent years, have been escalated to Stage 4, a ban on outdoor water use.

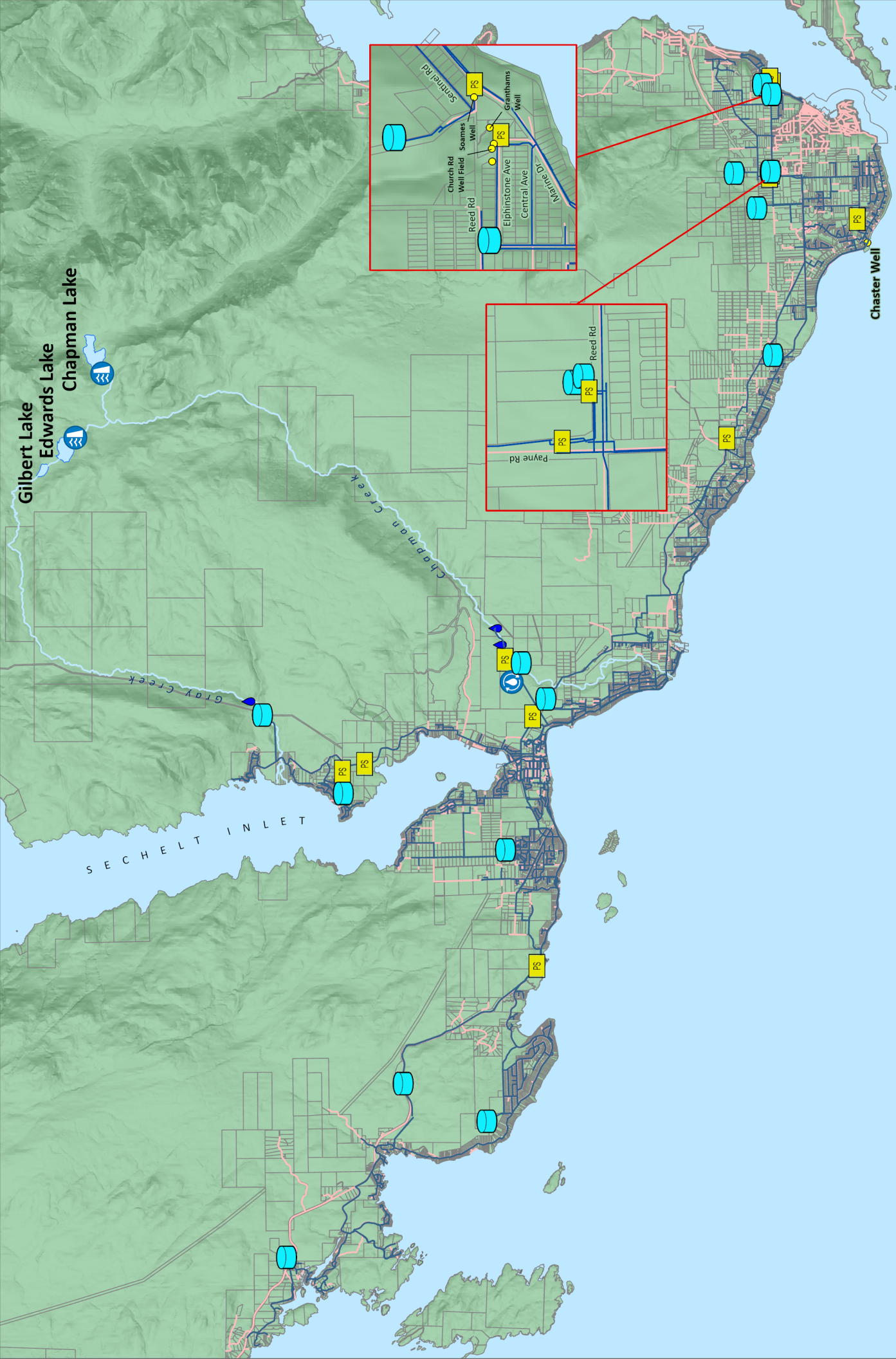
The SCRD is working on numerous water projects that aim to add additional water supply, improve water efficiency and increase resiliency of the current water sources.

To learn more about water supply projects that will continue to increase water supply and better serve local residents and businesses, please visit letstalk.scrd.ca/water



Context Map Chapman





Chapman Water System Infrastructure

