

Coquitlam UV Disinfection Project

WATER TREATMENT PLANT CONSTRUCTION

METRO VANCOUVER, working in cooperation with the City of Coquitlam, has undertaken a major water utility infrastructure project at the Coquitlam watershed to ensure the region will continue to have high-quality drinking water. The existing Coquitlam water treatment facilities have been upgraded and an ultraviolet (UV) light disinfection facility has been added in order to comply with new requirements under Health Canada's Guidelines for Canadian Drinking Water Quality. Construction of the Coquitlam UV Disinfection Facility commenced in spring 2011. This facility has been treating Coquitlam source water since early 2014.

BACKGROUND

Metro Vancouver supplies drinking water for our region. The source is rainwater and snowmelt, which is stored in the Capilano, Seymour and Coquitlam reservoirs. In order to protect water quality, these mountainous watersheds are closed to public access.

The Coquitlam Watershed and its water treatment facilities provide approximately 370 million litres of potable water on an average day, or approximately one third of the total water supply delivered in the Metro Vancouver region.

As part of Metro Vancouver's Drinking Water Treatment Program, the water disinfection process was upgraded in 2000 to include ozonation as the primary disinfectant, in addition to the existing chlorination system. The Coquitlam UV Disinfection Facility complements the existing ozone and chlorination processes by improving primary disinfection.



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BENEFITS OF ULTRAVIOLET LIGHT

Chlorine has been successfully used in drinking water treatment for decades. However, there are chlorine-resistant organisms, such as *Cryptosporidium* and *Giardia*, which are harmful to humans.

Ultraviolet light is highly effective at treating these chlorine-resistant micro-organisms and produces no disinfection by products.

UV light, which is invisible to the human eye, provides rapid, effective inactivation of micro organisms through a physical process.

Ultraviolet light also has the benefit of not altering the taste, colour or odour of water.

ULTRAVIOLET, OZONE AND CHLORINATION DISINFECTION PROCESSES

Water from the Coquitlam Reservoir is pre-treated by the existing ozonation system before it enters the Coquitlam UV Disinfection Facility. Ozone, a form of oxygen, helps remove micro-organisms from the water, improves water quality and reduces disinfection by-products. Ozone also helps to improve water clarity, which increases the efficiency of the subsequent ultraviolet process. The result is less energy use and a smaller sized UV plant.

The water is directed into eight ultraviolet units, each containing 40 ultraviolet lamps encased in protective sleeves. As water flows through the units, ultraviolet light emitted from the lamps passes through the water, inactivating the micro organisms. As a result, drinking water will be safer without additional chemicals being added at the treatment plant. Lastly, chlorine is added as a disinfectant to safeguard the water from bacterial regrowth in the water distribution system.



CONSTRUCTION OVERVIEW

The Coquitlam UV Disinfection Project includes:

- a new ultraviolet disinfection facility
- associated underground valve chambers, which regulate the flow of water through surrounding water mains
- an operations and maintenance centre, which houses a control room, offices, meeting rooms and a water-testing laboratory
- upgrades to the existing ozonation facility.

Construction activities for the new facility were confined within the Coquitlam Watershed, with minimal impact to nearby residents. Activities associated with the project include:

- tree removal
- excavation and soil relocation
- equipment and material delivery
- building construction and pipe installation
- restoration and habitat enhancement.

ENVIRONMENTAL STEWARDSHIP

Environmental stewardship is a critical part of Metro Vancouver's mandate. Careful design and construction planning minimized environmental impacts.

Working in conjunction with a number of approval agencies including Fisheries and Oceans Canada (DFO), enhanced salmon rearing habitat was constructed at the end of the project. In addition, an environmental impact assessment was conducted. Recommendations that were implemented include preconstruction wildlife surveys and the salvage and relocation of small animals and fish. Tree removal has been minimized by utilizing existing cleared areas within the watershed. Top soil, woody debris and portions of the excavation soils were reused on-site whenever possible and all construction areas were restored at the end of the project.



SUSTAINABLE BUILDING DESIGN

The Coquitlam UV Disinfection Facility was designed with numerous sustainable features and is targeting a Leadership in Energy and Environmental Design (LEED) Silver classification.

Some of the sustainable features include green roofs, enhanced salmon habitat creation, incorporating indigenous plants in the landscaping and using permeable pavement to mimic the water retention of natural soil.

Additional sustainable features include a hydronic heating system which utilizes water to heat or cool the building as opposed to conventional heating, EcoSmart concrete which reduces carbon dioxide (CO₂) emissions, installation of electrical vehicle charging stations and the use of recycled building materials. In addition, the selected ultraviolet technology will reduce energy consumption by approximately 30 per cent relative to conventional systems.

METRO VANCOUVER'S ROLE IN WATER SUPPLY

Metro Vancouver provides a reliable source of safe, high-quality drinking water to its customers at a reasonable cost. This includes acquiring and maintaining supply, as well as treating, testing and delivering water to the municipalities. In turn, the municipalities are responsible for conveying water to residents and businesses.

Metro Vancouver uses a system of watersheds, dams, treatment facilities, reservoirs, pump stations and water mains. To maintain the quality and reliability of these systems and of the supply, improvements are constantly underway.

CONTACT INFORMATION

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