

January 8, 2018



**TO:** Park Board Chair and Commissioners  
**FROM:** General Manager - Vancouver Board of Parks and Recreation  
**SUBJECT:** Metro Vancouver Stanley Park Water Supply Tunnel - Public Engagement & Next Steps

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## RECOMMENDATION

THAT the Vancouver Park Board authorize Metro Vancouver to proceed with the design of the proposed Stanley Park Water Supply Tunnel, including geotechnical drilling and detailed studies required for the new regional facility.

## BOARD AUTHORITY

As per the [Vancouver Charter](#), the Park Board has exclusive jurisdiction and control over park land use in the City of Vancouver, including any structures, programs and activities, fees, and improvements that occur within designated parks.

## BACKGROUND

At the Park Board In Camera meeting held on June 20, 2017, the Board granted permission for Metro Vancouver to initiate public engagement in relation to the proposed Capilano Water Main No. 5 (Stanley Park Section), hereafter referred to as the Stanley Park Water Supply Tunnel, and requested staff to report back on the findings of the public engagement and technical studies. The Board also directed that the Park Board General Manager initiate discussions with the City of Vancouver's Director of Legal Services and the Greater Vancouver Water District (GVWD) Commissioner about a Capilano Water Main Agreement, and with Parks Canada about the Federal approval processes required for the project.

Constructed in the 1930's, the existing Metro Vancouver water main within Stanley Park, named Capilano Main No.4, delivers water from the Seymour-Capilano Filtration Plant in the District of North Vancouver to the residents and businesses within Vancouver, Musqueam First Nation (through City of Vancouver water mains), Richmond, Delta, and Tsawwassen First Nation, as shown in Appendix A.

The water main has operated effectively over the past 85 years, with only minor leaks recorded; however, a section of this 1.8m diameter steel water main experienced a major leak adjacent to Lost Lagoon in August 2016. Pipe condition assessments performed at this time indicate the water main is reaching the end of its serviceable lifespan and is in need of replacement.

In order to increase system resilience and to add capacity to accommodate long term population growth, Metro Vancouver is in the early stages of planning for the project known as the Stanley Park Water Supply Tunnel, which includes tunneling deep underground to build a new larger diameter water main and two underground valve chambers.

This report summarizes the results of the public engagement and recommends that Metro Vancouver continue with the work required to complete the design of the new water supply tunnel.

## DISCUSSION

In the early stages of the project, Metro Vancouver identified a number of options to replace the existing water main, which included both cut and cover and trenchless installation (i.e. tunneling) options. Metro Vancouver worked closely with Park Board and City of Vancouver staff in the refinement of these alignment options and in late 2016, Metro Vancouver initiated preliminary geotechnical, environmental, archaeological, trenchless technology and traffic studies for the project.

In addition to constructability, operational requirements, and financial costs, key considerations for a project of this magnitude in Stanley Park include:

- Protecting First Nations cultural resources in the park;
- Limiting impacts to the natural environment, especially wildlife habitat and trees;
- Maintaining access to the park for pedestrians, cyclists and vehicles;
- Protecting built features, infrastructure and public amenities in the park; and
- Minimizing construction duration and impacts on park users, partners, events, and operations.

Based on this preliminary analysis and discussions with Park Board staff, the following items are highlighted:

- Any cut and cover construction through the historical entrance to the south end of the park is not viable. This confirms the water main must be installed underneath Lost Lagoon, which is only possible using trenchless technology.
- Any cut and cover construction through the northern section of the park will have high archaeological impact potential, high traffic impacts, and will result in the loss of a significant number of valuable trees (more than 125). Therefore, a cut and cover methodology is not recommended in the north section of the park.
- Archaeological and public impact studies identified that effects to residents, park users, park businesses, and First Nations sensitive areas are vastly reduced by utilizing a construction shaft in the middle of the park when evaluating a completely trenchless installation option.

As a result of the collaborative staff analysis and early feedback from the Musqueam, Squamish and Tsleil-Waututh First Nations, the preferred conceptual route option for the proposed project is a tunneled installation with a central construction shaft in the middle of the park, proposed to be located within the Stanley Park Service Yard and two exit shafts at the north and south ends of the park, proposed near the Burrard Inlet, off Tunnel Trail and at the intersection of Chilco and Alberni Streets, as shown in Appendix B.

The proposed project consists of a 1.4km long, 2.6m diameter water main to replace Capilano Main No. 4 between the south shore of Burrard Inlet and the intersection of Chilco and Alberni Streets. The conceptual design of the tunnel proposes installation within a stable bedrock

layer deep below Stanley Park and Lost Lagoon, with tunnel shafts ranging from 35m to 50m deep, as illustrated in Appendix C. The area around the central construction access shaft shall host the majority of the surface impacts of the project, with the tunneling and installation work constructed from a large shaft (12m to 15m in diameter) plus a large construction lay down area.

The exit shafts at each end of the project will consist of smaller diameter construction shafts (3m to 4m in diameter), with smaller construction lay down areas. Installation of underground valve chambers will also take place adjacent to the existing valve chambers at each end of the project. Lastly, the project involves replacing the existing water distribution connection for Stanley Park, which is currently located on Pipeline Road at the intersection with Tunnel Trail.

Based on early design work completed to date, the construction for this proposed project will take approximately three to four years, commencing in 2021, subject to Board approval. The duration of the impacts at Burrard Inlet and Chilco Street valve chambers shall be reduced as work will be restricted to the construction shaft in the middle of the park for a significant portion of the first two years of the project.

While further design work is taking place on the new Stanley Park Water Supply Tunnel, Metro Vancouver is planning maintenance work on the existing Capilano Main No. 4 to ensure that the water main will remain in operation while the new water supply tunnel is being constructed. This work involves the installation of a corrosion protection system on the section of the existing water main located near Lost Lagoon.

### **Impact Analysis and Mitigation Proposals**

A trenchless option through the park will mitigate many of the potential impacts from this project. However, construction of this new water supply tunnel will result in some impacts to the park such as:

- Tree removals and potential archaeological impacts at the exit shaft near Burrard Inlet;
- Temporary closure of Tunnel Trail;
- Temporary re-routing of the cycling/pedestrian path adjacent to the exit shaft near Chilco and Alberni Streets;
- Increased truck traffic on Pipeline Road during construction;
- Potential impacts to the previously disturbed vegetated area north of the Stanley Park Service Yard parking lot, located in the middle of the park; and
- Noise, dust, and vibrations from construction activities.

Upon completion of further studies and confirmation of the final route alignment through the park, the actual impacts will be identified and appropriate mitigation measures will be developed. At a minimum, mitigation measures will include:

- Minimizing work space at the tunnel exit shaft to limit tree loss;
- Archaeological monitoring of construction activities;
- Minimizing truck traffic during periods of peak usage;

- Rehabilitation and replanting of disturbed areas of the park;
- Mitigating noise, dust and other construction impacts; and
- Environmental restoration projects.

Once all project impacts to the park and park users have been determined, Metro Vancouver in consultation with Park Board staff will develop a detailed project impact mitigation plan. Park Board and Metro Vancouver staff will also continue reviewing opportunities for collaboration on environmental enhancements related to this project in Stanley Park, including a possible focus on Lost Lagoon.

## **COMMUNITY ENGAGEMENT**

### **Overview**

Metro Vancouver is committed to engaging communities in the planning and construction of its large infrastructure projects. The objective of engagement during this conceptual design stage was to introduce the project and to identify potential impacts, community values, and interests for the project team to consider as part of project planning. Public engagement on this phase of the project took place between September and November 2017. Additional engagement is planned for the detailed design phase of the project in 2019 and prior to the start of construction in 2021.

In coordination with Park Board staff, Metro Vancouver staff organized a number of in-person meetings with stakeholders including businesses and organizations that operate within close proximity to the proposed construction sites or with interests in the Park, such as tour operators.

Meetings and correspondence have occurred with the Stanley Park Service Yard, Stanley Park Ecology Society, Stanley Park Horse Drawn Tours, Stanley Park Miniature Train, Vancouver Police Department Mounted Unit, West End Business Improvement Association, and HUB: Your Cycling Connection.

Metro Vancouver staff organized three “pop up” public information sessions on the Stanley Park seawall and at the proposed Chilco Street exit shaft to inform park users about the project. In addition, a well-attended public open house for the general public and local area residents was held on October 5, 2017, at the proposed Chilco Street exit shaft site near Lost Lagoon. Approximately 130 people attended the event that was held from 4:00pm to 8:00pm.

The open house was broadly advertised, given the potential for regional interest in this major infrastructure project and its location within the iconic Stanley Park. Ads were placed in the Vancouver Sun and Westender newspapers, and a fact sheet was delivered by Canada Post to over 16,000 residents, businesses, and civic centres in the West End and Downtown areas. Signage was installed at multiple locations throughout Stanley Park and a regional social media campaign reached 21,000 people via sponsored Facebook ads and Metro Vancouver’s social media channels.

### **Summary of Community Feedback**

Several community Open House attendees expressed appreciation for the format of the event and the knowledgeable staff. According to the feedback forms, nearly 80% of respondents

felt that they were provided with a very or mostly appropriate level of information about the project at the Open House.

Key themes emerging from the community engagement process included general support for the proposed project and preferred construction methodology, and specific requests as follows:

***Protect Park Ecology***

Engagement participants stated they would like to see Metro Vancouver preserve the well-being of the park's ecology during the construction of the Water Supply Tunnel. Several attendees noted that Metro Vancouver should work in partnership with the Stanley Park Ecology Society and Park Board to preserve the trees and wildlife in the park over the course of the project. Stanley Park Ecology Society offered to contribute their studies and collaborate on mapping and identifying significant wildlife species during the project planning process. Metro Vancouver has stated their willingness to do so.

***Minimize Park Operation Impacts***

Park Board staff and the Metro Vancouver project team discussed the location planned for the Central Shaft, and its potential impact on the park's operations. This area contains revenue parking, storage for Park Board partners, and plans for a composting facility. The location and extent of the Central Shaft will be finalized in consultation with the Park Board to minimize impact to park's operations.

The Park Board's partners and contractors (the parking lot, horses, buses, transit, and staff) make significant use of Pipeline Road. Meeting attendees inquired about the quantity and frequency of dump trucks transporting excavation material along Pipeline Road during construction, and the traffic impact that this could have on Park Board partners. Timing of truck movements will be reviewed to minimize park impacts during peak activity schedules, such as during train events and summer programs at Theatre Under the Stars.

***Minimize Impacts on Residents including Pedestrians and Cyclists***

Open House attendees enquired about the construction impacts on the road leading to the Burrard Shaft site, cycle and running routes south of Lost Lagoon, and the washrooms and community garden near the Chilco Shaft site. A meeting with HUB Cycling revealed that Pipeline Road is currently an unofficial bike route used to cut across the park from the Seawall. It was suggested that during construction, routes for cyclists should be sufficiently wide and clearly demarcated from pedestrian paths with appropriate signage.

**FIRST NATIONS ENGAGEMENT**

**Overview**

Metro Vancouver staff met with the Musqueam, Squamish, and Tsleil-Waututh First Nations to share project plans, to obtain feedback, to identify the preferred ongoing approach to engagement, and to obtain support for the project. Metro Vancouver staff also attended a Stanley Park Intergovernmental Working Group meeting to introduce the project to the Musqueam, Squamish, and Tsleil-Waututh. Park Board staff also attended these meetings.

Early discussions via the Working Group revealed that each First Nation preferred to be engaged independently about the project. In addition to project information sharing meetings, Metro Vancouver project staff have also conducted site visits to Stanley Park, where staff and members from each individual First Nation were able to explore the sites within the park that were to receive the highest level of disturbance, including the central construction shaft and the two exit shafts.

### **Summary of First Nations Feedback**

The feedback received was overall positive and it was generally agreed that the conceptual route option and proposed construction methodology offered the least overall impact to the park. Key themes emerging from the Musqueam, Squamish, and Tsleil-Waututh Nations include requests that Metro Vancouver:

- Minimize impacts to the previously disturbed areas of the Park;
- Limit tree loss;
- Increase cultural awareness and sensitivity of all personnel working on the project through training delivered by the Nations;
- Develop a protocol to manage the discovery of ancestral human remains; and
- Utilize First Nation monitors during the investigative geotechnical drilling and shaft construction work.

After receiving this feedback, Metro Vancouver staff met with the Stanley Park Intergovernmental Working Group at a regularly scheduled meeting organized by Park Board staff on September 29, 2017. At this meeting, Metro Vancouver staff presented a summary of the feedback received to date from Musqueam, Squamish, and Tsleil-Waututh First Nations to ensure that their feedback has been collected prior to proceeding with further studies. Based on the outcome of the meeting, it was indicated by Park Board staff that no further concerns were raised at this time.

### **LEGAL AGREEMENT**

As previously reported, a legal Agreement with Greater Vancouver Water District (GVWD) will be necessary to outline terms and conditions for the temporary working area for construction, the duration of the installation, and the ongoing maintenance of the Stanley Park Water Supply Tunnel to be constructed in Stanley Park. The General Manager and his designates have initiated discussions with the City's Director of Legal Services and the GVWD's Commissioner about the terms and conditions necessary for this project to ensure the Park Board's interests are protected.

Furthermore, as the affected areas of Stanley Park are the subject of a lease granted by the Federal Government to the City of Vancouver, approvals from the Federal Government for new infrastructure are required. The General Manager's designates have initiated discussions and will continue to work to obtain approvals for this project with Parks Canada.

### **NEXT STEPS**

In early 2018, Metro Vancouver plans to hire a consultant to assist with further design on the Stanley Park Water Supply Tunnel. The next step in the design process is to conduct a detailed geotechnical investigation, which will include drilling a number of deep boreholes

required to detail the underlying geotechnical conditions. In addition, further detailed environmental, archaeological, seismic and traffic impact studies are planned which will assist in determining impacts of the project on the Park and Park users. The information collected will help determine the appropriate measures to mitigate construction impacts. Parks Canada approval is required for these investigations.

It is anticipated that these studies will conclude in late 2020, after which staff will report back to the Board summarizing the studies and associated mitigation measures and, subject to Parks Canada approval having been obtained, to seek approval from the Board to allow Metro Vancouver to commence construction on the project.

## SUMMARY

Constructed in the 1930's, the Stanley Park Section of Capilano Main No. 4, between the south shore of Burrard Inlet and the intersection of Chilco and Alberni Streets, is in need of replacement. This water main provides clean, safe drinking water to the majority of Vancouver and Richmond, parts of Delta, and the Tsawwassen First Nation.

The conceptual alignment and a trenchless installation for the proposed Stanley Park Water Supply Tunnel have been identified. Engagement with the Musqueam, Squamish and Tsleil-Waututh Nations as well as the public regarding this project has been undertaken and will continue during the subsequent phases of design. Feedback to date has been positive with the majority of the stakeholders support the proposed project and preferred construction methodology. The Musqueam, Squamish, and Tsleil-Waututh Nations have provided valuable insights and their requests for project sensitivities and training will be incorporated.

Subject to approval from the Board, Metro Vancouver proposes to proceed with further design work. Upon completion of the detail design, staff will report back to the Board and will request approval to construct the new water supply tunnel. Park Board staff will continue discussions with the City of Vancouver Director of Legal Services and the GVWD Commissioner Officer about the Stanley Park Water Supply Tunnel Agreement. Furthermore, the Park Board General Manager's designates will continue discussions with the Federal Government (Parks Canada) about the approval process required for this major infrastructure project in Stanley Park.

This project aligns with the Park Board and Metro Vancouver's Strategic Plans and will benefit the park, residents and businesses alike for strategic asset management. Metro Vancouver's Drinking Water Management Plan includes the provision of clean, safe, and reliable supply of drinking water to the region and to proactively replace and upgrade infrastructure to meet the needs of residents and businesses of the Lower Mainland. Metro Vancouver will plan and deliver the Stanley Park Water Supply Tunnel in a sustainable manner in collaboration with the Musquem, Squamish and Tsleil-Waututh Nations and Park Board staff, and seek opportunities to enhance the environment in Stanley Park in the process.

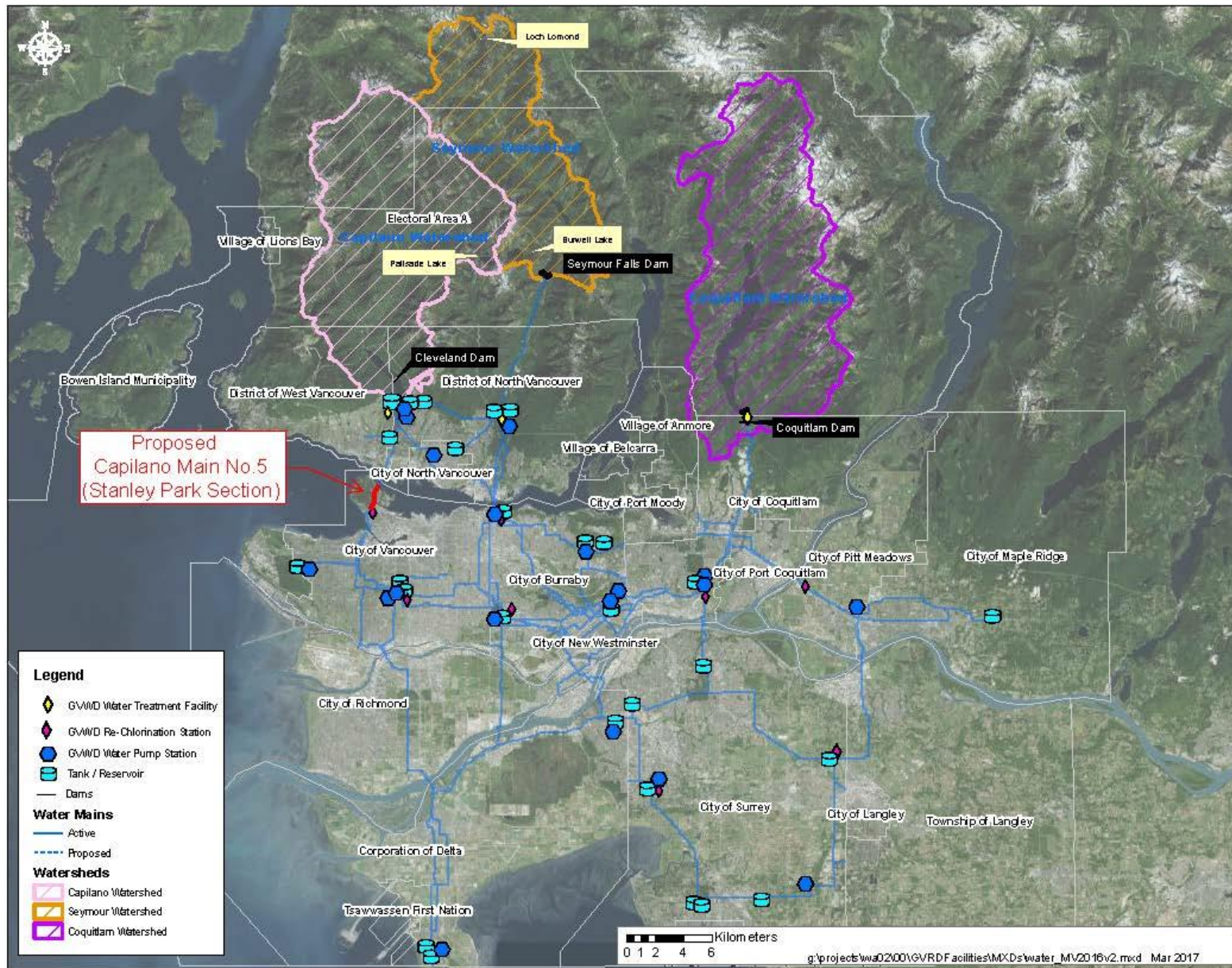
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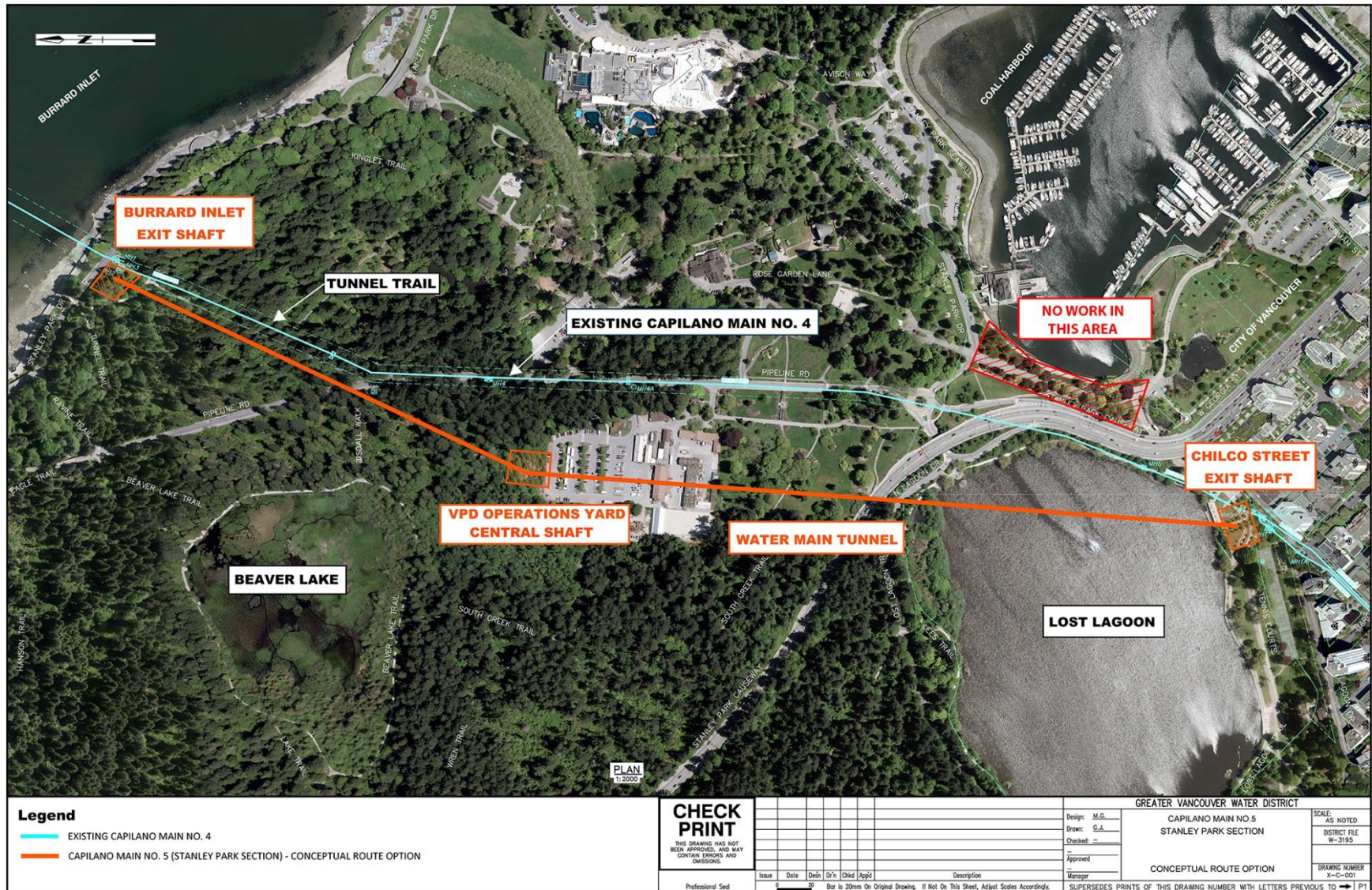


Capilano Main No.4 Water Delivery - Aerial Map





Stanley Park Water Supply Tunnel - Conceptual Design Alignment



**Legend**  
 — EXISTING CAPILANO MAIN NO. 4  
 — CAPILANO MAIN NO. 5 (STANLEY PARK SECTION) - CONCEPTUAL ROUTE OPTION

**CHECK PRINT**  
 THIS DRAWING HAS NOT BEEN APPROVED AND MAY CONTAIN ERRORS AND OMISSIONS.

Issue	Date	Drawn	Dr'n	Chkd	App'd	Description

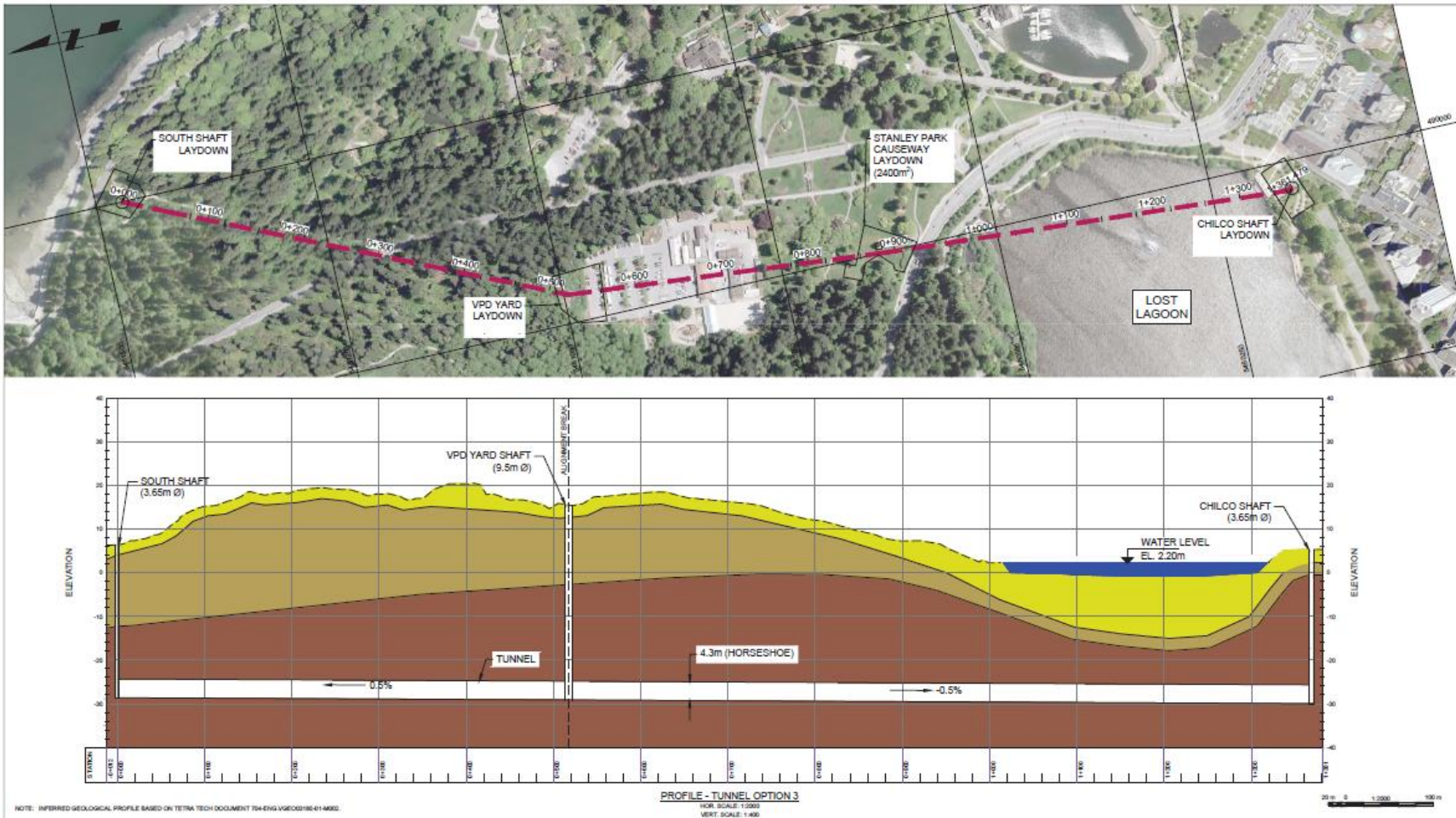
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 Approved: —  
 Manager: —

GREATER VANCOUVER WATER DISTRICT  
 CAPILANO MAIN NO. 5  
 STANLEY PARK SECTION  
 CONCEPTUAL ROUTE OPTION

SCALE: AS NOTED  
 DISTRICT FILE W-3195  
 DRAWING NUMBER X-C-001  
 SUPERSEDES PRINTS OF THIS DRAWING NUMBER WITH LETTERS PREVIOUS TO — P1



Stanley Park Water Supply Tunnel - Conceptual Design Geotechnical Profile



## Stanley Park Water Supply Tunnel - Planning Process Timeline

# PLANNING PROCESS TIMELINE

