Fraser Valley Regional District

STAFF REPORT

To: Electoral Area Services Committee **Date:** 2025-09-04

From: Tracey Heron, Planner I

Subject: FVRD Electoral Area A and B – Geohazard Mapping Project

Reviewed by: Katelyn Hipwell, Manager of Planning
Graham Daneluz, Director of Planning & Development
Jennifer Kinneman, Chief Administrative Officer

RECOMMENDATION

This report is being brought forward for the Board's information and there is no staff recommendation.

BACKGROUND

During the initial development or update of an Official Community Plan (OCP), local governments are required by section 473 of the Local Government Act (LGA) to include statements and map designations respecting the restriction of the use of land subject to hazardous conditions. To comply with this requirement, the FVRD engaged BGC Engineering Inc. (BGC) to update the available geohazard mapping in the Fraser Canyon as a precursor to the update of the Fraser Canyon OCPs.

In the existing OCPs, development permit areas for the Fraser Canyon were established from geohazard reports commissioned at the time of OCP development. The two (2) OCPs that cover the Fraser Canyon are *Official Community Plan for Boston Bar – North Bend – Canyon Alpine, Regional District of Fraser-Cheam Bylaw No. 804, 1993,* and *Fraser Valley Regional District Official Community Plan for Portions of Electoral Area "B", Yale, Emory Creek, Dogwood Valley and Choate, Bylaw No. 0150, 1997.*

DISCUSSION

Since the adoption of the Fraser Canyon OCPs in 1993 and 1997, numerous geohazard events have occurred in the Fraser Canyon, as well as technological advancements for the assessment of geohazards.

In the fall of 2023, comprehensive LiDAR data was collected along the Fraser Canyon. This was part of a larger initiative by the Province of BC to collect LiDAR data for the entire province. Remote sensing technology allows for 3-dimensional mapping, which in turn, can be interpreted to identify potentially hazardous areas. LiDAR data was essential to the Fraser Canyon geohazard mapping project report, dated June 18, 2025, and the project covered the areas of Dogwood Valley, Yale, and Spuzzum in Electoral Area B, and Boston Bar, North Bend, and Canyon Alpine in Electoral Area A. The report provides updated geohazard mapping for 53 alluvial fans and 73 landslides within the assessed area, which covers a total of 361 properties.

Limitations of Previous Reporting

The updated Fraser Canyon geohazard mapping provides data that was previously not available. The following are limitations of previous reporting:

Geohazard activity – While geohazards have occurred throughout the years in the Fraser Canyon, not all events have been recorded. This mapping project took both the older, and more recent geohazard events into consideration, including the numerous atmospheric river events of November 2021.

Areas of high risk – Lack of previous reporting created uncertainty of hazard frequency or of a hazard having mixed processes. The new mapping demonstrates where detailed site-specific assessment is required.

Previous geohazard assessment – EGBC assessment requirements have changed over the years, and past assessments by qualified professionals may not have accounted for:

- Watershed disturbances, such as logging, pest infestations, and wildfires;
- Climate change impacts, such as increased rainfall, and freeze-thaw cycles; and
- Cascading hazards, such as a landslide damming a river, with a subsequent outburst flood.

Methodology

BGC's general approach to identifying the geohazards in the Fraser Canyon study area consisted of:

- Compiling available overview and property-specific reports and LiDAR data;
- Creating an inventory of recorded geohazards;
- Creating maps of alluvial fans and landslides, including rockfall, for the study areas;
- Conducting field work to assess site conditions, and verify the interpreted geohazard process types; and
- Assigning the dominant geohazard type to each mapped feature.

Primary Uses of the Report

The Fraser Canyon geohazard mapping project is intended to be used primarily for planning purposes to identify potentially hazardous areas subject to FVRD's Hazard Acceptability Thresholds for Development Approvals document, dated 2020. The following are primary uses of the report:

Land use planning

- Identify areas within the Fraser Canyon with potential geohazard risks, such as alluvial fans, or landslides, across 361 mapped private properties;
- Determine development permit areas; and
- Supports zoning and community planning decisions.

Development approvals

- Determine if property-specific geohazard assessments are required prior to development.

Risk Management

- Identify high-risk areas, and prioritize areas requiring more detailed geohazard assessments; and
- Supports policy development and hazard mitigation strategies.

Public Information

- Hazard information, through the mapping of images, will be made available for public access through the FVRD Web Map.

Report Recommendations

The Fraser Canyon Mapping Project report outlines recommendations for both FVRD, and qualified professionals when considering geohazard risk management and policy development, risk-reduction measures, and individual property assessments, including:

- *Consider Vulnerability of Temporary Structures* - Generally, due to the lighter-weight construction materials of temporary housing structures, such as recreational vehicles and trailers, they are more prone to impacts from fast-flowing water and/or rock impacts
- *Identifies High-Risk Creeks that may benefit from detailed assessments* - Detailed hydraulic and debris-flow runout modeling on specified creeks.
- *Boston Bar Landslide Complex Assessment* - Detailed assessment of potentially catastrophic landslide.
- *LiDAR imagery for Yale* - Update the current mapping of Yale using LiDAR technology.
- *Sub-delineate Hazard Zones by Likelihood* - Further assessment could refine hazard likelihood within mapped areas, thus improving planning and potentially reducing the need for detailed assessments.
- *Use LiDAR mapping extents as credible boundaries*
- *Local Site Assessments* – Terrain, geology, and groundwater should be assessed to determine the likelihood of hazards reaching the mapped extents.
- *Follow EGBC Guidelines* – Site-specific assessments must comply with EGBC requirements.

Benefits for Property Owners

The Fraser Canyon geohazard mapping project covers 361 private properties. The updated mapping provides a reliable extent of alluvial fan, rockfall, and debris slide hazards in relation to these properties. Areas that are currently outside of an OCP area, having limited mapping data, will now have hazard mapping available. This information is also valuable for properties within an OCP area, but outside of previously considered, or undefined[1] alluvial fan hazard areas.

Appendix A demonstrates the currently available mapping for alluvial fan hazards in Dogwood Valley on the FVRD Web Map, compared to the updated mapping information for alluvial fan hazards in the same area. The pink-hatched triangles in the left image demonstrate a lack of information to determine if the properties within the general area of the triangles are subject to alluvial fan hazards. Existing mapping would require geohazard reports from these nine properties due to a lack of mapping information, while the new updated mapping provides more accurate information pertaining to which properties are subject to alluvial fan hazards and where site-specific reports are no longer necessary.

Mail-out Notification

Notification via direct mail-out will be provided to property owners within the study area with information on how to access the report. Staff will also provide notice to the following stakeholders, who have an interest in the study area:

- Boothroyd Indian Band
- Boston Bar First Nations
- Nlka'pamux Nation Tribal Council
- Spuzzum Nation
- Yale First Nation
- Boston Bar Fire Hall
- Yale Fire Hall
- Boston Bar Health Centre
- Boston Bar Library
- Yale Library
- North Bend Community Centre
- Joan Blakeborough Museum and Community Centre

Implementation and Interim Use of the Report

A review and update of the Area A and B Official Community Plans is identified on the EA Planning 2025/2026 work plan. During this process, development permit areas will be updated to reflect the 73 landslides noted in the Fraser Canyon mapping project. Pending an OCP update, FVRD staff will work to produce an interim mapping product on the FVRD Web Map that will reflect the extent of the 53

[1] An undefined area is a known alluvial fan hazard area that has not had its boundaries mapped. The boundary extent is therefore unknown.

alluvial fan hazards, and the Fraser Canyon geohazard mapping project report will be made available in the FVRD geohazard library. This will provide effective interim use of the report for staff and public use.

Full implementation of the Fraser Canyon report will include:

Community Planning

- Integration of the report outcomes into the Fraser Canyon OCP update
- Align geohazard development permit areas with the report mapping during the Fraser Canyon OCP update process
- Update the alluvial fan hazard area mapping within the FVRD Floodplain Management Bylaw No. 1669, 2022

Risk Management

- Further geohazard assessment will be considered as part of the Fraser Canyon OCP update
- Section 56 reports[2] called for, if required

Public Information

- Residential engagement and public consultation will occur during the updating of the Fraser Canyon OCP

COST

The cost of the report by BGC Engineering Inc. was $60,000 (plus GST), and notification to the public and stakeholders will be approximately $465.00.

CONCLUSION

The Fraser Canyon geohazard mapping report, dated June 18, 2025, provides updated geohazard mapping for six (6) communities within Electoral Areas A and B in the Fraser Canyon, and includes 361 private properties. Included are updated geohazard mapping for 53 alluvial fans and 73 landslides within the assessed area.

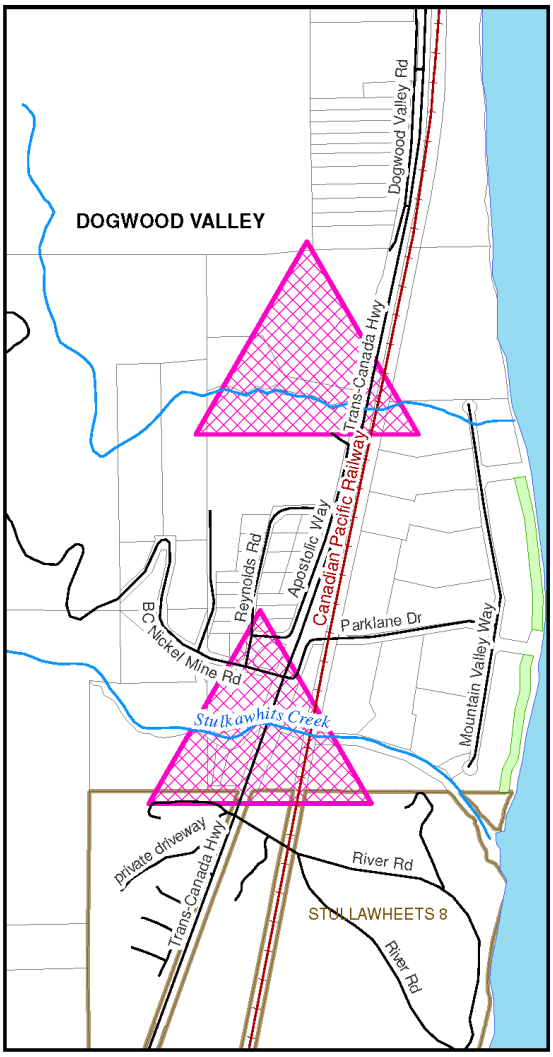
Interim use of this report will include the updating of alluvial fan hazard mapping for FVRD staff and public use on the FVRD Web Map, and access to the full report will be available through the FVRD geohazard library. The property owners within the study area will be made aware of the report location on the FVRD website, as will the key stakeholders within the Fraser Canyon region.

[2] Per Section 56 of the *Community Charter*, a building inspector may call for a site-specific geohazard report if they consider proposed construction on the land may be subject to geohazards. This geohazard report, certified by a qualified professional, must show that the land may be used safely for the use intended if the land is used in accordance with the conditions specified in the professional's report.

Implementation of the Fraser Canyon geohazard mapping report will include updating the mapping in the FVRD Floodplain Management bylaw, and the full extent of the report results will be implemented during the Fraser Canyon OCP update. This process will support responsible land use planning, risk management, and will include engagement and public consultation.

APPENDIX A
Mapping comparison of alluvial fan hazards in Dogwood Valley

Original Hazard Data



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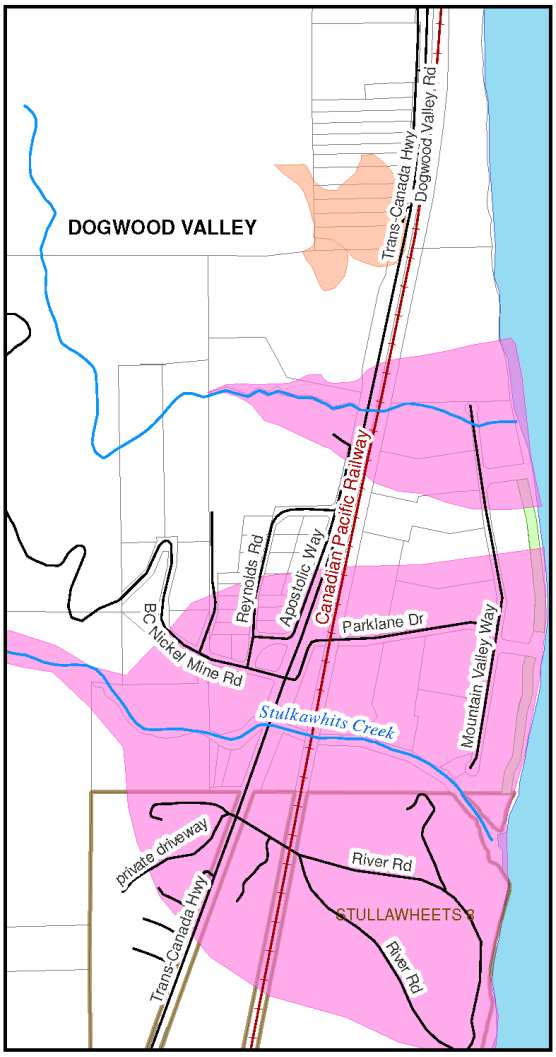
Updated Hazard Data



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Meters
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Alluvial Fans | Debris Flood | First Nations | Properties | Parks
Debris Flow
Paleofan

Map produced by the FVRD GIS Dept. Aug 2025.
For Information Purposes Only.
Original Hazard data courtesy of the BC Ministry of Environment
New Hazard data courtesy of BGC Engineering

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