

**General Notes**

1. Please refer to the **Disclaimer** further below.
2. Please review the associated project reports before using the floodplain maps:  
Northwest Hydraulic Consultants Ltd. (NHC). 2020. 'Okanagan Mainstem Floodplain Mapping Project'. Report prepared for the Okanagan Basin Water Board (OBWB). 31 March 2020. NHC project number 3004430.  
Northwest Hydraulic Consultants Ltd. (NHC). 2021. 'Okanagan Mainstem Floodplain Mapping Project - Development of CGVD1928 Floodplain Mapping'. Letter report prepared for the Okanagan Basin Water Board (OBWB). 30 March 2021. NHC project number 3006034.
3. This map delineates Flood Construction Level (FCL) extents under the design flood event. Mapping of the Okanagan River, Skaha Lake, Vaseux Lake, Ellison Lake, and Osoyoos Lake is based on the 200-year mid-century (2041-2070) design event. Mapping of Okanagan Lake and Wood / Kalamalka lakes is based on the flood of record (2017) adjusted to mid-century for climate change. Tributaries are not included in mapping.
4. The mapped FCL includes a freeboard allowance of 0.6 m added to the calculated flood water level. It has been added to account for local variations in water level and uncertainty in the design event estimates.
5. The FCL shown on all lake maps include an allowance for wind setup (except Ellison) and wave runoff based on co-occurrence of a seasonal 200-year wind event. The wind and wave effects extend 40 m shoreward to delineate the expected limit of wave effects. Beyond this limit the FCL is based on inundation of the flood event without wave effects. **Shoreline FCLs take precedence over lake inundation FCLs. Wave effects have been calculated based on generalized shoreline profile and roughness for each shoreline reach. Site specific runoff analysis by a Qualified Professional may be warranted to refine the generalized wave effects should the shoreline slope be significantly different than those summarized in the project report. The site specific analysis could increase or decrease the FCL by as much as a metre.**
6. Underlying hydraulic analysis assumes channel and shoreline geometry is stationary. Erosion, deposition, degradation, and aggradation are expected to occur and may alter actual observed flood levels and extents. Obstructions, such as log-jams, local storm water inflows or blockages or other land drainage, groundwater, or tributary flows may cause flood levels to exceed those indicated on the maps.
7. The Okanagan floodplain is subject to persistent ponding due to poor drainage. Persistent ponding is not covered by the flood inundation mapping.
8. The majority of the Okanagan River is diked; breaching of the dike was not modelled. Isolated areas below the FCL (as projected perpendicular to flow from the channel), such as those landward of the dikes, are mapped as inundated. This delineation accounts for potential failure and breaching of the dike, seepage through, or inflows trapped behind the separating dike or embankment. This approach is consistent with British Columbia floodplain mapping guidelines.
9. Filtering was used to remove isolated areas smaller than 100 m<sup>2</sup>. Holes in the inundation extent with areas less than 100 m<sup>2</sup> were also removed. Isolated areas larger than 100 m<sup>2</sup> were retained for mapping if they were within 40 metres of direct inundation or within 40 metres of other retained polygons.
10. Okanagan Dam breach and dam overtopping were not modelled. On the right bank of the Okanagan River from the Okanagan Dam downstream to the Highway 97 bridge, inundation mapping is based on modelling of design lake level overflowing to the river downstream; along the left bank downstream of Okanagan Dam inundation mapping is based on river modelling, as Okanagan Lake level overtopping along the left bank is limited to a localized area adjacent to the dam. Overflow at this site was not simulated.
11. Flood modelling and mapping is based on a digital elevation model (DEM) with the following coordinate system and datum specifications: Universal Transverse Mercator Zone 11-N (UTM Zone 11-N), North American Datum 1983 Canadian Spatial Reference System epoch 2002.0 (NAD83 CSRS (2002.0)), Canadian Geodetic Vertical Datum 2013 (CGVD2013), Canadian Gravimetric Geoid model of 2013 (CGG2013). FCL values are presented on the maps in both CGVD2013 and CGVD1928 vertical datums. CGVD1928 values are based on the following specifications: NAD83 CSRS (2002.0), CGVD1928, Height Transformation version 2.0 epoch 1997 (HTv2.0 (1997)).
12. The accuracy of simulated flood levels is limited by the reliability and extent of water level, flow, and climate data. The accuracy of the floodplain extents is limited by the accuracy of the design flood flow, the hydraulic model, and the digital surface representation of local topography, which is bare-earth (no buildings or structures). Localized areas above or below the FCL may be generalized by the inundation mapping. Therefore, floodplain maps should be considered an administrative tool that indicates flood elevations and floodplain boundaries for a designated flood. A Qualified Professional is to be consulted for site-specific engineering analysis.
13. Industry best practices were followed to generate the floodplain maps. However, actual flood levels and extents may vary from those shown. Residual flood risk beyond that mapped exists for flood events more extreme than the design events. OBWB and NHC do not assume any liability for variations of flood levels and extents from that shown.



**Data Sources**

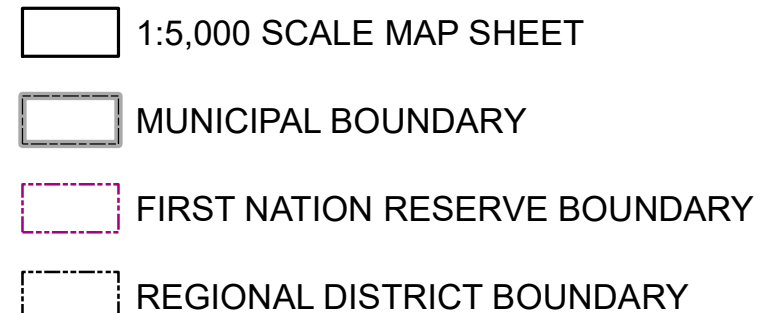
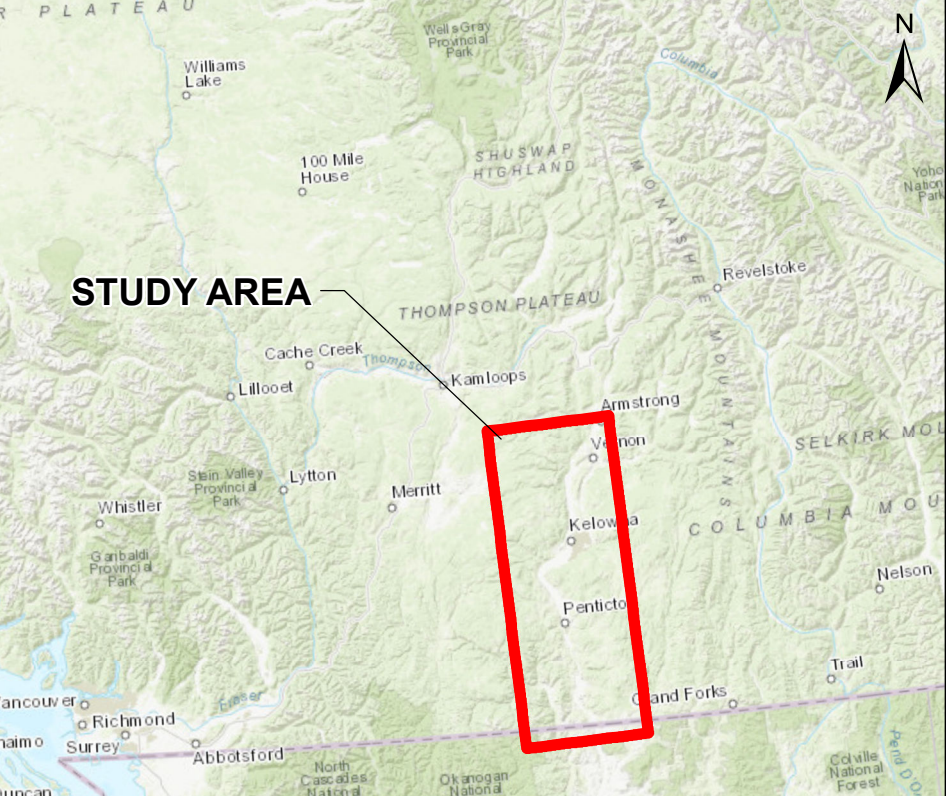
1. Design flood events are based on hydrologic modelling of the Okanagan River watershed. The hydraulic response is based on a combination of 1D and 2D numerical models developed by NHC using HEC-RAS software, and NHC SWAN models. The hydraulic models are calibrated to the 2017 flood event and validated to the 2018 flood event; due to limits on data availability the hydrologic model is calibrated using data from 1980-2010.
2. The digital elevation model (DEM) used to develop the model and mapping is based on Lidar data collected from March to November 2018 and provided by Emergency Management BC (EMBC), channel survey conducted by WSP in March, April, and June 2019, and additional survey data. See accompanying report for details NHC (2020).
3. Orthophoto imagery provided by EMBC and acquired in 2018. Additional base mapping and orthoimagery from Esri.
4. National Railway Network railway lines acquired from Natural Resources Canada.
5. Dike crest lines published by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development – Water Management in 2019 and acquired from DataBC.
6. Administrative boundaries acquired from DataBC.

**Disclaimer**

This document has been prepared by **Northwest Hydraulic Consultants Ltd.** for the benefit of **Okanagan Basin Water Board, Regional District of North Okanagan, Regional District of Central Okanagan, Regional District of Okanagan-Similkameen, Okanagan Nation Alliance** for specific application to the **Okanagan Mainstem Floodplain Mapping Project, Okanagan Valley, British Columbia, Canada (Ellison, Wood, Kalamalka, Okanagan, Skaha, Vaseux, and Osoyoos lakes and Okanagan River from Okanagan Lake to Osoyoos Lake)**. The information and data contained herein represent **Northwest Hydraulic Consultants Ltd.** best professional judgment in light of the knowledge and information available to **Northwest Hydraulic Consultants Ltd.** at the time of preparation, and was prepared in accordance with generally accepted engineering practices.


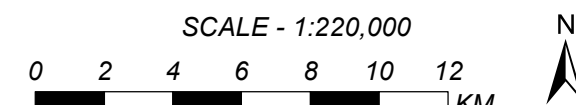
Except as required by law, this document and the information and data contained herein are to be treated as confidential and may be used and relied upon only by **Okanagan Basin Water Board, Regional District of North Okanagan, Regional District of Central Okanagan, Regional District of Okanagan-Similkameen, Okanagan Nation Alliance**, its officers and employees. **Northwest Hydraulic Consultants Ltd.** denies any liability whatsoever to other parties who may obtain access to this document for any injury, loss or damage suffered by such parties arising from their use of, or reliance upon, this report or any of its contents.





**OKANAGAN MAINSTEM  
FLOODPLAIN MAPPING**

INDEX MAP



Coordinate System: NAD 1983 UTM ZONE 11N  
Units: METRES; Vertical Datum: CGVD2013  
FCL values in both CGVD2013 and CGVD28 HTV2.0

Engineer	GIS	Reviewer
VCCB	MSN/MAO/SWM	DPM (rivers)/GFL (lakes)/PKK
Job Number	Date	
3004430 & 3006034	30-APR-2020, rev. 30-MAR-2021	