

**To:** Her Worship Mayor McKortoff and Members of Council

**From:** Christopher Garrish, Planner

**Date:** October 14, 2025

**Subject:** Flood Mitigation Plan (2022) Implementation

**Tracker No:** BLW-436, BLW-437, BLW-438

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**Recommendation:**

THAT Council receive the *Flood Mitigation Plan* prepared by TRUE Consulting Limited and dated September of 2022;

AND THAT Official Community Plan (OCP) Amendment Bylaw No. 1375.10, Zoning Amendment Bylaw No. 1395.10 and Land Use Procedures Amendment Bylaw No. 1235.13 be initiated.

**CAO Comments:**

Approved for Council consideration.

**Executive Summary:**

The purpose of this report is to present options and seek further direction from Council with respect to possible implementation of recommendations contained within the Town's *Flood Mitigation Plan* (2022), and as they relate to the Town's land use bylaws.

**Statutory Authority:**

Under Section 524 (Requirements in relation to flood plain areas) of the *Local Government Act*, "if a local government considers that flooding may occur ... [it] *may* [emphasis added], by bylaw, designate the land as a flood plain."

If a local government designates land as a flood plain it *may*, by bylaw, further "specify ... the flood level for the flood plain, and ... the setback from a watercourse, body of water or dike of any landfill or structural support required to elevate a floor system or pad above the flood level."

Further, in adopting a flood plain bylaw a local government "must consider the Provincial guidelines", being the latest version of the *Flood Hazard Area Land Use Management Guidelines* (2004). The stated objective of these guidelines is to:

*reduce or prevent injury, human trauma and loss of life, and to minimize property damage during flooding events. Experience has shown that regulating land development to keep people out of harm's way is the most practical and cost effective way of achieving these goals.*

Importantly, in adopting a flood plain regulation bylaw, a local government retains authority to grant exemptions if it considers it advisable *and* the exemption is consistent with the Provincial guidelines, or has received a report from a qualified professional that the land may be used safely for the use intended.

## **Background:**

The Town has, since at least 1980, regulated development within the flood plain associated with Osoyoos Lake through its zoning bylaw, and designated the “floodplain” as being any area with an elevation lower than 280.70 Geodetic Survey of Canada (GSC) datum.

These regulations have further required that the floor system or pad which supports a habitable area (e.g. the underside of the wooden floor system), is not lower than the flood construction level, which is generally the 200-year flood level shown on available provincial mapping).

## **Flood Mitigation Plan:**

In February of 2021, the Town of Osoyoos was successful in obtaining funding from the Community Emergency Preparedness Fund — under the Flood Risk Assessment, Flood Mapping & Flood Mitigation Planning stream (2021) — for the preparation of a Flood Mitigation Plan.

A *Flood Mitigation Plan* (2022) was subsequently completed by TRUE Consulting Limited in consultation with the Town and recommended, amongst other things, the following:

- *Revise the existing OCP defining the updated active floodplain as determined in this Mitigation Report. Consider modifying any existing land use classifications at this time and include in OCP revision as necessary.*
- *Update the existing Town of Osoyoos Floodplain Bylaw.*

At its meeting of April 11, 2023, Council’s Committee of the Whole (COTW) received a presentation from TRUE Consulting regarding the *Flood Mitigation Plan* (2022).

Council was advised that this Plan incorporated data from the Okanagan Basin Water Board’s Okanagan Mainstem Floodplain Mapping (2020) project, including the impact of new “wave analysis” (e.g. potential “wave runup heights at shore”).

The presentation further spoke to Flood Mitigation Projects that could be undertaken by the Town, including updating land uses bylaws (see above), flood proofing of infrastructure as well as further investigations to be undertaken.

## **Analysis:**

The *Flood Mitigation Plan* has assessed areas and infrastructure at risk of flooding near Osoyoos Lake with respect to people and existing infrastructure and is based on a 200-year flood event with consideration for both free board (factor of safety), climate change, and wave action.

The report has identified both Non-Structural and Structural solutions that can be utilized to mitigate flood event impacts throughout the Town and presented a list of 33 priority projects and activities that could be undertaken by the Town.

A summary of the priority projects and strategies that could be implemented by the Town are included within the Report (see Table 6-4) and includes, amongst other things, the following as “High” priorities in relation to the Town’s land use bylaws:

- Update the Town’s OCP land use policy statements and maps defining the updated 200-year active floodplain and wave action area (NS-1); and
- Develop a local government floodplain bylaw to include revised floodplain setbacks, wave action measures, flood construction levels and floodproofing requirements (NS-2).

In response, a number of options related to these two items are outlined for Council consideration below:

## 1. Floodplain Level

The Town’s OCP Bylaw currently speaks to establishing a floodplain level for Osoyoos Lake of 280.7 metres Geological Survey of Canada (GSC) datum, and which is currently applied through the Town’s Zoning Bylaw at Section 9.0 (Floodplain Regulations).

The *Flood Mitigation Plan* is recommending that this number be amended to 280.8 metres GSC datum and, in addition, that Schedule ‘3’ (Floodplain Maps) of the Zoning Bylaw be updated to include a new map reflecting this increase in floodplain levels.

This change is based on the floodplain work previously completed by the Okanagan Basin Water Board (OBWB), and which was expanded on in the *Flood Mitigation Plan*.

If implemented, it is understood that no an additional parcels would be included within the floodplain for Osoyoos Lake.

In response, the options available to Council are:

1. initiate draft Amendment Bylaw No. 1395.10 to increase the floodplain level to 280.8 metres GSC datum; or
2. maintain the current level of 280.7 metres GSC datum.

## 2. “Wave Flood Zone”

The *Flood Mitigation Plan* indicates that the Town’s current floodplain mapping utilized a single representative transect (with an assumed slope and surface treatment) to estimate wave related hazards for entire shoreline within the Town’s boundary.

The Town’s shoreline is, however, not uniform and has a variety of foreshore types (rock revetments, sand beaches, gentle slopes, steep slopes).

The use of a single representative transect implies that wave effects could be underestimated for some reaches and overestimated for others.

In response, the *Flood Mitigation Plan* is recommending the introduction of a more nuanced approach in which properties with softer, unprotected shorelines would face stricter building elevation requirements than those with engineered protection. For instance, if the shoreline is comprised of:

- gentle grass slopes, there will be a higher runup (up to ~1.7 metres); or
- steeper or armoured slopes: there will be a lower runup (~1.0–1.3 metres).

A more detailed description of how these regulations could be applied is as follows:

Flood Zone on Schedule "3"	Shoreline Treatment	Shoreline Slope (horizontal: vertical)	Freeboard (meters)	Flood Construction Level (CGVD28)
Wave Flood Zone	As required by a site-specific flood hazard assessment.	> 2H:1V	As required by a site-specific flood hazard assessment.	As required by a site-specific flood hazard assessment.
Wave Flood Zone	Rock	2H:1V	0.3m	282.1m
Wave Flood Zone	Rock	3H:1V		281.8m
Wave Flood Zone	Grass	3H:1V		282.2m
Wave Flood Zone	Grass	4H:1V		281.8m
Wave Flood Zone	Grass	5H:1V		281.5m
Inland Flood Zone	Not applicable	Not applicable	0.6m	280.8m

If the "Wave Flood Zone" were to be implemented, it is Administration's general understanding that the floodplain around Osoyoos Lake would expand inland, while minimum building elevations (FCLs) could increase by up to approximately 1.7 metres above current requirements in those areas.

At present, there are 471 parcels in the floodplain established by Schedule '3' of the Zoning Bylaw (this number will not change if the floodplain is increased to 280.8) and, of these, approximately 262 parcels would be included within the "Wave Flood Zone" (see Attachment No. 1).

Points for Council consideration include:

- implementing the "Wave Flood Zone" would accurately reflect the higher hazard that lake front properties directly exposed to waves experience;
- the floodplain map would become more nuanced and provide information beyond just a single contour by differentiating exposed vs. protected reaches;
- this would allow for early incorporation of "floodproofing" design considerations in the preparation of development plans for properties within the "Wave Flood Zone";

- lakefront development (e.g. dwellings and commercial buildings) in wave-exposed locations would need to be built significantly higher than under current regulations found in the zoning bylaw;
- assessing floodplain compliance based on shoreline treatment (e.g. landscaping) could be problematic as the landscaping of a property *may* change over time;
- tools are available to the Town to regulate and limit such changes to shoreline treatment, such as a Soil Permit or Development Permit, however, these are not always effective and some works may not trigger the need for such permits;
- the Town *may* not have the resources or expertise to monitor shoreline changes across all lakefront parcels over time; and
- such changes *may* result in a development being technically compliant at the time but functionally unsafe at a later date if changes to the shoreline treatment are made.

In response, the options available to Council include:

1. status quo (e.g. a “Wave Flood Zone” is not established and, instead, a uniform floodplain level is retained);
2. a “Wave Flood Zone” is established with flood construction levels based on the shoreline treatment (e.g. landscaping) of a property (see table above); or
3. a “Wave Flood Zone” is established with a standard flood construction level of 282.20 metres GSC datum, and lands within this zone having to comply with the following:
  - i) new buildings and structures must be constructed on a foundation that comprises either a concrete slab (at grade) or a crawl space;
  - ii) where fill is used to achieve a flood construction level, the face of the fill slope shall not be greater than 3:1; and
  - iii) the height of a retaining wall shall not exceed 0.6 metres.

Due to the challenges associated with the “Wave Flood Zone” and administering a floodplain regulation scheme based on landscaping at the foreshore, as well as the increased height requirements associated with a standard flood construction level (e.g. 282.20 metres GSC datum), Administration is recommending that this not be included in the zoning bylaw.

Conversely, the option to include the “Wave Flood Zone” in the zoning bylaw is available to Council, and Administration favours the implementation of a standard measurement (e.g. 282.20 metres GCS datum).

## Liability Considerations

While a local government can be liable for negligence, this is not the case if the alleged negligent act or omission is the result of a “policy decision”.

For instance, if Council resolves not to implement any of the recommendations contained within the *Flood Mitigation Plan (2022)* after weighing of competing interests, value judgments, and budget considerations with potential broad impacts and applicability to the community generally rather than targeting any particular individual or group, this would be a matter of “policy”.

As a matter of policy, any decision(s) would likely, therefore, be immune from liability for negligence.

## Summary

If summary, the *Flood Mitigation Plan* could result in the following:

- more land formally in the floodplain, resulting in more parcels trigger floodproofing requirements and/or covenants;
- higher finished floor elevations for some new lakefront developments, with some projects may being required to raise grades or change foundation designs;
- reduced development options as underground parking or low-lying amenities (associated with residential or resort developments) may no longer be feasible in areas exposed to wave action;
- enforcement challenges, over time, in relation to shoreline treatment; and
- clearer hazard delineation based on the most currently available data which, while stricter, may provides greater guidance for landowners, developers, and insurers regarding the flood risks associated with Osoyoos Lake.

In light of these considerations, and recognizing that Council is not required to take action on the recommendations contained within the *Flood Mitigation Plan*, Administration is recommending that amendments to the Town's land use bylaws be limited to the higher elevation of 280.8 metres GSC datum, supporting OCP policies and application requirements for a flood exemption request to Council.

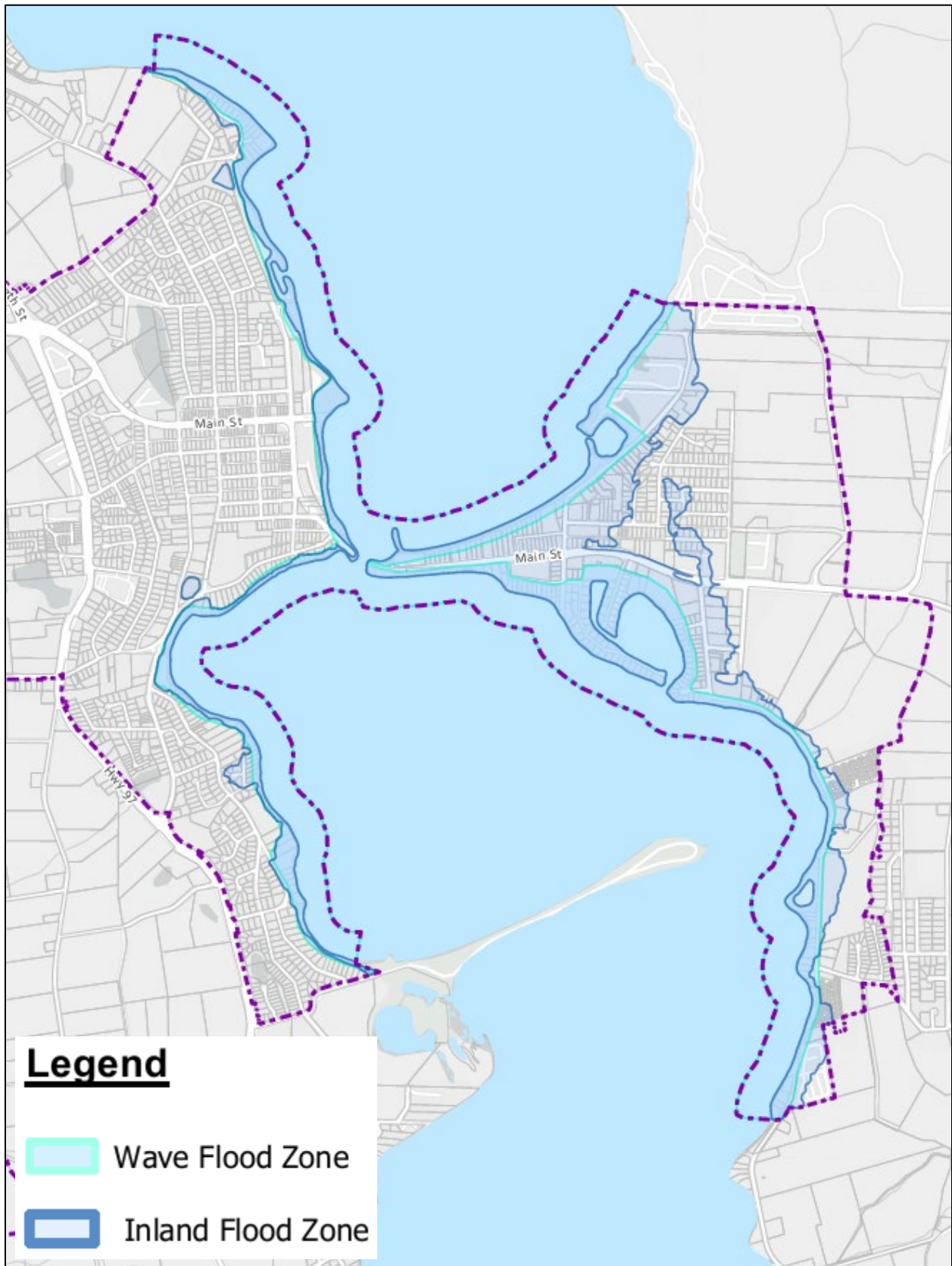
## Options:

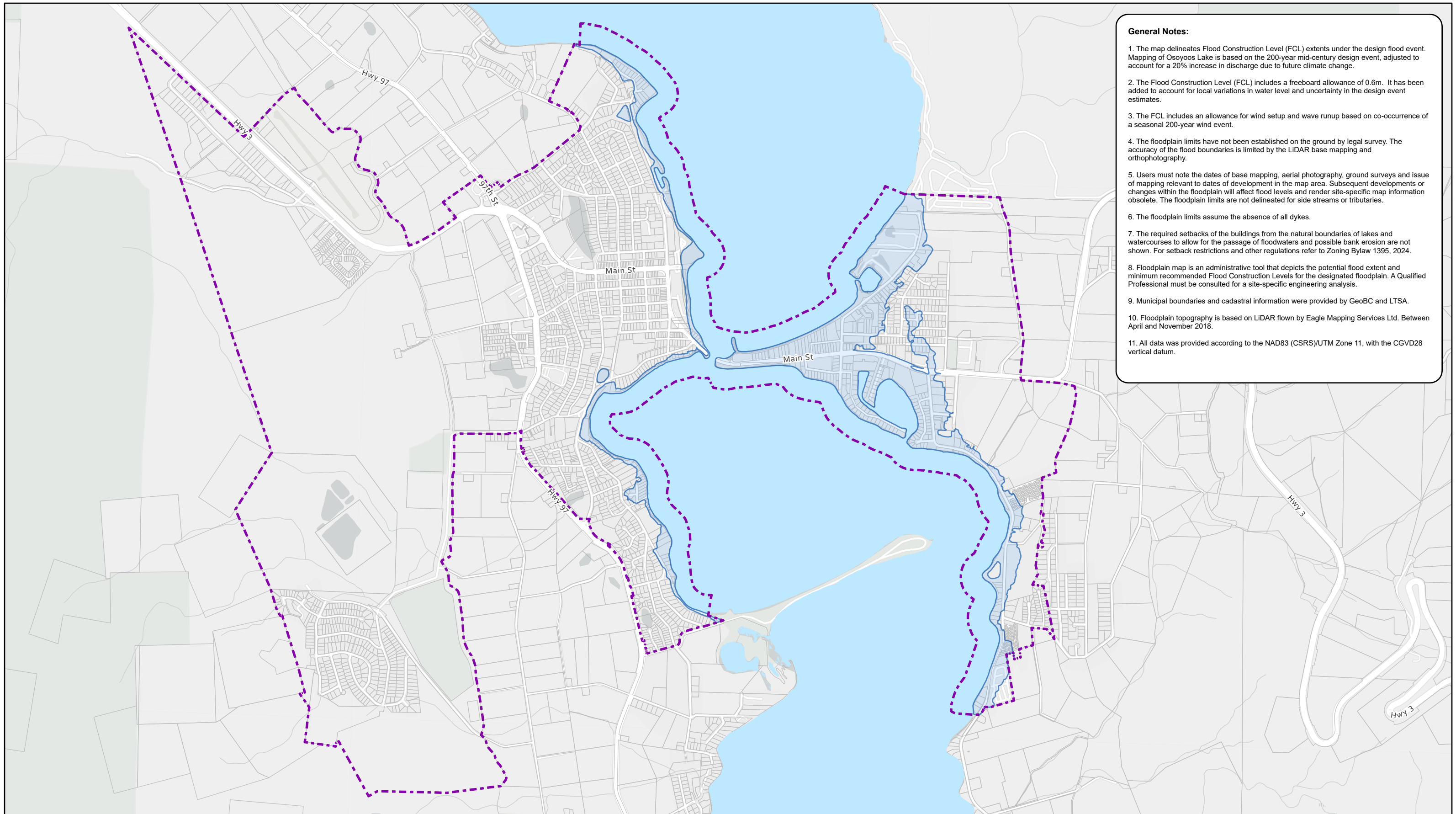
1. THAT Council receive the *Flood Mitigation Plan* prepared by TRUE Consulting Limited and dated September of 2022;  
AND THAT Official Community Plan (OCP) Amendment Bylaw No. 1375.10, Zoning Amendment Bylaw No. 1395.10 and Land Use Procedures Amendment Bylaw No. 1235.13 be initiated.
2. THAT Council receive the *Flood Mitigation Plan* prepared by TRUE Consulting Limited and dated September of 2022;  
AND THAT Official Community Plan (OCP) Amendment Bylaw No. 1375.10, Zoning Amendment Bylaw No. 1395.10 and Land Use Procedures Amendment Bylaw No. 1235.13 be initiated, subject to:
  - i) the "Wave Flood Zone" being incorporated in the zoning bylaw amendment.
3. THAT Council receive the *Flood Mitigation Plan* prepared by TRUE Consulting Limited and dated September of 2022;  
AND THAT no amendments to the Town's land use bylaws be initiated.

**Attachments:**

1. Draft Schedule 'C' (Floodplain Map with "Flood Wave Zone)
2. Flood Mitigation Report (2022)
3. Draft Official Community Plan (OCP) Amendment Bylaw No. 1375.10
4. Draft Zoning Amendment Bylaw No. 1395.10
5. Draft Land Use Procedures (LUP) Bylaw No. 1235.13

## Attachment No. 1 – Draft Schedule 'C' (Floodplain Map with "Flood Wave Zone")





- General Notes:**
1. The map delineates Flood Construction Level (FCL) extents under the design flood event. Mapping of Osoyoos Lake is based on the 200-year mid-century design event, adjusted to account for a 20% increase in discharge due to future climate change.
  2. The Flood Construction Level (FCL) includes a freeboard allowance of 0.6m. It has been added to account for local variations in water level and uncertainty in the design event estimates.
  3. The FCL includes an allowance for wind setup and wave runoff based on co-occurrence of a seasonal 200-year wind event.
  4. The floodplain limits have not been established on the ground by legal survey. The accuracy of the flood boundaries is limited by the LiDAR base mapping and orthophotography.
  5. Users must note the dates of base mapping, aerial photography, ground surveys and issue of mapping relevant to dates of development in the map area. Subsequent developments or changes within the floodplain will affect flood levels and render site-specific map information obsolete. The floodplain limits are not delineated for side streams or tributaries.
  6. The floodplain limits assume the absence of all dykes.
  7. The required setbacks of the buildings from the natural boundaries of lakes and watercourses to allow for the passage of floodwaters and possible bank erosion are not shown. For setback restrictions and other regulations refer to Zoning Bylaw 1395, 2024.
  8. Floodplain map is an administrative tool that depicts the potential flood extent and minimum recommended Flood Construction Levels for the designated floodplain. A Qualified Professional must be consulted for a site-specific engineering analysis.
  9. Municipal boundaries and cadastral information were provided by GeoBC and LTSA.
  10. Floodplain topography is based on LiDAR flown by Eagle Mapping Services Ltd. Between April and November 2018.
  11. All data was provided according to the NAD83 (CSRS)/UTM Zone 11, with the CGVD28 vertical datum.



**Disclaimer:**  
 Building and living within and adjacent to a floodplain is solely the responsibility of, and at the risk of, the owners and occupants of such lands. In conjunction with other land development applications, a site-specific hazard assessment may be required at the discretion of the Approving Officer or Building Inspector.  
 The Town of Osoyoos provides this information in good faith but provides no warranty, nor accepts any liability arising from any incorrect, incomplete or misleading information or its improper use. This information may be updated from time to time as changes occur. Zoning Bylaw 1395, 2024, and all amendments thereto, are available from the Town and should be consulted in interpreting and applying this information.  
 Industry best practices have been followed to generate the floodplain map. However, actual flood construction levels and extents may vary from those shown. Residual flood risk beyond that mapped exists for flood events more extreme than the design events. The Town, including officers and employees, do not assume liability for the designation, omission, or any reliance on the information shown on this map.

## Schedule 3 Floodplain Map

**Legend**

- Inland Flood Zone
- Osoyoos Lake
- Town Boundary

N  
  
 Scale: 1:20,000  
  
 0 200 400 600 800 1,000 m  
 Date: 10/7/2025