



### *Geotechnical Investigation*

The applicant submitted a Geotechnical Hazard Review (dated December 4, 2013) and Additional Geotechnical Comments (dated June 28, 2017) as part of the rezoning application. Both documents consider and provide recommendations on the conditions needed to build a second house on the property, including matters pertaining to siting, foundation design, drainage, and hazardous conditions. The 2017 comments build on the 2013 review as it relates to the subject rezoning application.

The 2013 review identifies the northeast portion of the property as the only suitable location for further development, assuming several conditions can be met to mitigate the risks of hazardous conditions, particularly slope instability. The documents identify the following conclusions to reduce risk and meet the City's requirements regarding geotechnical hazards:

- Connect the foundation to competent solid bedrock;
- Conduct additional geotechnical investigation to determine depth of bedrock;
- Collect all drainage water and direct off-site;
- Limit disturbance to existing slopes;
- Observe and review movement or rock fall of slope above Herbert Heights Road; and
- Prohibit any irrigation around the proposed development.

Staff reviewed the proposal and submission documents and are concerned that the above-noted measures cannot all be met in conjunction with each other, some recommendations do not meet City bylaws, and some measures will be difficult to enforce. These concerns are described in further detail below.

### *Bedrock & Foundation Design*

The geotechnical assessments recommend connecting the foundation to competent bedrock to adequately support the foundation and to limit the load to the slope to reduce the risk of a slide. The review suggests the bedrock may be 15 m below current grade and that further investigation is needed to determine the actual depth and provide more detailed recommendations for foundation design. The drilling and work needed to connect a foundation to underlying bedrock would cause significant disturbance to the existing slopes and vegetation in and around the proposed development area.

### *Drainage & Irrigation*

Soil saturation contributes to slope instability, making appropriate site drainage critical to develop safely and address potential risks around steep slopes. The 2017 Additional Geotechnical Comments states that "...it is intended to capture all site drainage water and direct it to the local storm system" and that all water should be piped "...to the storm system or another suitable location downhill and away from the slope." The City's piped storm system does not extend to this area, ending approximately 900 m away at the intersection of Cambridge Avenue and Ellis Street.

Without City storm sewer available, the only portion of the site that could be considered for the collection and release of storm water in accordance with City bylaws is the low, flat area along Poplar Point Drive. The geotechnical review does not speak to the suitability of using this area for this purpose, and it should be noted it is a low-lying area, only 2 to 3 m in elevation above the shoreline of Okanagan Lake. Should a storm water management plan determine this to be a feasible option, piping storm water down the slope would cause disturbance to the existing slope and vegetation in the centre of the site, which conflicts with the geotechnical recommendation to limit slope disturbance. It should also be noted that all of the storm

services that do exist in this quadrant of the City's North End were completely saturated during the 2017 flood event.

The geotechnical assessment further recommends that to limit soil saturation on and above the steep slopes, no irrigation should be used around the development area. Staff agree this is important; however, it is impossible to enforce.

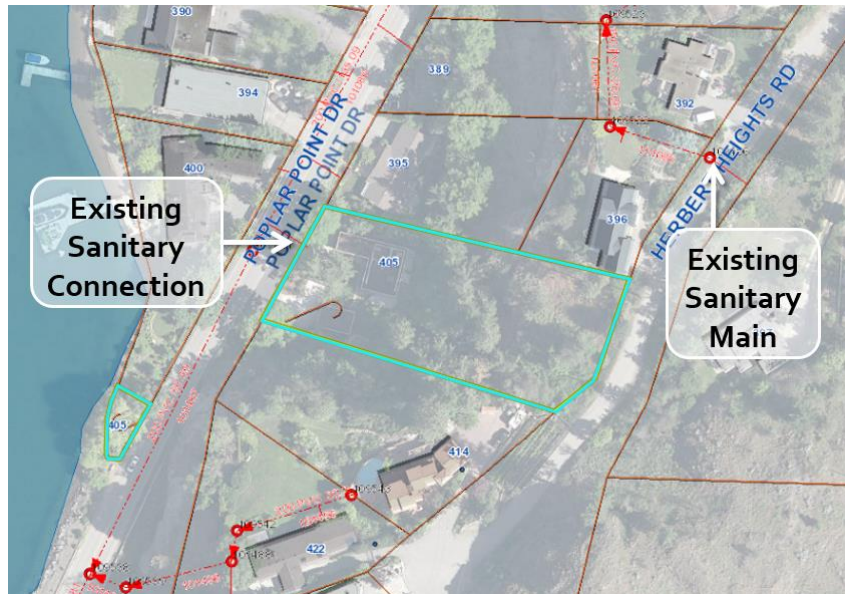
#### *Policy Context & Infrastructure*

Broadly speaking, Kelowna's Official Community Plan (OCP) promotes new development in already built-up areas, particularly Urban Centres, and seeks to make use of existing infrastructure to reduce greenfield development. OCP goals, objectives and policies highlight the importance of containing growth and creating more compact urban areas. While the subject property is outside of an Urban Centre, it is within the Permanent Growth Boundary in an area that generally has most urban services. Policy objectives must be considered in light of other policies and the specific site context, including access and connectivity, infrastructure impacts, and natural features.

OCP Policy 5.15.12 prohibits development on steep slopes, which are considered to be 30% or greater. This policy serves both to minimize the visual impact of hillside development and to reduce risks around slope instability in hazardous condition areas. Slopes in the proposed development area of the subject property are generally around 40%, with the slopes below reaching 80%. Meeting the conditions of development would cause disturbance to these slopes, resulting in visual impacts as well as concerns with slope stability as per the geotechnical assessments.

The property can only be accessed via Poplar Point Drive and Herbert Heights Road, which are narrow roads that do not meet standard minimum right-of-ways and do not have sidewalks. The City does not currently have plans to widen either road.

With regard to site servicing, the existing house has water and sanitary sewer connections off Poplar Point Drive. To rezone, the applicant would be required to provide additional connections off Herbert Heights Road. Currently, sanitary sewer service along Herbert Heights Road ends at the north end of 396 Herbert Heights Road to the north, or at the south end of 414 Herbert Heights Road to the south, as shown in the image to the right. To limit site disturbance, the applicant would be required to extend the sanitary main along Herbert Heights Road from the north rather than extend the existing service from below.



#### *Development Permits & Guidelines*

The subject property is within both the Natural Environment and Hazardous Condition Development Permit (DP) Areas. The purpose of these DPs is generally to ensure that negative impacts on

environmentally sensitive areas are minimized, and to protect people, property and structures from damage while providing stable building sites around hazardous areas. Development of this property would require issuance of DPs, and staff are concerned the proposal will be unable to meet relevant DP guidelines such as:

- Avoiding disturbance to rock outcrops and steep slopes;
- Ensuring safe collection and conveyance of onsite drainage and diverting it away from steep slopes;
- Conserving existing trees and vegetation to provide for ecosystem connectivity and protect steep slopes; and
- Setting development back from top of slope.

Furthermore, while the concept plan shows the house built into the hillside, it does not meet several key principles of hillside development as per the City's Hillside Design Guidelines, namely preserving the natural hillside character, retaining significant natural features and landforms, and preserving slopes greater than 30% as undisturbed.

*Council Policy No. 367*

As staff understand it, the applicant completed neighbour notification in accordance with Council Policy No. 367. Between August 18, 2017 and August 23, 2017, the applicant spoke or left an information package with residents of properties within 50 m of the subject property. At the time of writing, staff has been contacted by several nearby residents with concerns about the proposed development.

#### **4.0 Proposal**

##### **4.1 Background**

In 2015, a subdivision was approved that afforded the subject property a small waterfront area by subdividing a portion of 400 Poplar Point Drive and hooking the lot across Poplar Point Drive. This subdivision granted the subject property direct waterfront access, the ability to have a dock, and riparian rights. A no disturbance covenant was registered to prohibit any development on the small lakefront portion of the lot on the west side of Poplar Point Drive.

At the time, the applicant also enquired about subdividing the main property into two lots, with one accessed from Poplar Point Drive and the other from Herbert Heights Road. While the proposed lots met the subdivision regulations for lot dimensions in the Zoning Bylaw, staff had significant concerns with hazardous conditions and buildable area, and the Subdivision Approving Officer was not supportive of the proposal. This rezoning application effectively achieves the same objective of building a second house on the property, and it could be stratified provided the existing house was improved to meet the BC Building Code.

#### 4.2 Project Description

The application is to rezone the subject property to allow a second house to be built on the east side of the property, off Herbert Heights Road. The conceptual plan shows a three storey house with a proposed footprint of 3,350 sq ft. The proposed location for the development has steep slopes of approximately 40% with slopes of 80% below the proposed footprint. Access would be off Herbert Heights Road via a driveway with a switchback from the road into the property from the south.



Figure 1: Proposed Site Plan



Figure 2: Rendering in Neighbourhood Context



Figure 3: Massing & Hillside Context

No variances are being requested; however, should Council choose to support the rezoning proposal, staff would require more detailed plans with the expectation that all Bylaw regulations be met.

### 4.3 Site Context

The subject property is located between Poplar Point Drive and Herbert Heights Drive, within Kelowna's Central City Sector and the Permanent Growth Boundary. It is approximately 0.34 ha (0.83 ac) in area and currently has one single detached house fronting Poplar Point Drive.

A prominent slope forming part of the base of Knox Mountain runs through the property, and it rises in elevation from approximately 344 m along Poplar Point Drive to approximately 383 m along Herbert Heights Road. As shown in Figure 4 below, the property is relative flat in the western portion before rising steeply through the centre (grades of approximately 80%) and continuing to rise in the eastern portion (grades of approximately 40%) until it reaches Herbert Heights Road. City geotechnical mapping shows the property has moderate to high soil erosion potential as well as unstable terrain, consistent with the area topography and very steep slopes. Figures 5 and 6 show the soil erosion potential and terrain stability mapping for the area.

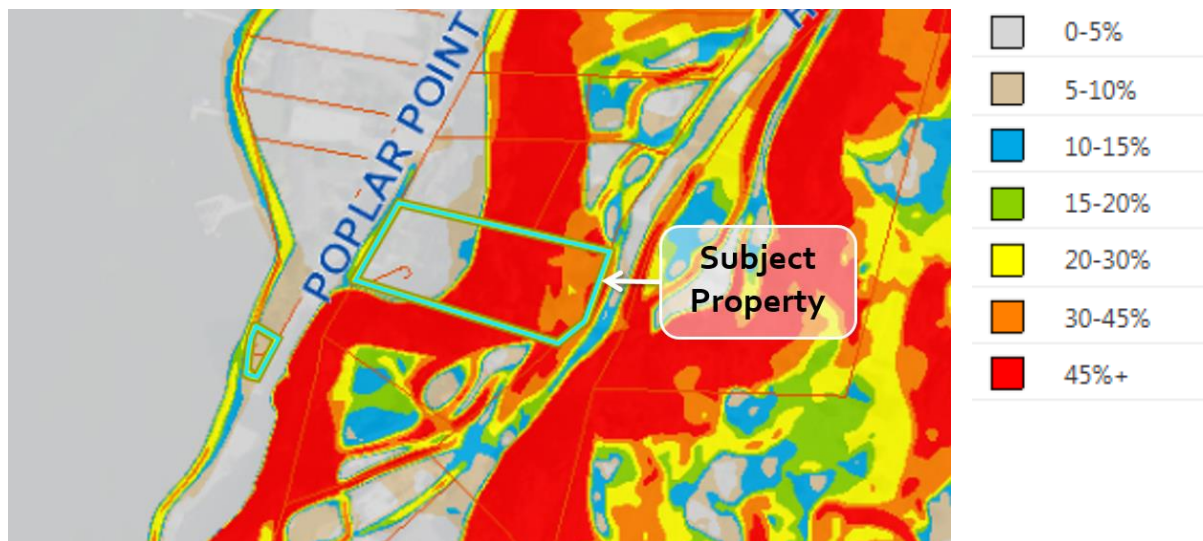


Figure 4: Slope Analysis

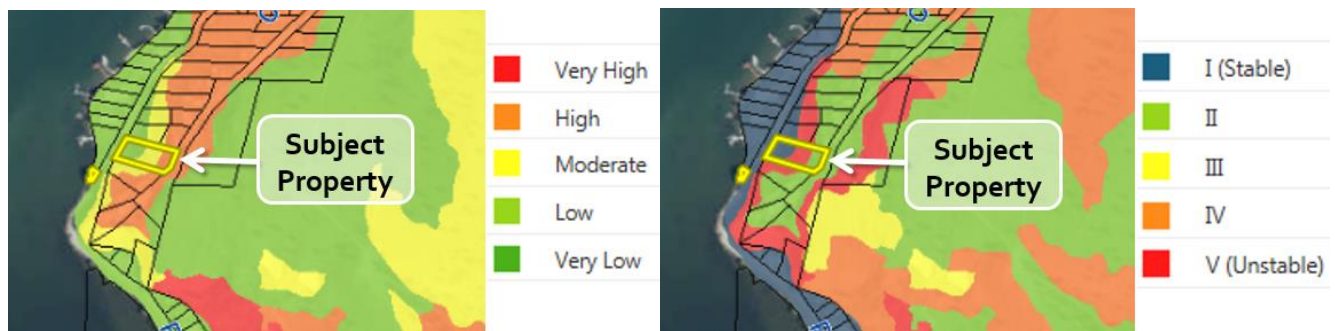


Figure 5: Soil Erosion Potential

Figure 6: Terrain Stability

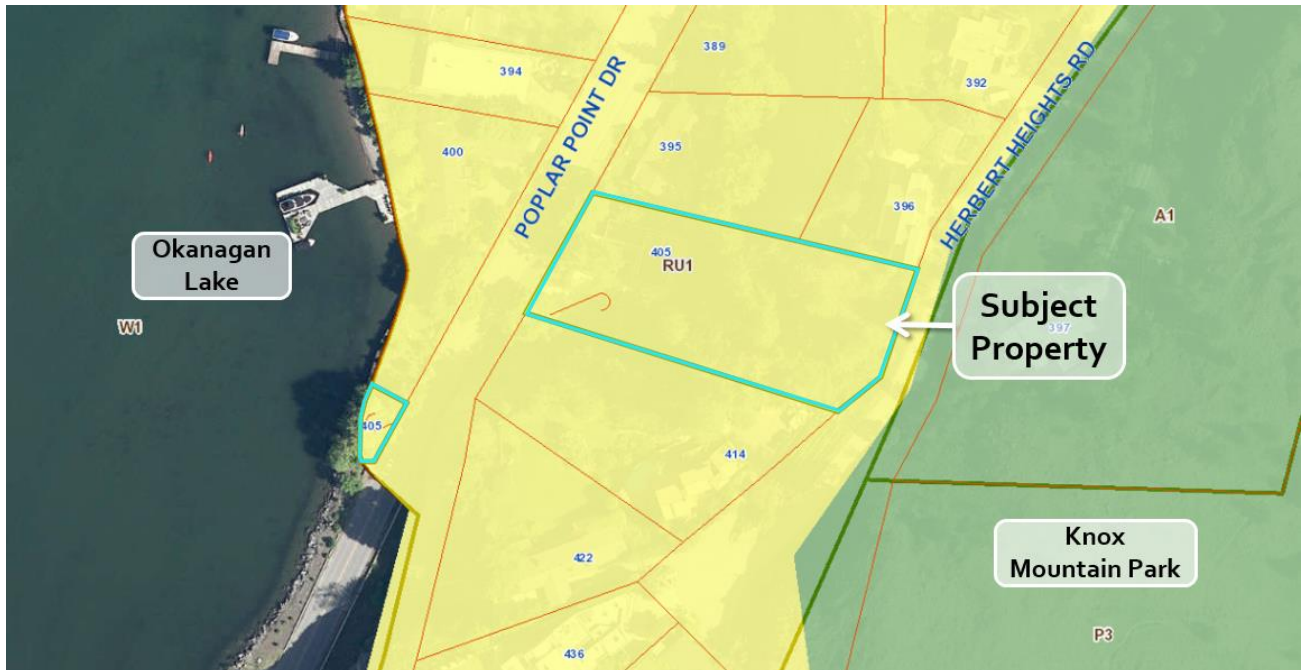
The surrounding area is characterized by large lot single dwelling housing, with Knox Mountain Park to the east and Okanagan Lake to the west. Adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	RU1 – Large Lot Housing	S2RES – Single / Two Unit Residential
East	A1 – Agriculture 1	PARK – Major Park / Open Space (Public)
South	RU1 – Large Lot Housing	S2RES – Single / Two Unit Residential
West	RU1 – Large Lot Housing	S2RES – Single / Two Unit Residential

Map 1: Subject Property



Map 2: Surrounding Area Context



## 4.4 Zoning Analysis Table

Zoning Analysis Table		
CRITERIA	RU6 ZONE REQUIREMENTS	PROPOSAL
Lot Area	700 m <sup>2</sup>	3,351 m <sup>2</sup>
Lot Width	18 m	35 m
Lot Depth	30 m	84 m

## 5.0 Current Development Policies

## 5.1 Kelowna Official Community Plan (OCP)

**Chapter 5: Development Process**

**Policy 5.2.3 Compact Urban Form.** Develop a compact urban form that maximizes the use of existing infrastructure and contributes to energy efficient settlement patterns. This will be done by increasing densities (approximately 75 - 100 people and/or jobs located within a 400 metre walking distance of transit stops is required to support the level of transit service) through development, conversion, and re-development within Urban Centres (see Map 5.3) in particular and existing areas as per the provisions of the Generalized Future Land Use Map 4.1.

**Policy 5.15.12 Steep Slopes.** Prohibit development on steep slopes (+30% or greater for a minimum distance of 10 metres) except where provided for in ASPs adopted or subdivisions approved prior to adoption of OCP Bylaw 10500.

**Chapter 12: Natural Environment Development Permit Guidelines***Relevant Objectives*

- Protecting, restoring, and enhancing environmentally sensitive areas to a functioning ecosystem;
- Minimizing soil disturbance; and
- Protecting biological diversity, wildlife and important wildlife habitats, features and functions.

*Relevant Guidelines*

- Avoid disturbance to rock outcrops, cliffs, and talus slopes.
- Conserve trees and protect their root systems from disturbance.
- Design and construct to avoid increases to the volume or sediment loads of stormwater discharge above those that would occur under "natural" pre-development conditions.
- In the context of land disturbance, the applicant will ensure the safe collection and conveyance of onsite drainage such that no downstream or immediately adjacent properties are adversely affected. Such works will also divert drainage away from hazardous condition (e.g. steep slopes) areas.

**Chapter 13: Hazardous Condition Development Permit Guidelines***Relevant Objectives*

- Prevent personal injury and property loss;
- Protect structures from damage; and
- Provide stable and accessible building sites.



### *Relevant Guidelines*

- Disturbance of steep slopes and hazardous condition areas will be avoided in accordance with City of Kelowna hillside development guidelines.
- Existing vegetation shall be maintained to control erosion and protect slopes.
- Development shall be set back a minimum of 10 metres from the top of ridgelines, cliffs or ravines. Variation of the setback may be considered if a geotechnical review can justify a reduced setback.
- Prohibit habitable buildings on hazardous condition lands where future danger cannot, or should not, be mitigated.

## **6.0 Technical Comments**

### **6.1 Development Engineering Department**

The application for a second dwelling at 405 poplar point poses a risk to the slope stability in the area. The Geotech report identifies that any infiltration can reduce the factor of safety of the slope. A requirement of the property is to contain all storm drainage on site and release to a City Storm system, however, there are no storm mains in the area to do this. The water table in this area is high so ground infiltration may not be achievable. Having a water and sanitary service constructed on the slope adds a risk to the stability of the slope. The trenching needed for the services will act as a conduit for any ground water above to be conveyed to the lower side of the property which will put the slope at risk. The water and sanitary service can be done using other access points but, the storm drainage requirement will be difficult to achieve.

## **7.0 Application Chronology**

Date of Application Received: July 13, 2017  
Date Public Consultation Completed: August 28, 2017

## **8.0 Alternate Recommendation**

THAT Rezoning Application No. Z17-0068 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot A District Lot 219 ODYD Plan EPP47591, located at 405 Poplar Point Drive, Kelowna, BC, from the RU1 – Large Lot Housing zone to the RU6 – Two Dwelling Housing zone be considered by Council;

AND THAT the Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Schedule "A" attached to the Report from the Community Planning Department dated October 16, 2017;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to a full Geotechnical Report being submitted to and accepted by the Community Planning Department, in accordance with a Terms of Reference to be established by the Community Planning Department;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to issuance of a Natural Environment and Hazardous Condition Development Permit for the subject property;

AND FURTHER THAT final adoption of the Rezoning Bylaw be considered subsequent to Section 219 restrictive covenants being registered on title to delineate no build and no disturbance areas, identify a building envelope, and prohibit irrigation, as well as address other matters that may be identified through the review process.

**Report prepared by:**  Laura Bentley, Planner II

**Reviewed by:**  Todd Cashin, Subdivision, Suburban and Rural Planning Manager

**Approved for Inclusion:**  Ryan Smith, Community Planning Department Manager

**Attachments:**

Attachment 1: Application Submission

Attachment 2: Schedule "A" – Development Engineering Memorandum