

APPENDIX B

SITE FEASIBILITY ASSESSMENT

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1 EXISTING CONDITIONS ANALYSIS

In 2021, UBC commissioned CTQ Consultants Ltd., along with Ecoscape Environmental Consultants and Ursus Heritage Consulting, to undertake an existing conditions analysis of the West Campus Lands summarized in the UBC Okanagan West Campus Lands Existing Conditions Report, January 2022. This report has been used as the basis for this existing conditions analysis and will be referred to throughout.



FIGURE 1: West Campus Lands
Source: Abigail Riley (UBCO)

1.1 EXISTING LAND USE AND CONTEXT

NEIGHBOURING USES

- City of Kelowna greenfield lands to the north;
- Ponderosa pine woodland area and the UBCO Main Campus to the east. Note: Two narrow legal parcels, not owned by UBC, along the eastern edge of the West Campus Lands almost entirely separate the lands from the Main Campus;
- City of Kelowna greenfield lands and the Glenmore landfill to the west; and
- Robert Lake and rural residential properties to the west and south.

CURRENT LAND USES

- Agricultural Production: The majority of the West Campus Lands are undeveloped leased land for forage production (alfalfa);
- UBC Plant Growth Facility: A 5000sq ft greenhouse facility supporting agricultural research, which was constructed with permission of the Agricultural Land Commission;
- Three leased Single Family Residential Homes; and
- Research activities at Robert Lake.

The West Campus Lands

Consist of **four legal parcels**, totalling **approximately 45 hectares** (112 acres), directly west of the UBCO Main Campus.



FIGURE 1.1: West Campus Lands looking north from John Hindle Drive
Source: Abigail Riley (UBCO)

FIGURE 1.2: Plant Growth Facility
Source: Abigail Riley (UBCO)

1.2 LAND USE REGULATIONS

There are three primary governing regulations that apply to the use of the West Campus Lands: The Agricultural Land Reserve, the City of Kelowna Official Community Plan and the City of Kelowna Zoning Bylaw

1.2.1 THE AGRICULTURAL LAND RESERVE

The entire West Campus Lands fall within the Agricultural Land Reserve (ALR).

The Existing Conditions Report identified the following permitted farm uses for land within the ALR which could be applicable to the West Campus:

- Common Agricultural uses (farming and ranching) including:
 - Tree Fruits
 - Vegetables (field, greenhouse)
 - Apiculture
 - Agroforestry
 - Forage crops
 - Ornamentals (floriculture, horticultural, nursery crops) and
 - Green housing
- Permitted farm uses in addition to or supporting common agricultural uses. These uses are subjects to conditions, thresholds and other limitations. The most relevant uses include:
 - Farm retail sales (provided the total area, both indoors and outdoors, does not exceed 300m²)
 - Agroforestry
 - Storage, packing & processing of farm products

- Temporary or seasonal Agri-tourism activities (no permanent facilities can be constructed or erected in connection with the activity)
- Wineries and Cideries (provided the agricultural land on which the alcohol production facility is located is more than 2 ha in area)
- Land development works for farm purposes Including structures (not including residential structures) or ancillary services, such as driveways or utilities, necessary for farm uses

The ALR permits some non-farm uses, subject to conditions, thresholds and other requirements. These uses may or may not be directly linked to agriculture, but are considered compatible with agricultural use and have low impact on the land base. The Existing Conditions Report identified the following non-farm uses which may be most relevant to the West Campus Lands:

- Education and research (provided related structures do not exceed 100m² per parcel and the use is not considered a school under the Schools Act)
- Open-land Parks, Conservation, Passive recreation (provided related structures do not exceed 100m² per parcel and the purpose does not include creation of a wetland intended to manage urban runoff or waste)
- Production, storage and application of Class A compost
- Utilities within an existing right of way
- Production & development of biological products used in integrated pest management.

The Report also identified a series of Agricultural Land Commission (ALC) policies that may be applicable to the West Campus Lands. Key policies that may affect the initial conceptual plan layout include:

- Policy L-16: Which prohibits residential structures on leased farm land
- Policy L-24 - Limits land taken out of agricultural production to accommodate farm-related commercial and farm-related industrial uses, if any, to no more than 5% of parcel coverage.

Finally, land within the ALR will not be supported for further parcelization.¹

The Agricultural Land Reserve (ALR)

The ALR is “a provincial zone in which agriculture is recognized as the priority use. Farming is encouraged and non-agricultural uses are restricted”¹

¹ Source: <https://www.alc.gov.bc.ca/ALC/content/ALR-maps/living-in-the-ALR>

¹ Source: <https://www.kelowna.ca/our-community/planning-projects/2040-official-community-plan/ch-3-future-land-use>

1.2.2 CITY OF KELOWNA OFFICIAL COMMUNITY PLAN

FUTURE USE DESIGNATION

The City of Kelowna Official Community Plan (OCP) identifies the future land use designation for the majority of the site as Rural-Agricultural & Resource (R-AGR). The R-AGR designation is in keeping with the overall goals of the ALR, with a focus on protecting "agricultural lands from urban encroachment and incompatible uses" as part of a strategic plan to support "agricultural producers, ensuring the sector continues to be attractive and economically viable."¹ The City has indicated it is open to the potential expansion of UBC activities into the West Campus Lands through the inclusion of OCP Policy 6.1.5. ALR Lands At UBCO which states "Consider UBCO campus expansion onto ALR lands that have a future land use of Rural – Agricultural & Resource (R-AGR) at such time as a comprehensive campus planning process is complete, in consultation with agricultural stakeholders."

The southern portion of Lot C south of Upper Campus Way has been designated as Education/Institutional (EDINST) under the OCP. This land use designation allows for "key educational, cultural, government and religious activities take place...Characterized by schools, hospitals, places of worship, recreation centres and other facilities that provide public services delivered by governments or not-for-profit institutions."² The area is still within the ALR and A-1 City of Kelowna Zoning and therefore such uses would require approval from ALC and City.

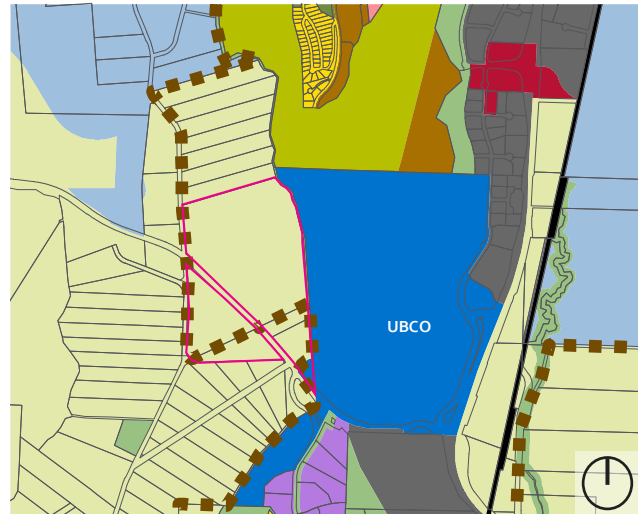
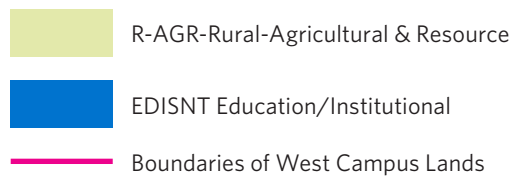


FIGURE 2: Land Use Designation Plan.

Source: City of Kelowna Official Community Plan 2040



¹ Source: <https://www.kelowna.ca/our-community/planning-projects/2040-official-community-plan/ch-8-rural-lands>

² Source: <https://www.kelowna.ca/our-community/planning-projects/2040-official-community-plan/ch-3-future-land-use>

DEVELOPMENT PERMIT AREAS

The OCP includes several Development Permit Areas (DPA) which identify locations with special conditions that must be considered in development. This includes such things as protection of development from hazards, establishing objectives for form and character or protecting the natural environment. Subdivision, alteration, or construction on lands identified within DPAs typically must address the specific conditions of the applicable DPA as part of the development permit process.

The following DPAs are applicable to the West Campus Lands:

Natural Environment DPA: This DPA is intended to reduce negative impacts on environmentally sensitive areas through requiring protection, restoration and enhancement measures. The applicable areas within the West Campus Lands includes Robert Lake and the adjacent existing wetlands, as well as the coniferous woodland at the eastern perimeter of the site as shown in green in Figure 3. The DPA identifies a series of guidelines, however, to identify the specific guidelines which must be addressed in the development permit submission, an assessment report, prepared by a professional qualified in the relevant discipline and licensed to practice in British Columbia is required. Guidelines which may be applicable to the Conceptual Structure Plan include:

- A 15m buffer (minimum Riparian Management Area) from the natural boundary of Robert Lake (classified as a wetland, no association with fish habitat).
- Avoid locating infrastructure corridors along, parallel to, or across riparian ecosystems or sensitive ecosystems.
- Retain intact ecosystems and their connectivity. Where practical and necessary, reconnect fragmented ecosystems by restoring habitat. Avoid the creation of isolated islands of natural habitat

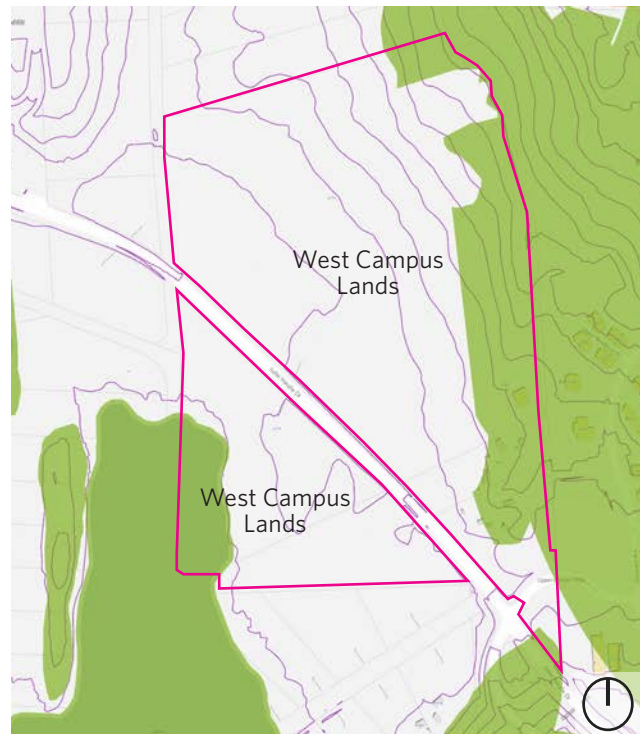


FIGURE 3: Natural Environment DPA.

Source: City of Kelowna Official Community Plan 2040 Map Viewer

Farm Protection DPA: This DPA is intended to protect farm land and farm operations, for agricultural purposes as a primary use. As the lands are wholly within the ALR, the applicable section of this DPA is the *Farm Protection DP for Development on Agricultural Lands*. Guidelines which may be applicable to the Conceptual Structure Plan includes:

- To generally locate structures such as residential buildings, farm retail sales, alcohol production facilities, and any other structures and services related to the public that are defined as farm uses under the ALC Act near the road entrance or in a location that minimizes road construction to reduce the footprint and extent of services through the lot with the goal of reducing impact on the agricultural potential.
- Provide 4-6m wide vegetated buffers around residential uses as well as intensive/offensive agricultural uses.
- Locate new manure and compost storage and operations at least 60m from the urban boundary (or 30m if a vegetated buffer is provided)

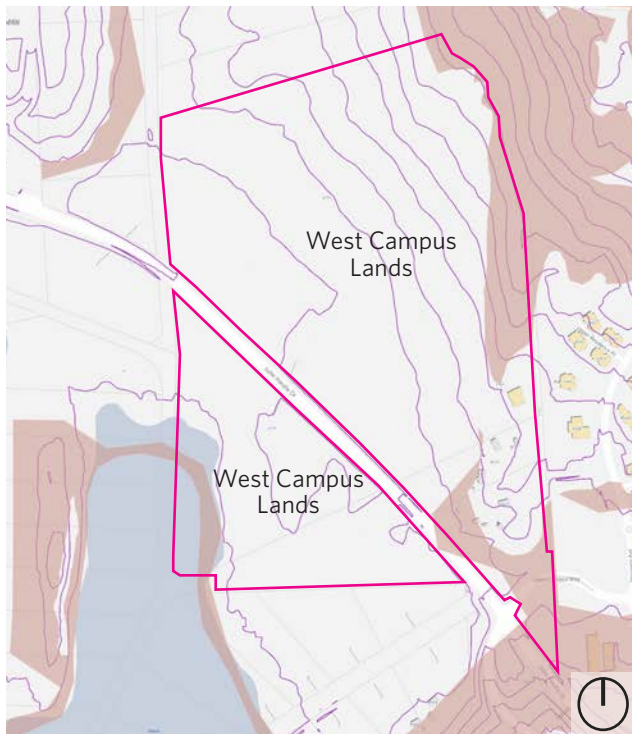


FIGURE 4: Hazardous Conditions DPA.
Source: City of Kelowna Official Community Plan 2040 Map Viewer

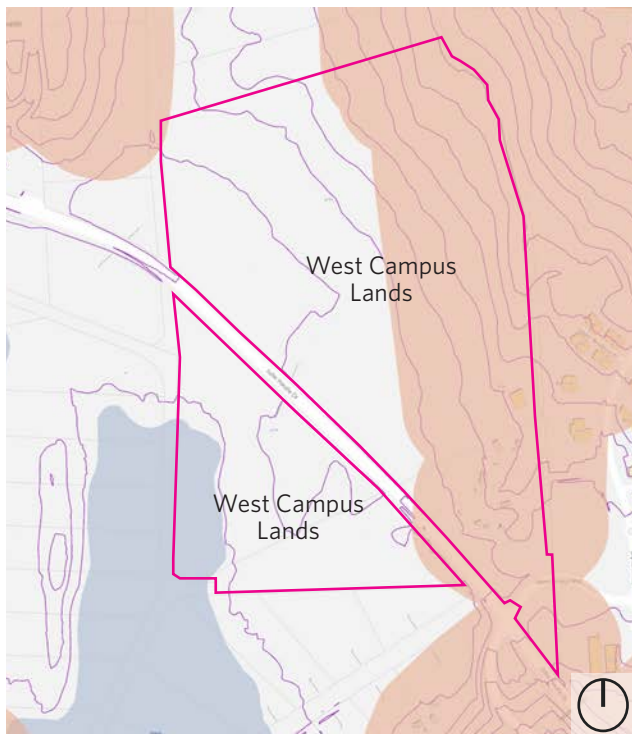


FIGURE 5: Wildfire DPA.
Source: City of Kelowna Official Community Plan 2040 Map Viewer

Hazardous Conditions DPA: This DPA is intended to protect people and property from hazardous conditions on a site. Portions of the eastern perimeter of the West Campus Lands (shown in pink on Figure 4) have been identified within this DPA due to the steep slope of the landscape which may be vulnerable to slope instability. The extent to which action must be taken to address the issue is subject to a geotechnical analysis and a detailed survey of the site. Guidelines applicable to the Conceptual Structure Plan may include:

- Do not excavate, fill, place, erect or construct any building or permanent structure in areas subject to hazardous conditions.
- Design the development to minimize any alterations to the steep slope and to reflect the site rather than altering the site to reflect the development.
- Preserve areas with natural slopes of 30 per cent or more as natural open space.
- Maintain existing vegetation to absorb water, minimize erosion and protect the slope. Revegetate disturbed slopes where gullied or bare soil is exposed as per a qualified professional's report.

Wildfire DPA: This DPA is intended to ensure that all new development is resilient to catastrophic wildfire hazardous fuel conditions through abatement. A significant area of the eastern portion of the site falls under this DPA (shown in pink on Figure 5) and any development within will require a Wildfire Management Plan. Key guidelines applicable to the Conceptual Structure Plan may include:

- Where wildland areas abut new subdivisions, consider placing roadways and/or trails adjacent to the wildland areas. These roads and or trails improve access to the interface for emergency vehicles and provide a fuel break between the wildland and the subdivision.
- Design subdivisions so building sites are located on the flattest areas of the property. Avoid gullies or draws that accumulate fuel and funnel winds.

1.2.3 CITY OF KELOWNA ZONING BYLAW

The City of Kelowna has zoned the entire West Campus Lands as A-1 Agricultural Zone, relating to its OCP land use designation and its ALR classification.

The Existing Conditions Report identified the most relevant allowable principal uses in this zone for the West Campus Lands including:

- Agriculture
- Aquaculture
- Greenhouses and plant nurseries
- Intensive agriculture
- Utility services with a minor impact to the land

Relevant permitted secondary uses for A-1 zoned lands within the ALR, allowed in conjunction with a principal use include:

- Agri-tourism
- Alcohol production facilities
- Farm retail sales stands
- Forestry
- On-farm processing

Additional design requirements that may affect the Conceptual Structure Plan include:

- Maximum site coverage for agricultural use is limited to 35% but may be increased to 75% for greenhouses and plant nurseries with closed wastewater and storm water management systems.
- The height of agricultural structures such as greenhouses and plant nurseries are limited to 16 m.
- A series of area, setback and height requirements as shown in the table below.

FIGURE 6: Table: Zoning limits on Structures.
Source: City of Kelowna Consolidated Zoning Bylaw No. 8000

Use	Gross Area	Floor	Minimum setback distances			Height
			Front and Flanking Street	Side Yard	Rear Yard	
Single detached housing on lots less than 0.4 ha, unless section 1.7.1 applies	see 11.1.6 (c)		6.0 m	3.0 m	10.0 m	Lesser of 9.5 m or 2 ½ storeys
Single detached housing on lots 0.4 ha or greater ^a	See 11.1.6 (b)		6.0 m	3.0 m	10.0 m	Lesser of 9.5 m or 2 ½ storeys
Accessory Buildings or Structures (including Garage / Carport)	130 m ²		6.0 m	3.0 m	3.0 m	6.0 m
Mobile Home for Immediate Family, where permitted (ALR only)	300 m ² , maximum 9 m wide		6.0 m	3.0 m	10.0 m	4.8 m
Agricultural Structures	see 11.1.6 (d)		4.5 m	3.0 m	3.0 m	16.0 m
Greenhouses and Plant Nurseries, with closed wastewater and storm water management systems	see 11.1.6 (d)		6.0 m	3.0 m	3.0 m	16.0 m
Farm Retail Sales Stands	300 m ² ^a		6.0 m	3.0 m	3.0 m	6.0 m
Kennel	500 m ²		15.0 m	15.0 m	15.0 m	Lesser of 9.5 m or 2 ½ storeys
Stables	see 11.1.6 (d)		15.0 m	15.0 m	15.0 m	16.0 m
On Farm Processing	see 11.1.6 (d)		6.0 m	3.0 m	3.0 m	16.0 m
Alcohol production facilities processing facility	Per ALC Regulation		6.0 m	3.0 m	3.0 m	Lesser of 9.5 m or 2 ½ storeys
Alcohol production facilities tasting facility or lounge	Per ALC Regulation		6.0 m	6.0 m	10.0 m	Lesser of 9.5 m or 2 ½ storeys

^a Farm Retail Sales Stands, selling only produce grown on the site or another site operated by the same producer do not have a maximum area. If non-farm products are being sold, then the total area, both indoors and outdoors, used for retail sales of all products must not exceed 300m² and at least 50 per cent of the that retail sales area must be for the sale of farm products produced on the farm.

1.2.4 OTHER APPLICABLE LAND USE REGULATIONS

CITY OF KELOWNA AIRPORT

UBCO is located to the southwest of the Kelowna International Airport (YLW) and the West Campus Lands are within its height restriction area. As shown in Figure 7 below, buildings and structures in the red area (above 463.6m above sea level) would penetrate the height restriction and therefore would require an application for an exemption from Transport Canada and NAV Canada. Buildings and structures in the orange area would require exemption if their height exceeds 463.6m above sea level. Refer to the CTQ report in Appendix A for more detail.

LEGAL CHARGES

There are a series of legal charges registered on title of the four parcels of the West Campus Lands. These legal charges generally prevent any permanent structure development within their defined boundaries. These are discussed in detail in the Existing Conditions Report and are illustrated in Figure 8 below. It is noted that the largest legal charge (1-8A) covering a portion of Lot 1, identifies that no complaints can be made due to noise, odour, dust, emissions, or vibrations related to the adjacent landfill.

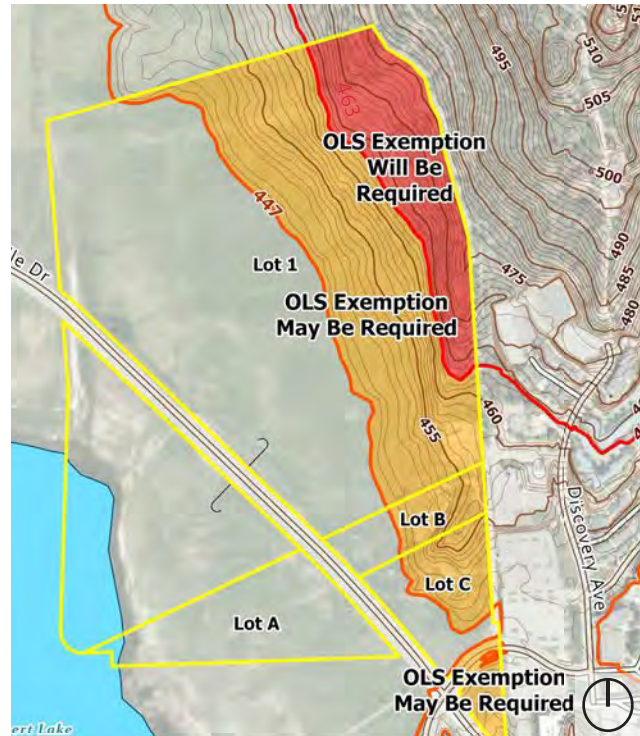


FIGURE 7: Airport Height Restriction Areas.
Source: UBC Okanagan West Campus Lands Existing Conditions Analysis January 2022, prepared by: CTQ

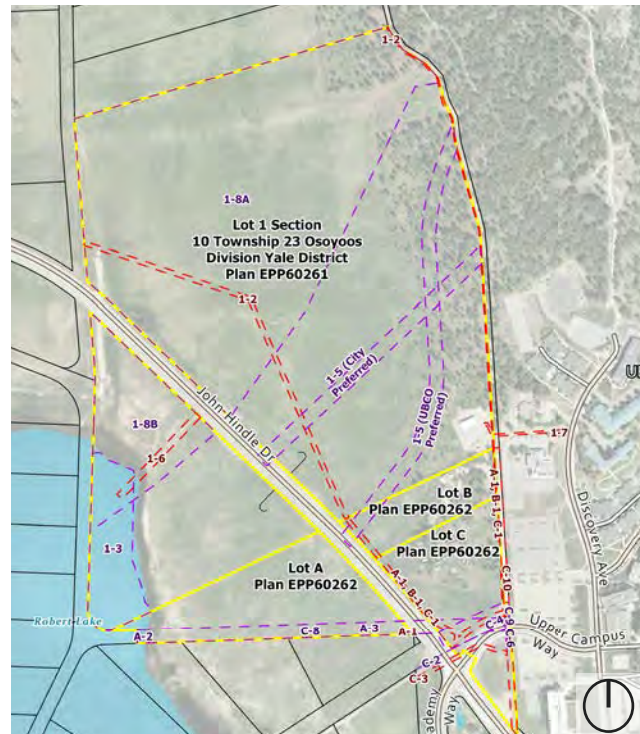


FIGURE 8: Legal Charges.
Source: UBC Okanagan West Campus Lands Existing Conditions Analysis January 2022, prepared by: CTQ

PROVINCIAL AND FEDERAL REGULATIONS

The Existing Conditions Report details a series of provincial and federal regulations which may be applicable to the West Campus Lands. As the project reaches the next phase of development, the following regulations would need to be reviewed to further refine the plan and identify the appropriate regulatory process:

- **BC Water Sustainability Act (WSA):** The WSA includes a series of regulations to "ensure a sustainable supply of fresh, clean water."¹ Of relevance for the West Campus Lands are protections for aquatic ecosystems, which will likely apply to any development work around Robert Lake, and licensing groundwater for non-domestic use.
- **Federal Migratory Birds Act and Wildlife Act – Avian Nesting Windows Regulation:** This act protects the nests and eggs of migratory birds. It protects the nests of specific identified species, such as bald eagles, which cannot be disturbed and also places limits on the timing of vegetation clearing during construction.
- **BC Heritage Conservation Act:** This act includes provisions for the protection of archaeological sites. It is noted that areas of archaeological potential have been identified on the West Campus Lands.
- **BC Farm Practices Protection (Right to Farm) Act:** This Act protects farmers from liability or injunctions resulting from nuisances, such as noise, odour and dust, that are associated with the normal practice of farming.
- **BC Wildlife Act and Species at Risk Act:** This Act protects endangered and threatened wildlife species including species of concern. As noted in the Existing Conditions Report "given the presence of at-risk species within the West Campus Lands, it is important that the proposed development does not result in the loss or degradation of critical habitat, namely Robert Lake and its surrounding transitional ecosystems. Robert Lake is a regionally significant wetland and an important habitat area for wildlife. The development of the West Campus Lands must be carefully planned to ensure that it does not result in the destruction of wildlife or in stormwater inflows that alter the water balance of Robert Lake and negatively affect the wildlife that depend on it."²

¹ Source: <https://www.gov.bc.ca/gov/content/environment/air-land-water/water/laws-rules/water-sustainability-act>

² Source: UBC Okanagan West Campus Lands Existing Conditions Analysis January 2022 Part A prepared by CTQ Engineering, Planning & Urban Design

LAND USE REGULATIONS: SUMMARY OF OPPORTUNITIES AND CHALLENGES

The following summary is excerpted from the Existing Conditions Report:

Land Use and Regulations	
Opportunities	Challenges
Proximity to UBCO Main Campus	Restrictive nature of ALR and A1 Zoning
Abundance of land capacity, mostly undeveloped	ALC approvals required for non-farm uses, new roads and infrastructure
Agricultural and resource uses supported by OCP and Zoning	Bisected by John Hindle Drive
ALR permitted farm and non-farm uses	Separated from Main Campus by two narrow legal parcels
OCP considers UBCO use of ALR lands through comprehensive planning and considers expansion of campus uses to the West Campus Lands/ALR lands beyond the agricultural uses already permitted	Existing single-family residences
Portion of lands designated in new OCP for education/institutional uses and located within the Permanent Growth Boundary	Charges on title which may restrict development
	Environmental Regulations may be triggered in proximity to Robert Lake or intact woodland (Environmental DPA, WSA etc)
	Height of structures restricted due to proximity of Airport
	Heritage Regulations and mitigation measures may be triggered as part of ongoing archeological analysis

1.3 SITE CHARACTERISTICS

1.3.1 SITE ACCESS AND CIRCULATION

ROADWAYS/VEHICLE ACCESS

There are two developed roadways within the West Campus Lands: John Hindle Drive and Upper Campus Way. The location of these roads and the key access points to the site are shown in Figure 9.

John Hindle Drive is a two lane road, with a 3m wide shared cycling path, that is classified as a major arterial road and truck route. It bisects Lot 1, effectively separating the Lot into two pieces with limited connectivity.

There are currently three access points into the West Campus Lands from John Hindle Drive:

- Two private gravel driveway access points proximate to where John Hindle Drive enters the West Campus Lands at the north-west corner of the site. These access points are secured by gate and provide tenant access to leased agricultural lands.
- A gated gravel drive accessing leased agricultural lands in Lot A.

Given its designation as a major arterial road, any proposed additional intersections or access points from John Hindle Drive will require a traffic study and approval by the City of Kelowna.

Upper Campus Way is a private university road and currently provides the only direct road access between the Main Campus and the West Campus Lands. Connections between the West Campus Lands are currently limited due to two narrow legal parcels, one owned by the City of Kelowna, the other by Glenmore Ellison Irrigation District (GEID), that run along the eastern perimeter of West Campus Lands. Any crossings of those parcels requires an easement or acquisition of these lands. One such easement currently exists to access the UBCO Plant Growth Facility through an adjacent parking lot within the Main Campus. The potential connection to the Main Campus is further complicated by the sloped topography along the eastern perimeter of the site.

The Existing Conditions Report identifies "Upper Campus Way and the parking area along the west side of the Main Campus may provide opportunity for fairly level, undeveloped locations to extend and formalize access between the Main Campus and West Campus Lands, however consideration will need to be given to how these connections integrate with the existing Main Campus road network and appropriately serve future use on the West Campus Lands."¹

The only access to Lots B and C is provided off Upper Campus Way through a private gravel drive that runs from Upper Campus Way along the eastern portion of Lots B and C. This drive is located on City-owned land.

There are no plans for any additional public roadways within the West Campus Lands identified in the 2040 OCP. However, there is an existing covenant for a future public road connecting John Hindle Drive and Country Club Drive. The covenant identifies two options for the road location, one preferred by the City and one preferred by UBC, with a 20m wide right of way. This road would bisect the northern portion of Lot 1. However, the Existing Conditions Report noted that there may be an opportunity for UBC to request the City to discharge this covenant as it does not appear in the 2040 OCP or the City of Kelowna 2040 Transportation Master Plan.

Any new roadways proposed within the West Campus Lands through the Conceptual Structure Plan may be affected by the soil composition of the site. The clay rich soils may require significant treatment or removal for road subgrade. A geotechnical report would be required to determine the extent of work required and any limitations to proposed locations for roadways.

¹ Source: UBC Okanagan West Campus Lands Existing Conditions Analysis January 2022 Part A prepared by CTQ Engineering, Planning & Urban Design

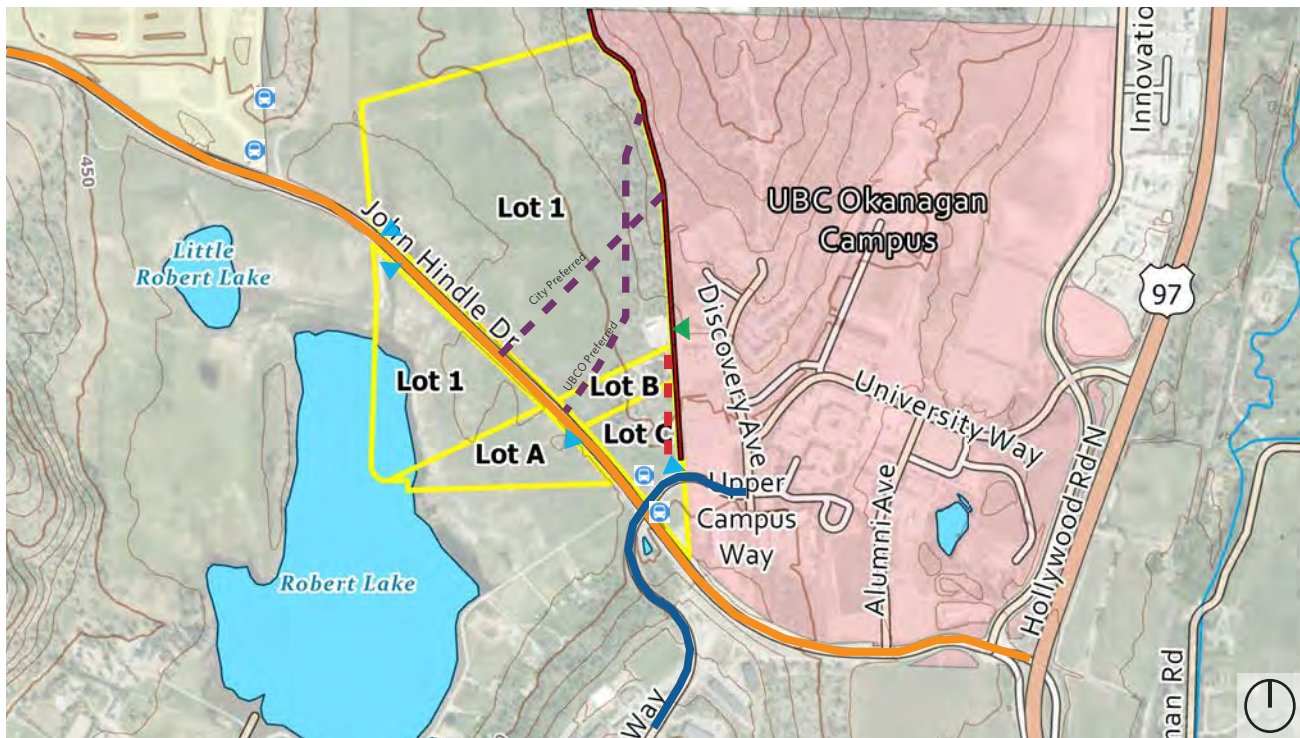
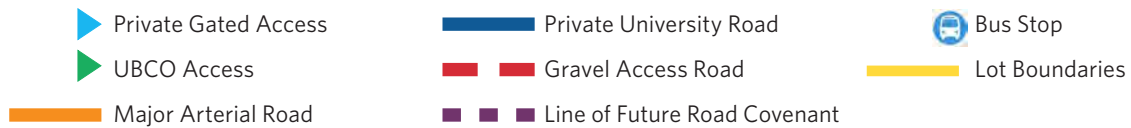


FIGURE 9: Transportation Links Diagram.

Background Source: UBC Okanagan West Campus Lands Existing Conditions Analysis January 2022, prepared by: CTQ



TRANSIT

The West Campus Lands are currently served by the Route 6 Glenmore/UBCO Express which travels along John Hindle Drive. The nearest transit stop is at the intersection of John Hindle Drive and Upper Campus Way at the southern end of the site.

BIKE AND TRAIL NETWORK

There is an existing 3m wide shared cycling path that runs along the south side of John Hindle Drive. This path connects into bike paths within the Main Campus at Upper Campus Way and Hollywood Road North as shown in Figure 10.

There are currently no formal trails within the West Campus Lands. There are several existing trails running north-south along the east side of the West Campus Lands, on the GEID's water main parcel and on the Main Campus as part of the Pine Loop Trail shown on Figure 11 above. The Conceptual Structure Plan could consider connections to this trail system to support healthy recreation, as well as potential commuting connections.

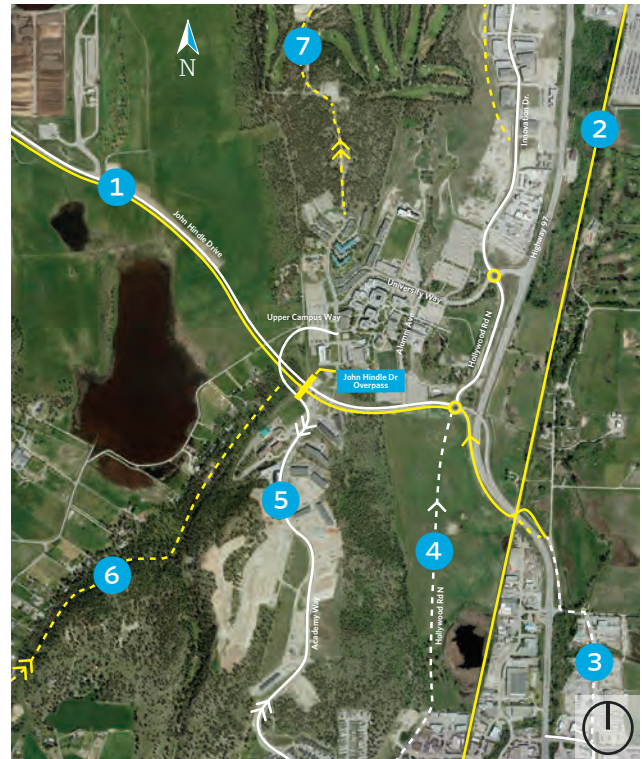


FIGURE 10: Existing & Future Cycling Routes Map.
Source: UBC, www.transportation.ok.ubc.ca



FIGURE 11: UBCO Campus Trail Map.
Source: UBC, www.campushealth.ok.ubc.ca

The table below is summary of key Site Access & Circulation opportunities and challenges excerpted from the Existing Conditions Report:

Site Access & Circulation	
Opportunities	Challenges
Potential connectivity from John Hindle Drive	ALC and City approvals (for circulation improvements)
Potential connectivity from Main Campus	No developed roadways within West Campus Lands
Potential to pursue removal of existing covenant for future north-south public road with the City	Topography and grade constraints throughout the West Campus Lands
Upper Campus Way and west side parking lots on Main Campus provide potential locations for fairly level road connections	Clay-rich soils requiring soil treatment/removal
Connections to adjacent trail system on the Main Campus	Potential impact of existing covenant for the dedication and development of a future public north-south road on the area's development and connectivity
	Limited points of access across and from John Hindle Drive due to its major arterial classification.
	Limited points of access from Main Campus due to steep terrain and existing development.
	Legal parcels owned by GEID, and City separate the West Campus Lands and Main Campus, requiring easements or land acquisition to enable connectivity.
	Conflicts/constraints for future road development related to environmentally sensitive areas, agricultural capability, and potential archaeological sites.

1.3.2 TOPOGRAPHY

The current West Campus Lands elevations range from 435 meters to 475 meters above sea level. As shown in Figure 12, there are steeper slopes along the north-east perimeter of the site with a gradual reduction of slope down towards the southwest and Robert Lake. Additionally there is an area of localized steep slope in Lot B & C.

The agricultural capability assessment of the West Campus Lands, (included in Appendix 2 of the Existing Conditions Report), identified that these elevations and slope angles are not limiting to agriculture. In addition, the general southwest to west facing aspect of the landscape, in combination with the climatic characteristics of the Okanagan Very Dry Hot Ponderosa Pine (PP) bio-geoclimatic zone, allows for maximum sun exposure and optimal growing conditions.

The steeper slopes on the eastern perimeter will affect the Conceptual Structure Plan in the following ways:

- The area is subject to height restrictions due to the proximity of the airport.
- The design must consider the guidelines of the Hazardous Conditions DPA as outlined in Section.
- Connections to the Main Campus are challenging due to the sloped terrain.



FIGURE 12: Lot 1 looking south.

Source: Kasian

FIGURE 13: Lot 1 eastern perimeter.

Source: Kasian

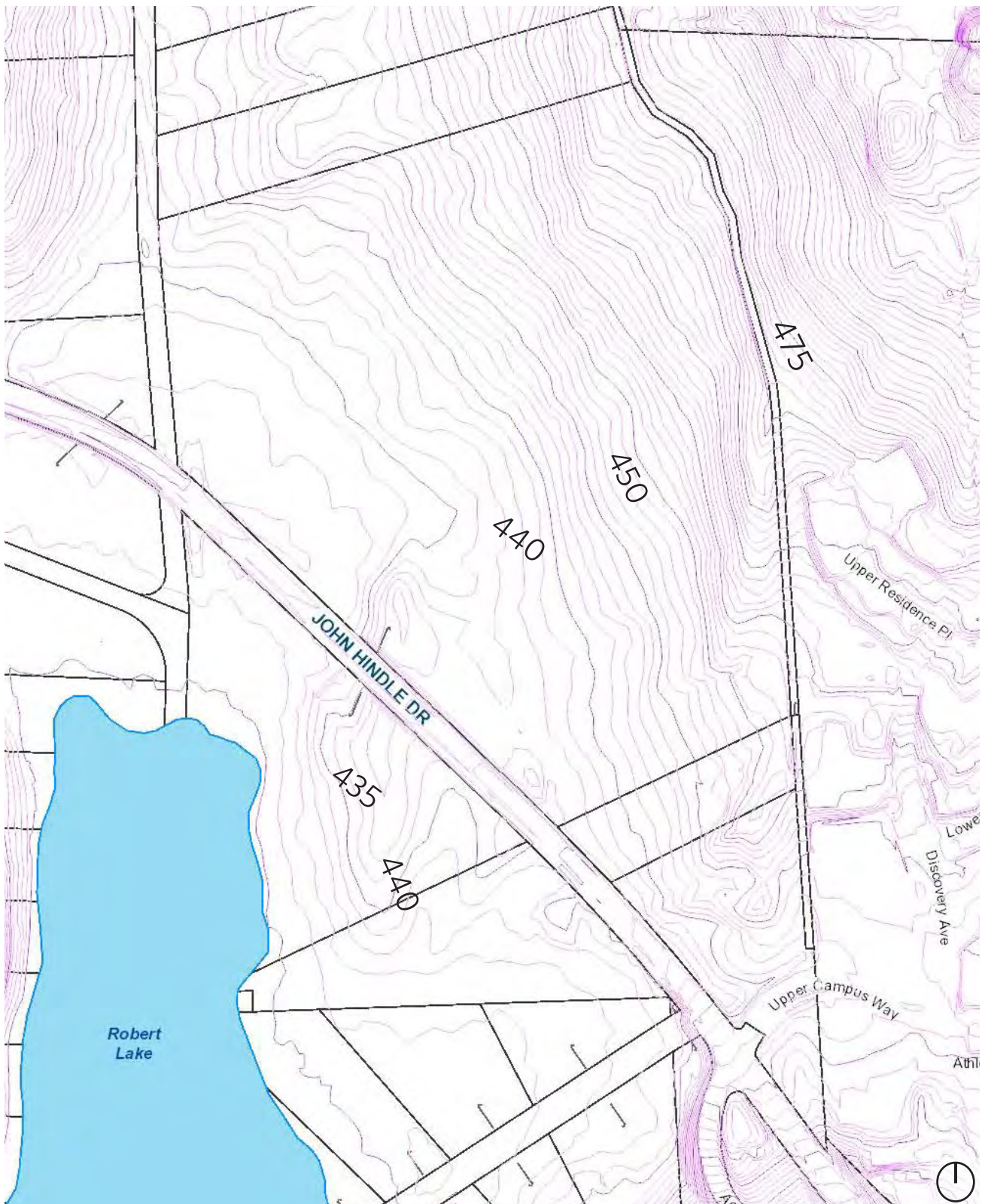


FIGURE 14: West Campus Lands Topographical Map.
Source: City of Kelowna OCP 2040 Map Viewer

1.3.3 ENVIRONMENTAL SENSITIVITY

Ecoscape Environmental Consultants performed an environmental review of the existing conditions of West Campus Lands which was included in Appendix 1 of the Existing Conditions Report. The report identifies four ecosystems within the West Campus Lands:

AQUATIC RESOURCES AND TRANSITIONAL ECOSYSTEMS

Located in and around Robert Lake at the south-west of the site, the area is described as a transitional saline meadow with an alkali lake at the center. It is considered a unique and sensitive ecosystem, and contains two red-listed herbaceous ecosystem communities. This ecosystem also supports a variety of vertebrate and invertebrate wildlife, including over 216 species of birds. Additional detailed surveys will be required to identify the presence of any specific protected plants or wildlife which are potentially supported by this type of ecosystem.

CONIFEROUS WOODLAND

Located on the north-eastern perimeter of the site, the area is characterized by an overstory of young stands of Ponderosa pine and interior Douglas fir with an understory of mixed native species as well as invasive species (on the perimeter and in disturbed areas).

CULTIVATED FIELDS AND ORCHARD

This is the primary ecosystem on the site, and includes a significant area of grass crop production and a small untended orchard.

URBAN AND RURAL COMMUNITIES

Primarily located at the south of the site, these are developed areas including university buildings Plant Growth Facility, private residences, and disturbed fields that are not actively farmed. These areas are generally characterized by roads, a disturbed understory, manicured landscaping and non-native and invasive species.



FIGURE 15: Lot 1 looking west at Robert Lake.
Source: Kasian

FIGURE 16: Lot 1 Coniferous Woodland.
Source: Kasian

FIGURE 17: Lot B/C looking east from John Hindle Drive.
Source: Kasian

Within these ecosystems, Environmentally Sensitive Areas (ESA) were identified based on ecosystem characteristics and wildlife habitat suitability as shown in Figure 17 right. The analysis recommends that development of the West Campus Lands should be focused in lower environmental sensitivity areas (ESA 3 and 4), and largely avoid areas of higher sensitivity (ESA 1 and 2). Furthermore, it is recommended that restoration and enhancement of the Robert Lake ecosystems should be considered, and should include a 30m setback from the lake for any development.

The table below is summary of key environmental opportunities and challenges excerpted from the Existing Conditions Report:



FIGURE 17 (RIGHT): Environmental Sensitivity.

Source: UBCO West Campus Lands Summary of Existing Conditions
Nov 2021, prepared by: Ecoscape Environmental Consultants Ltd.

Environmental	
Opportunities	Challenges
Majority of lands have a Moderate to Low Environmental sensitivity where future development can be focussed	Robert Lake is highly susceptible to disturbance/degradation - proposed development should be set back at least 30m from the High value saline meadow ecosystems
Sensitive terrestrial and aquatic ecosystems including a rare alkali lake, saline meadow, and coniferous woodland are environmental highlights that can be protected and integrated into planned development	There is existing stormwater diversion from John Hindle Drive to Robert Lake, limiting the capacity for more stormwater from the planned development
Robert Lake is a rare alkaline ecosystem that supports species at risk. The clay soil and low-lying conditions of the cultivated fields surrounding Robert Lake are ideal for additional wetland development or expansion of the Robert Lake ecosystems	John Hindle Drive bisects one of the High value (ESA 2) ecosystems associated with Robert Lake. It is a movement barrier for wildlife and a source of noise and stormwater to Robert Lake
There is an opportunity to enhance ecological connectivity between Robert Lake and the coniferous woodland	Non-native and invasive plant species associated with agricultural/urban/rural communities are encroaching into adjacent woodland and Robert Lake ecosystems
Robert Lake is a biodiversity hotspot, with 216+ species of birds documented.	Restoration as a "trade-off" to capitalize on agriculture capability while enhancing environmental protection

1.3.4 AGRICULTURAL CAPABILITY

Ecospace Environmental Consultants prepared an Agricultural Capability Assessment for the West Campus Lands that is included as an appendix to the Existing Conditions Report. Three main landscape elements (groups of soils with similar properties) were identified on site and rated for their agricultural capability (shown in Figure 18):

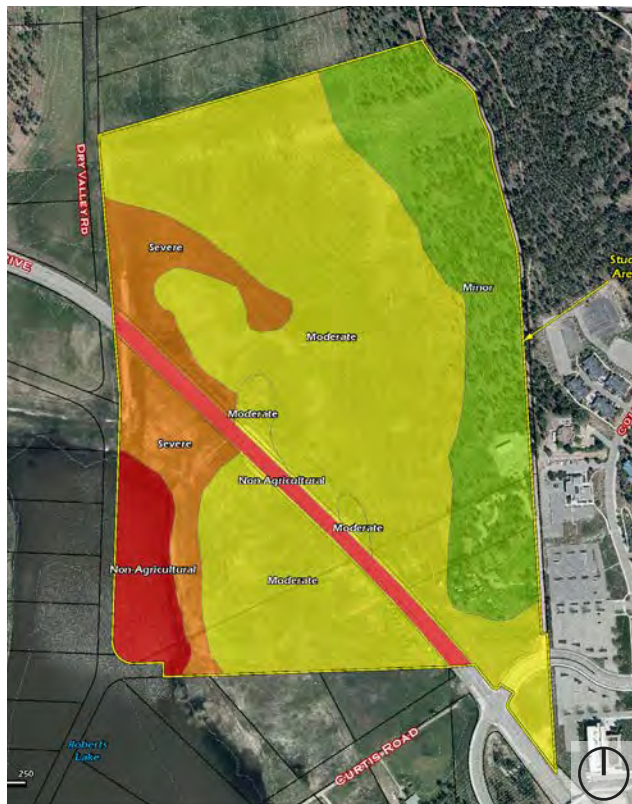


FIGURE 18: Agricultural Capability Map.
Source: Agricultural Capability Assessment: UBCO West Campus Lands, Nov 2021 prepared by Ecospace Environmental Consultants Ltd

CLAY-RICH GLACIOLACUSTRINE SEDIMENTS

These dense soils, which underlay over half the site, place moderate restrictions on agricultural production. They are well suited to irrigated perennial forage production, but are challenging for many perennial horticultural crops.

GLACIOFLUVIAL GRAVELLY SANDY LOAM

These soils are located along the north-eastern perimeter of the site, associated with the coniferous woodland ecosystem. The combination of the stoniness of the soil and the slope of the landscape place minor restrictions on agricultural production. These soils can support woody perennial horticultural crops like tree fruits, blueberries, or grape vines.

WETLAND

These soils on the south-western side of the site are poorly drained, often saturated, have high pH levels and are affected by the fluctuating levels of Robert Lake. There are severe limitations on agricultural production and they are best suited for non agricultural uses.

The table below is summary of key agricultural capability opportunities and challenges excerpted from the Existing Conditions Report:

Agricultural Capability	
Opportunities	Challenges
Contrasting landscape elements (soil groupings) provide opportunity to understand soil and plant interactions and how they compare under very different soil conditions	Area around Robert Lake very wet and extremely high alkalinity which is limiting to most crop types.
Agroecological opportunities - biodiversity & farming, agroforestry, natural buffers, integrated farming, farming with wetlands	Clay rich conditions limiting for some wood perennial horticultural crops
Sandy glaciofluvial landscape element best suited to horticultural research	Conflicting options for the sandy glaciofluvial landscape element between environment, agriculture and development.

1.3.5 ARCHEOLOGICAL POTENTIAL

Ursus Heritage Consulting performed an Archeological Overview Assessment (AOA) of the West Campus Lands that is included as Appendix 3 to the Existing Conditions Report. The assessment identified a new archaeological site and clarified five sites of archaeological potential as shown in Figure 19. These areas of potential will need further study, through an Archeological Impact Assessment (AIA), prior to any development proceeding in these zones.

The table below is summary of key archaeological opportunities and challenges excerpted from the Existing Conditions Report:



FIGURE 19: AOP/PFR Location Map.

Source: AOA/PFR for UBCO West Campus Lands, Kelowna, B.C., prepared by: Ursus Heritage Consulting

Archaeology	
Opportunities	Challenges
If confirmed, potential to share/celebrate archeological findings with local First Nations	Requirement for AIA and Permit approvals could add to timing
Potential archeological significant sites could provide opportunities for reconciliation and indigenous research and learning	Potential archeological significance could limit/prevent opportunities for future development within those sites and the surrounding area

1.3.6 INFRASTRUCTURE & SERVICING

Key Regulations:

Infrastructure development in the West Campus Lands is subject to City of Kelowna Official Community Plan (OCP) OCP and the regulations of the Agricultural Land Commission (ALC) which may limit or even prohibit using the land for anything beyond agriculture and farming activities. Limits or restrictions may be placed on municipal infrastructure and associated statutory rights of way even if it may be required for agricultural or urban development. For infrastructure development, UBCO can make a Non-Farm Use application to the ALC if the development provides a net benefit to agricultural use of the land.

The location of services is subject to the approval and regulations of the City of Kelowna:

- The servicing of the existing four lots must be from the lot frontage of each along John Hindle Drive.
- Any proposed infrastructure that crosses multiple legal parcels would require easements or legal agreements with the City or GEID which is not preferred by the City. This would need to be reviewed with the City to determine their willingness to accept this approach early in the detailed design phase.
- All infrastructure design must adhere to the bylaws and policies of the City and requirements for connection to the existing City infrastructure systems.

The table below is summary of key infrastructure and servicing opportunities and challenges excerpted from the Existing Conditions Report:

Infrastructure & Servicing	
Opportunities	Challenges
Water service connections available on site	ALC and City approvals required for infrastructure including new SRW's
Shallow utilities available on John Hindle Drive	Heavy clay soils not suitable for stormwater infiltration / detention and pre-treatment required
3-Phase electrical servicing conduits available on John Hindle Drive	No nearby sanitary servicing or planned service expansion
	City would generally not permit servicing across separate legal parcels / easements and other legal methods would need to be discussed with the City.

STORMWATER

In 2002, the City completed a North Kelowna Area Drainage Plan Study. This report contains a detailed analysis of the Robert Lake Basin and confirms the West Campus Lands drain into Robert Lake.

As shown on Figure 21 below, the northern section of the West Campus Lands drains through an informal swale/wetland on the north side of the John Hindle Drive, which diverts water into a culvert below the road. This culvert then feeds into an open ditch and storm pipe in a statutory right of way that leads to Robert Lake. Additional culverts were identified by Urban Systems (see Appendix C), locating a total of five culverts crossing John Hindle Drive and ultimately draining into Robert Lake. This stormwater is not treated prior to entering the lake.

Stormwater runoff is of particular concern given the sensitive and unique ecosystem of Robert Lake. Stormwater could affect the alkalinity of Robert Lake and therefore the Existing Conditions Report identified that mitigation should be prioritized for the area. The City of Kelowna bylaws identify that, due to the clay soil composition of the West Campus Lands, the area is not suited to stormwater infiltration, as required by UBCO's Integrated Rainwater Management Plan. Stormwater management plans for the site will need to consider detention to manage the flow volumes into Robert Lake as well as treatment. The Existing Conditions Report identifies constructed wetland(s) as an option to be considered, subject to a detailed review by environmental specialists to determine the required treatment levels.

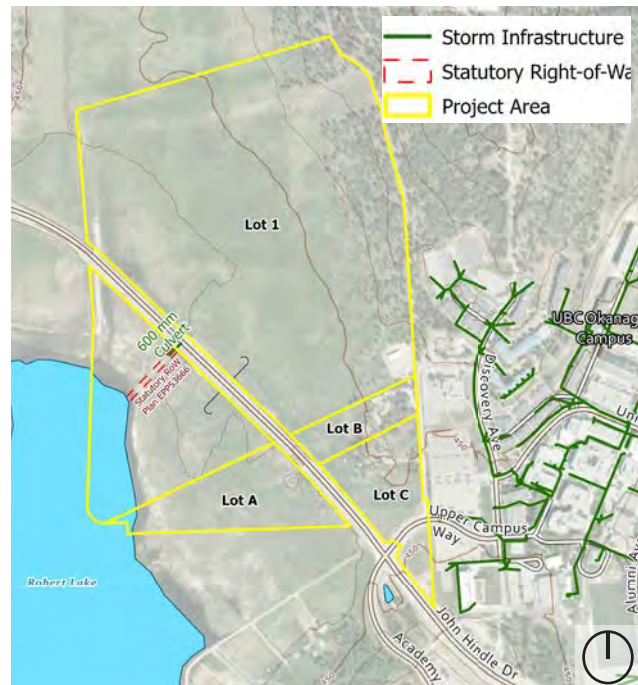


FIGURE 20: Existing Storm Infrastructure.
Source: UBC Okanagan West Campus Lands Existing Conditions Analysis January 2022, prepared by: CTQ



FIGURE 21: Existing Culverts crossing John Hindle Drive.
Source: West Campus Planning – Existing Stormwater Infrastructure Analysis, August 2022 prepared by: Urban Systems

WATER

There is currently water service to the West Campus Lands generally supplied from a water main that runs north of John Hindle Drive in a statutory right of way. The only exception to this is the Plant Growth Facility which is fed from the Main Campus through a registered easement across the GEID parcel that separates the facility from the Main Campus.

Future water services to support the development of the West Campus Lands can be provided through the water main north of John Hindle Drive or through additional water infrastructure that runs just beyond the eastern perimeter of the site which feeds the reservoir to the north and separately serves the Academy Way area.



FIGURE 22: Existing Water Infrastructure.

Source: UBC Okanagan West Campus Lands Existing Conditions Analysis January 2022, prepared by: CTQ

SANITARY

There is currently no sanitary servicing inside the West Campus Lands and the City of Kelowna has not identified any planned expansion of sanitary services to the area in the 2040 OCP. Any major development will require sewage to be pumped by a public sanitary lift station into the existing City of Kelowna sanitary sewer system, with connection to the existing system at either of the two closest trunk mains: at Glenmore/John Hindle Drive, or at Hwy 97 which feeds the Main Campus.

For minor developments, such as small greenhouses, the city, Interior Health and the ALC may approve the option of a septic system rather than sewer system. This option would require a septic system specialist to verify feasibility and confirm design approaches, such as raised septic fields due to the poor soil conditions.

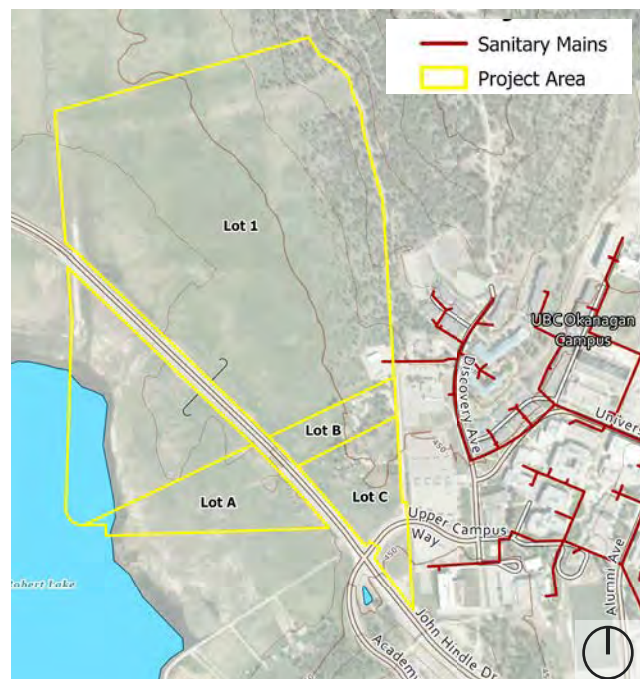


FIGURE 23: Existing Sanitary Infrastructure.

Source: UBC Okanagan West Campus Lands Existing Conditions Analysis January 2022, prepared by: CTQ

SHALLOW UTILITIES

Underground gas, electricity, and communication services are located along John Hindle Drive and can be connected to for future development services.

There is an existing three phase power supply at the intersection of Academy Way and John Hindle Drive which could be tied into to service future commercial and industrial type development which may require it.

FortisBC has an empty three phase duct along John Hindle Drive that can accommodate a high capacity cable to service large loads in the West Campus Lands if required.

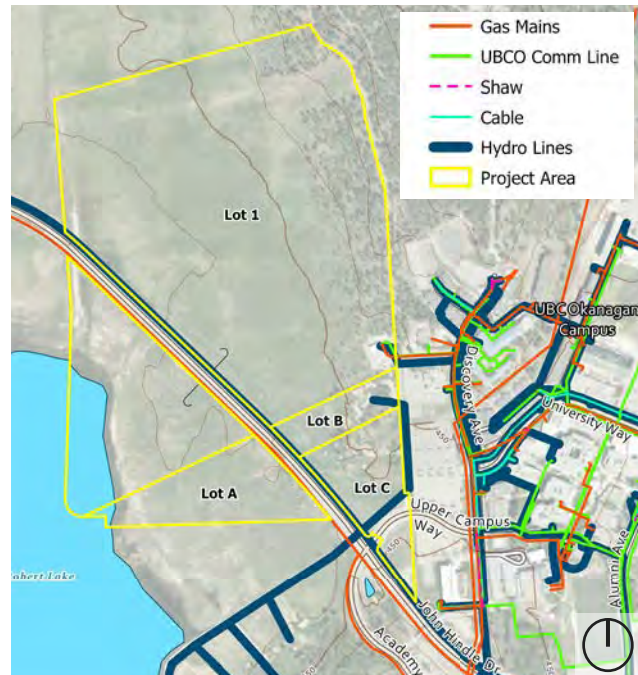


FIGURE 24: Existing Shallow Utilities Infrastructure.
Source: UBC Okanagan West Campus Lands Existing Conditions Analysis January 2022, prepared by: CTQ

GEOHERMAL (DISTRICT ENERGY)

UBCO's District Energy System (DES) and Central Heating Plant System (CHP) that serve the Main Campus were not designed to serve the West Campus Lands.

Once the project moves to detailed design, after the Conceptual Structure Plan is complete, a design specialist could be retained to evaluate the feasibility of extending the systems based on the proposed development.

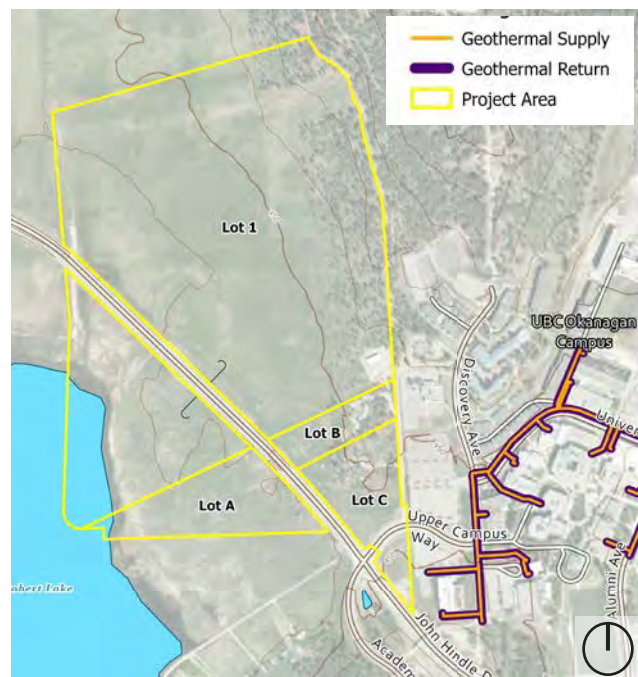


FIGURE 25: Geothermal Infrastructure.
Source: UBC Okanagan West Campus Lands Existing Conditions Analysis January 2022, prepared by: CTQ