

REPORT

City of Kelowna

Agricultural Impact Assessment
Serwa Lands



FEBRUARY 2020

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EXECUTIVE SUMMARY

The City of Kelowna is growing and requires additional transit systems and facilities to move people in environmentally responsible ways, planning to both accommodate growth and preserve agriculture. The City has explored numerous options to accommodate a new transit facility and, based on historical considerations and feasibility, has selected a site located in the Agricultural Land Reserve (ALR). The City is proposing exclusion of the site from the ALR with efforts to mitigate overall impacts on agricultural production in the City to compensate for the exclusion. To fulfill ALR exclusion application requirements, an assessment of agricultural effects and development of mitigation measures for offsetting any negative effects on agriculture are required.

This Agricultural Impact Assessment (AIA) is a review of the proposed facility land and the impacts of the land development as industrial use, as well as a review of the broader area to outline the effective approach to City agricultural planning. The area proposed for exclusion from the ALR is 40 acres (16.2 ha; including access) and currently vacant. The area was previously used for hay production but has been identified by the ALC as an isolated site that is compromised for long-term agriculture because of the UBC Okanagan expansion to the north (Provincial Agricultural Land Commission 1995). The land has minor agricultural capability limitations related to drainage and aridity. The impetus for the exclusion is to accommodate a facility that is not feasible in other areas. The City has reviewed all options at existing transit sites and other industrial sites, and the exclusion cannot be avoided based on the facility design and location. According to the City of Kelowna's Agricultural Plan (2017), approximately 38% (8,600 ha) of the City of Kelowna land area is within the ALR.

The City plans to offset these effects by expanding use and improving production on ALR and non-ALR land in the City boundaries. This will be through soil salvage and placement on existing parcels, and leasing City agricultural property to Young Agrarians and other farmers. Affordable leases of agricultural land promote local farming by acting as incubator farms, i.e. new farmers learning farming practices with reduced financial investment and building capital towards their own land or larger-scale farming.

By expanding the available transit and to facilitate commuter use of transit, the City is working towards reducing traffic congestion on key local and regional transportation corridors. Congestion leads to the need or demand for more and wider roads, which has future potential to impact more viable agricultural land in other areas of the City.

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1 INTRODUCTION

Associated Environmental Consultants Inc. (Associated) was retained by the City of Kelowna (the City) to complete an Agricultural Impact Assessment (AIA) for a proposed transit maintenance and operations facility, and associated access. The facility is proposed to be located in the Agricultural Land Reserve (ALR), which is a portion of the Serwa Properties at 4690 Highway 97 North (Rem NW 1/4 Sec. 2 TP 23 and Rem. SW 1/4 Sec. 11 TP 23; PID 007-399-766 and 007-399-871; Figure 1-1). From a Provincial regulatory perspective, the City must apply for an exclusion from the ALR through the Agricultural Land Commission (ALC). To fulfill ALR exclusion application requirements, an assessment of agricultural effects as well as mitigation measures for offsetting any negative effects on agriculture are required for projects of this scale. The Agricultural Impact Assessment (AIA) will be used to support an application to the ALC for exclusion of the lands. The entire property is also within the City of Kelowna's Farm Protection Development Permit Area. This requires a Development Permit application to include an AIA. This AIA was completed following the City of Kelowna Agricultural Impact Assessment Terms of Reference published by the City of Kelowna (Appendix A) and the Agricultural Land Commission Act (S.B.C. 2002, c. 36).

1.1 Background Information

There have been discussions about the Serwa Property between the ALC and the City in the past. In 1994 the two parties had a workshop to gain ALC input on an Official Community Plan, and the Serwa Property was discussed (previously Western Canadian Ranching Company Lands, referred to as the "ALR block"). The ALC noted that the 67 hectares of farmable area was seriously compromised for long-term agriculture when the ALC consented to the UBC Okanagan campus development to the north. "The [ALR] block is isolated, so that its exclusion would not be a precedent to other exclusions." They also note that if agriculture is abandoned, the block has potential for more than residential use. For example, playfields could be developed or some parts of the site to industrial development. In the letter response, the ALC consents to the proposed "Concept Development Plan" that designated the Serwa Property for a broad range of uses in the 1994 Official Community Plan, and "specifically encourages uses [of the ALR block] that might otherwise be targeted to productive farmland in the ALR" (Provincial Agricultural Land Commission 1995).

The City plans to expand its public transit network and capacity, with a goal to increase ridership from 4.3 million rides to 16 million rides by 2035. This expansion is to accommodate the projected growth of the City, while reducing road congestion (see Appendix B Potential Future Transportation Network by Associated Engineering 2019). For the City's transit network to expand, a new primary operations and maintenance facility is required (the Project). The existing operation and maintenance facility is beyond capacity, housing 95 or more vehicles on average, when it is intended to hold no more than 70. Due to lack of facility space, many of these vehicles are stored on public right-of-way. The exclusion area has been identified as the most suitable option for the proposed transit operation and maintenance facility based a comprehensive search of potential properties (City-owned and private) by the City's Real Estate Department. Parameters considered include cost, location, property size, and future expansion capability. Expansion of the current facility is not considered feasible and no other viable locations were identified. The Serwa Property was broadly part of the City's infrastructure development planning since OCP planning in the 1990s, and input from the ALC in 1995. In their letter the ALC states that playfields may be suitable for development or some parts of the site for industrial development (Provincial Agricultural Land Commission 1995).

The objective of the AIA is to evaluate the effects of the Project on agricultural lands within and surrounding the Serwa Property, and to identify mitigation options. The assessment includes a high-level review of cumulative effects on agricultural land use in the City of Kelowna. This report provides a summary of the baseline information and an

overview the potential effects on agriculture as a result of ALR exclusion and facility development, the mitigation measures to minimize effects on agriculture, and any residual and cumulative effects.

1.2 Agricultural Impact Assessment Objectives

The requirements for completing an AIA in Kelowna are outlined in the City of Kelowna's Agricultural Impact Assessment Terms of Reference (TOR, Appendix A). The TOR is intended as a general guide for conducting AIAs in the City of Kelowna and does not provide a comprehensive list of requirements. The TOR advises the Qualified Professional completing the AIA to work with City staff to review and confirm a site-specific TOR prior to commencing work. In September 2019, Associated consulted with City staff to discuss AIA requirements. Based on discussions and the TOR, the AIA should:

- Summarize the baseline agricultural conditions;
- Assess the potential effects of the exclusion on agricultural resources in the vicinity;
- Develop a mitigation strategy to avoid or reduce any detrimental effects;
- Determine any residual effects that cannot be reasonably mitigated;
- Identify any cumulative effects of the exclusion; and
- Identify alternatives to the exclusion.

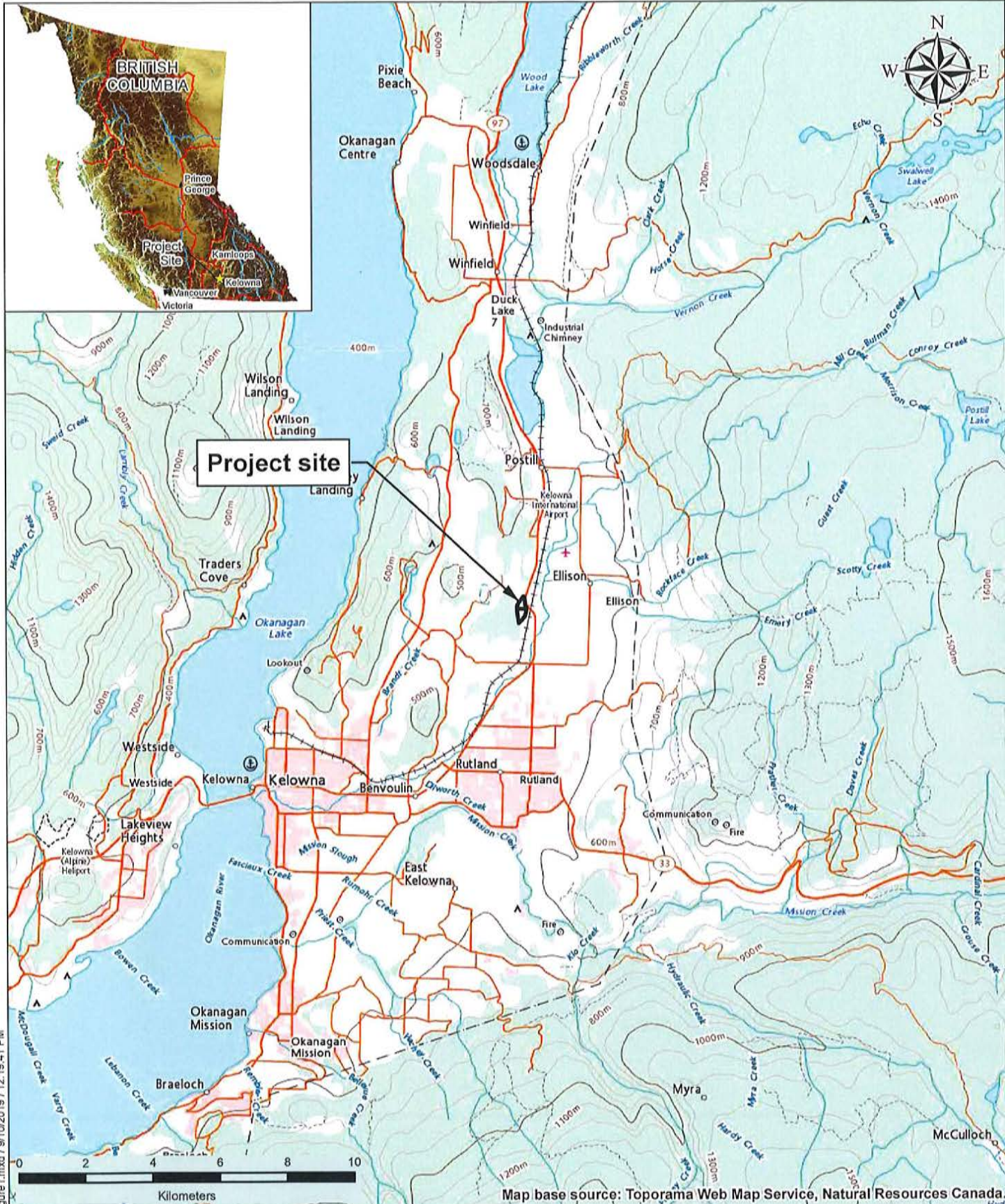


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Map base source: Toporama Web Map Service, Natural Resources Canada.

FIGURE 1: LOCATION PLAN



PROJECT NO.: 2019-8444
 DATE: September 2019
 DRAWN BY: BdJ

City of Kelowna
 Agricultural Impact Assessment for Serwa Lands

2 METHODS

The methods used to complete the AIA were based on the City of Kelowna Agricultural Impact Assessment TOR (Appendix A), which included the following tasks:

- Review of existing information, including: aerial photographs; soil and land capability maps and reports; City of Kelowna Official Community Plan; City of Kelowna Agricultural Plan; Facts in Focus – 2018 Agricultural and Rural Areas Summary; land use maps and reports; survey and engineering drawings; and agricultural statistics;
- A site visit conducted by Melanie Piorecky, P.Ag. and Megan Ludwig, M.Sc., A.Ag. on September 26, 2019 to verify mapping and gain a better understanding of the propose exclusion area;
- Meetings with City of Kelowna project manager, Graham Hood, planning manager, Laura Bentley, and planning manager, Dean Strachan to discuss the approach to the AIA, potential effects, and mitigation measures;
- Assessment of potential Project effects on agricultural;
- Development of mitigation measures to offset potential effects; and
- Preparation of this report.

An additional site investigation was completed on November 7, 2019, by Megan Ludwig, M.Sc., Soil Scientist with Associated. The second site investigation was to review the soil characteristics for salvageability. This entailed sampling in a grid formation across the entire property, advancing auger test pits every 100m. If a change in soil was observed, then Ms. Ludwig stepped out 3m from the auger hole until the transition was defined. The soil was textured and composite samples taken of areas with suitable characteristics for agricultural use (i.e. not clay). The different soil textures were delineated with a GPS. The samples were submitted to Pacific Soil Analysis Inc. for detailed fertility analysis.

3 EXCLUSION AREA

The proposed exclusion area is located within the ALR on the Serwa Property to the west of Highway 97 in Kelowna, approximately 10 km northeast of downtown and at an elevation of 415 metres above sea level (masl). The Serwa Property is two parcels totalling 57 ha (141 acres). The proposed exclusion area is 16.2 hectares (40 acres; Figure 3-1), which would be for a transit Maintenance and Operations Facility and associated access roads. A portion of the area remaining on the Serwa Property will be left, but potential use is to be determined.

The assessment of cumulative effects on agricultural land focussed on the whole of the City of Kelowna. A wider regional area was also considered, which includes the Central Okanagan.

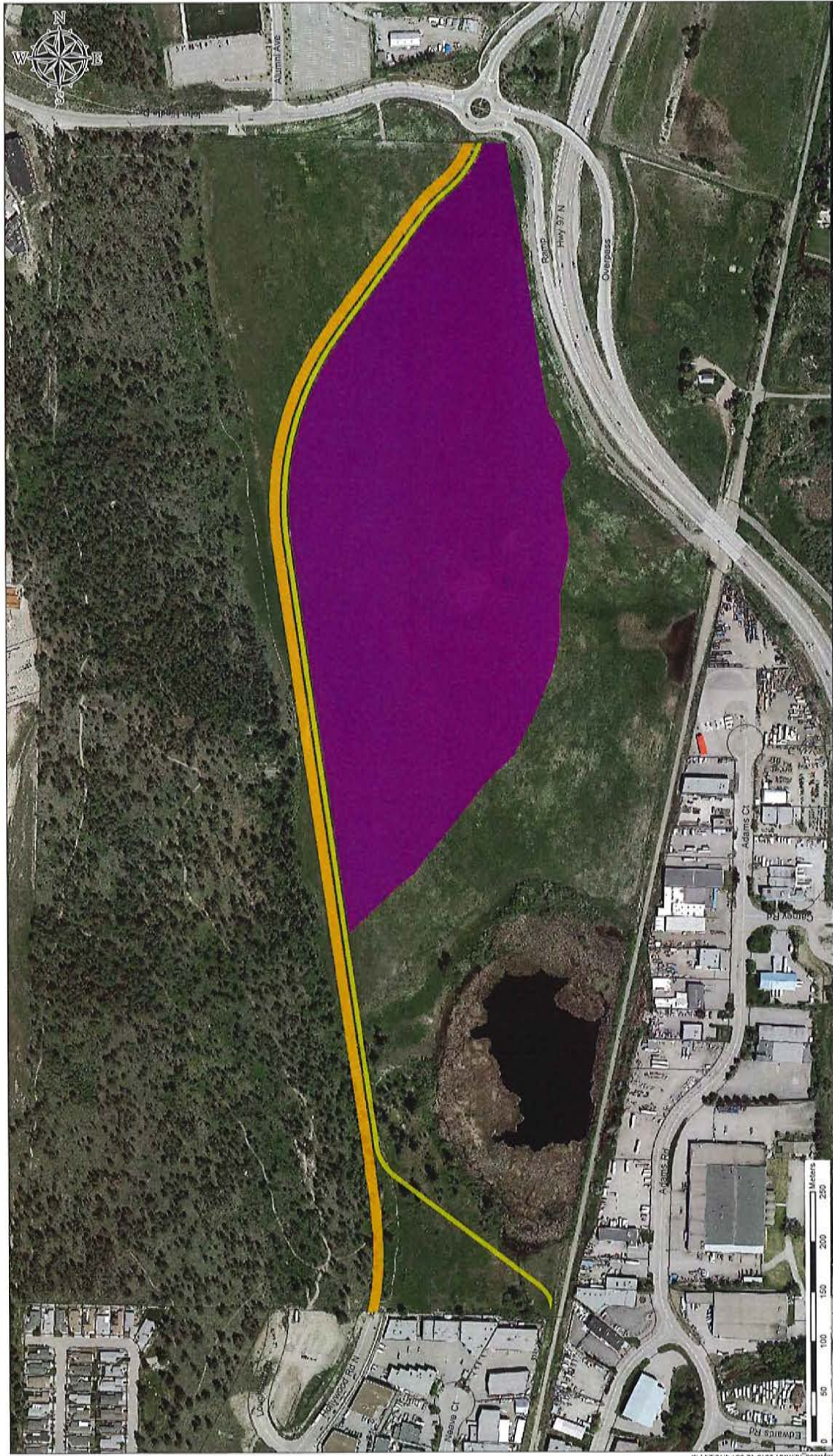


FIGURE 3-1: PROPOSED EXCLUSION AREA

PROJECT NO.: 2019-8444
 DATE: December 2019
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City of Kelowna
 Agricultural Impact Assessment for Serwa Lands

Impact Areas

- Exclusion Area (14.3 ha.)
- Hollywood Road (1.3 ha.)
- Multi-use pathway (0.6 ha.)

Associated Environmental

AE

4 BASELINE CONDITIONS

Following the TOR and discussions, the AIA outlines the existing agricultural conditions in the exclusion area and the Property, specifically of the following:

- Land use
- Agricultural land use and zoning
- Agricultural socio-economic profile
- Climate
- Soil mapping
- Land capability for agriculture
- Drainage, irrigation and water quality
- Farm access and transportation
- Farm infrastructure (farming)

4.1 Land Use

The Serwa Property was purchased by the City of Kelowna in 2017. It comprises vacant parcels that were previously used to produce hay, as well as Carney Pond and surrounding wetland areas. None of the parcels are currently cultivated or used for grazing. The Property is partially fenced, with access from the north along John Hindle Drive. The Property is bordered by a mix of agricultural, commercial, wildlands, and urban areas. Adjacent land use includes:

- North – UBC Okanagan
- West – undeveloped lands
- South – industrial land
- East – Okanagan Rail Trail, commercial land, and forage pasture

Surrounding land use (not directly adjacent) includes residences for UBC Okanagan, single family homes and lots, and agriculture. Agricultural lands in the immediate area are typically small rural residential properties with hobby farms. Large, more extensive agricultural holdings are located southeast of the Property.

4.2 Agricultural Land Reserve and Zoning

The ALR is a provincial zone in which agriculture is recognized as the priority use, where farming is encouraged and non-agricultural uses are controlled. According to the City of Kelowna's Agricultural Plan (2017), approximately 38% (8,600 ha) of the City of Kelowna land area is within the ALR. The proposed exclusion area amounts to less than 0.2% of the total ALR land within the City.

The proposed exclusion area is zoned by the City as A1 Agricultural. A1 zoning allows general agricultural uses; however, not all land in this zone is actively used for agricultural purposes. Areas zoned as A1 have a minimum parcel size of 9.9 acres (4 ha) under the City of Kelowna Zoning Bylaw 8000. Approximately 55% of the city is zoned for agriculture-A1 (City of Kelowna 2017).

4.3 Agricultural Socio-Economic Profile

The soil, topography, and warm climate in the Okanagan Valley make the Central Okanagan one of the most important agricultural centres in the province. In 2016, the total gross farm receipts for the Central Okanagan was \$120 million

with a total gross income of \$100 million (Statistics Canada 2016). Total gross farm receipts increased by approximately 24% between 2011 and 2016. This is primarily due to the growth of the wine industry and cherry exports, as well as the Okanagan's reputation as a world class agri-tourism destination.

Approximately 23,000 ha is farmed in the Central Okanagan (Statistics Canada 2016). Farms in the region produce a variety of crops with apples, cherries, and grapes among the most important commercial crops. Fruits, particularly cherries, are important agricultural exports that provide significant contributions to the agricultural economy in BC.

However, significant population growth and urbanization throughout the Central Okanagan is contributing to increased pressure on agricultural land and availability of water for irrigation. In turn, the increased pressure to urbanize agricultural land is contributing to high land costs, which can act as a deterrent to prospective entrants into the farming industry and long-time farmers from staying in farming. One of the City's main objectives is to protect and enhance agriculture within city limits. Some of the ways the City plans to improve agriculture, as outlined in the Official Community Plan (OCP, City of Kelowna 2011), include:

- Increase the total area zoned as agricultural-rural from 8,592 ha in 2010 to 9,896 ha by 2030;
- Protect ALR land from development and not support exclusions, except in extreme cases;
- Limit development within a Permanent Growth Boundary as to not encroach on agricultural lands;
- Restrict non-farm use activities on agricultural lands that do not benefit surrounding agricultural uses;
- Support inclusions of lands into the ALR;
- Protect farm and farm operations and minimize the impact of urban encroachment, supported by recently adopted bylaws pertaining to farm protection.

4.4 Climate

The closest Environment Canada climate station to the exclusion area is the Kelowna A Station (Climate ID 1123970). This station is located at the Kelowna International Airport, 2 km north of the exclusion area, at an elevation of 430 masl. The climate in Kelowna is characterized by warm, dry summers and mild winters. The normal daily mean January temperatures are -0.2°C (maximum) and -7.4°C (minimum) and daily mean July temperatures are 27.6°C (maximum) and 10.5°C (minimum) (Environment Canada 2015). Mean annual precipitation is 380.5 mm, with 101.8 mm (water equivalent) falling as snow. However, these precipitation volumes are highly variable as a result of climate change implications. In the Okanagan, warmer overall temperatures (annual average temperature increases of 1.6°C by 2020s and 3.1°C by the 2050s) less summer precipitation (an average of 9% less seasonal summer precipitation by 2020s and 14% less by 2050s) is anticipated, which would exacerbate the shortage of water and crop demands (Okanagan Basin Water Board 2019).

Figure 4-1 shows the monthly normal precipitation compared to the estimated potential evapotranspiration (PET), as estimated using the Priestley-Taylor equation (Shuttleworth 1993). Between May and September, the region is characterized by a soil moisture deficit. Therefore, most agricultural operations in Kelowna rely heavily on irrigation during the summer.

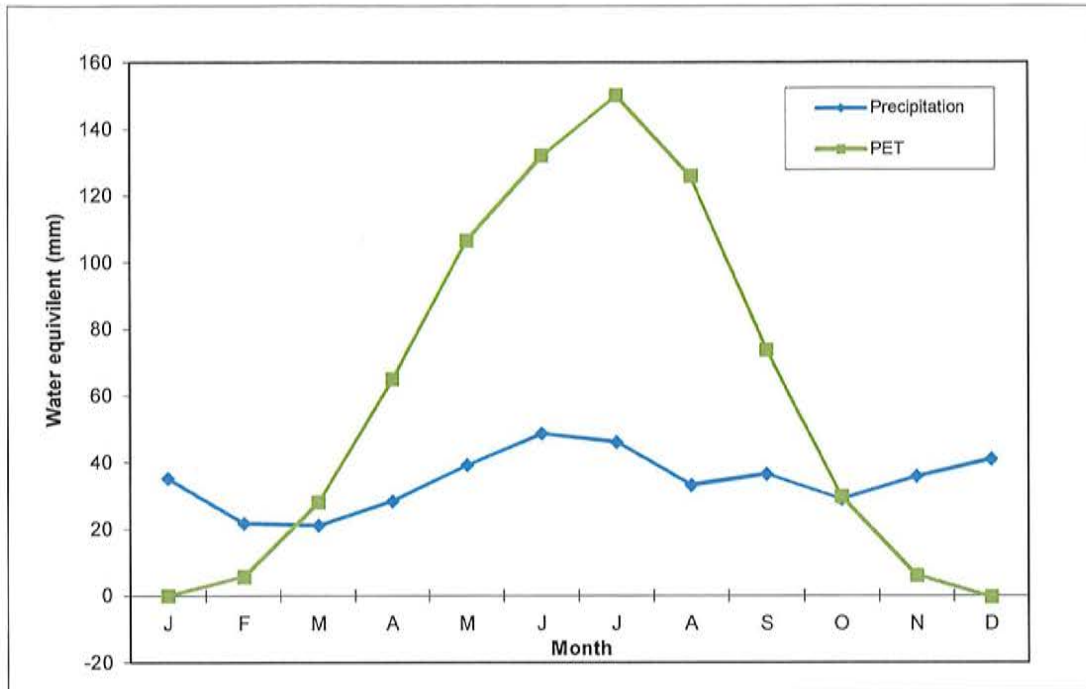


Figure 4-1 Precipitation and Potential Evapotranspiration (PET) at Kelowna International Airport

4.5 Soil Mapping

Soils in the exclusion area and on the Serwa Property have developed on a combination of glaciofluvial and glaciolacustrine surficial materials with a small amount of organic material. Published soil mapping indicates that two soil types (soil series) corresponding to these surficial materials occur in the exclusion area (Province of BC 2019). Soils are mostly composed of Westbank soil series, but also include a small amount of Trout Creek soil series (Table 4-1).

The mapped agricultural capability of the site and soils is described in detail in Section 4.6, and their value for salvage and use on other ALR land is reviewed in Section 6.2. Generally, Trout Creek and Westbank soil series limit crop growth due to their high erodibility and low organic matter content. Both soils series found on the Serwa properties are also described as being poorly drained, which is due to high clay content.

These soils and their locations were verified during the field investigation of the whole Serwa Property. The Westbank soils were classified as a heavy clay, somewhat different from the published mapping, and observed as heavily compacted and altered from previous farming efforts. There is a small area of loamy soils (Trout Creek) near Carney Pond, south of the proposed exclusion area. This is within the riparian setback of the pond (actual setback from pond to be determined based on City of Kelowna guidance).



Table 4-1 Soil Series within the Exclusion Area

Soil Series	Soil Material	Drainage	Classification	Soil Management Group	Approximate Area in Footprint (ha/%)
Westbank	Surface: silty clay loam, clay loam, and clay Subsoils: clay or heavy clay but may become sandy Parent material: fine to mod. fine glaciolacustrine deposits	Mod. well drained, slowly pervious, high water holding capacity	Orthic Gray Luvisol	Glenmore	14.9 / 91%
Trout Creek	Surface: sandy loam Subsoils: sandy or loamy sandy Parent material: coarse glaciofluvial deposits	Well drained, readily pervious, intermediate water holding capacity	Eluviated Eutric Brunisol	Skaha	1.3 / 9%

4.6 Land Capability for Agriculture

In BC, agricultural capability is rated through a classification system known as the Land Capability Classification for Agriculture in British Columbia (Kenk and Cotic 1983). The system describes seven land capability classes for agriculture (Class 1 to Class 7) and is consistent with the system of the Canadian Land Inventory. The highest classification soil (Class 1) has very slight limitations for agriculture; the lowest class (Class 7) has no capability for agriculture (Table 4-2). Along with these classes, the ALC assigns limitations to soils (Table 4-3). In most agricultural regions of BC, two ratings are assigned to a piece of land to reflect the current condition of soils and the condition after management improvements to limitations are implemented (ALC 2013). Improvements typically include drainage systems, irrigation, stone picking, and amendments.

Table 4-2 BC Land Capability Classes for Agriculture

Class	Description
Class 1	Land either has no or only very slight limitations that restrict its use for the production of common agricultural crops.
Class 2	Land has minor limitations that require good ongoing management practices or slightly restricts the range of crops, or both.
Class 3	Land has limitations that require moderately intensive management practices or moderately restricts the range of crops, or both.
Class 4	Land has limitations that require special management practices or severely restricts the range of crops, or both.
Class 5	Land has limitations that restrict its capability to producing perennial forage crops or other specially adapted crops.
Class 6	Land is non-arable but is capable of producing native and/or uncultivated perennial forage crops.
Class 7	Land has no capability for arable or sustained natural grazing.

Source: ALC 2013

Table 4-3 BC Land Capability Limitations to Agriculture

Symbol	Limitation	Major Improvement
W	Water	Drainage Systems
L	Permeability (organic soils)	Unimprovable
D	Soil Structure/permeability	Organic matter additions
N	Salinity	Unimprovable
I	Inundation	Diking
A	Moisture	Irrigation
F	Fertility	Fertilizer addition
T	Topography	Unimprovable

Source: ALC 2013

Based on the review of published agricultural capability and the field investigation, the proposed exclusion area is primarily improved Class 3, with a small portion of Class 6 (Table 4-4; Figure 4-2). The improved land capability is the appropriate indicator of land quality because most of the proposed exclusion area could be irrigated if proper infrastructure was available, and organic matter could be added to the soils to increase drainage. Soils are primarily limited by soil structure (D), but a small portion is also limited by the water table being present within the soil column (W).

Table 4-4 Mapped Agricultural Capability of Proposed Exclusion Area

Soil Type	Unimproved	Improved
Westbank	4AD	3D
Trout Creek	6WD	4WD

4.7 Drainage, Irrigation and Water Quality

The exclusion area is located within the Mill Creek watershed. The creek is approximately 36 km long and about two-thirds of the total watershed area is located north/upstream of the exclusion area. Mill Creek starts north of the Serwa Property boundaries, flowing through the Kelowna Airport to the northeast and into the eastern edge of the properties, across the highway from the exclusion area.

The western portion of the Property contains Carney Pond. A portion of the runoff on the property drains directly into Carney Pond, which overflows into a drainage channel that parallels the Rail Trail. This drainage channel ultimately drains into Mill Creek, south of the Property boundaries. The runoff not entering Carney Pond drains directly into the drainage channel.

Groundwater discharge is not an issue in the exclusion area but does occur in the east of the Property, across the highway. This area is a low valley, where the combination of groundwater discharge from the hillside and a high-water table creates drainage difficulties. Difficulties include seasonal flooding and inundation of the soils with water and have been detrimental to agricultural areas around Bulman Road, making them prone to seasonal flooding.

Within the exclusion area, the soils are a combination of well to poorly draining due to a combination of coarse and clay textures. Soils on the eastern portion of the Property, across the highway, are very poorly drained due to saturation from the water table.

Due to the soil moisture deficit between April and October, irrigation is required during the summer. There are currently no water licences issued to the property for irrigation use or irrigation infrastructure.

4.8 Farm Access and Transportation

The transit facility will be accessed by Hollywood Road North. The road will be extended from the southern portion of the Property, where it currently ends, to meet Highway 97 on the northeastern portion of the Property. Hollywood Road will be a two-lane arterial road maintained by the City. Pending approval for exclusion, the road is slated for completion in around 2030.

Until the completion of Hollywood Road, temporary access to the transit facility will be via John Hindle Drive, on the north end of the property. John Hindle Drive is a two-lane arterial road and is maintained by the City.

4.9 Farm Infrastructure (Fencing)

The entire perimeter of the Property has wooden fence posts, but in many places the wire is missing. There is a vehicle gate at the northern end of the Property, with access to John Hindle Drive. No other farm infrastructure is in place.

5 ASSESSMENT OF EFFECTS ON AGRICULTURE

The following effects were assessed as part of the AIA:

- Loss of agricultural land
- Loss of agricultural revenue
- Disruption of drainage, irrigation and water quality
- Farm access and transportation
- Compatibility and property speculation
- Severance or isolation
- Degradation of soils on agricultural land
- Temporary loss of infrastructure

5.1 Loss of Agricultural Land

The Project will result in a loss of 16 hectares of ALR land. The land that would be removed is predominantly rated as Class 4 unimproved land capability ratings, and Class 3 if improved (i.e., land has limitations that require moderately intensive management practices or moderately restricts the range of crops, or both).

No parcels within the proposed exclusion area are currently used for agricultural purposes, although they have been used to produce hay in the past. The City of Kelowna has indicated that these lands have not been farmed since the purchase in 2017.

Any loss of agricultural land is considered an adverse effect on agricultural use because of the importance of preserving high capability agricultural lands within the ALR. It is the mandate of both the City of Kelowna and the RDCO to preserve agricultural land in the ALR to support agricultural viability (City of Kelowna 2011). The ALC, along with municipal governments, generally discourage removal of land from the ALR unless there is a demonstrated net benefit to agriculture through compensation or improvements as a result of non-agricultural development in the ALR.

There will be loss of agricultural land. The mitigation measures to offset the loss of agricultural land are described in Section 6.1.

5.2 Loss of Agricultural Revenue

Where there is permanent land loss and/or soil degradation, farmers may experience lost or reduced revenue due to their smaller land base and/or lower crop yields. Although the exclusion area is no longer farmed, the area was previously farmed for hay; therefore, the area has a permanent loss of potential agricultural revenue. Based on available estimates for Canadian climates, no irrigation, and some soil water retention issues (i.e. clay soils), 100 bales of hay could be cropped from each acre of land. Assuming bales sell for between \$2.00 and \$4.50 each, there is an estimated yearly loss of approximately \$8,000 at minimum, if the land is not farmed (this does not account for capital costs for equipment or fertilizer costs). Due to the lack of irrigation infrastructure, only one annual hay crop is expected in the exclusion area.

There will be loss of agricultural revenue. The mitigation measures to offset the loss of agricultural revenue are described in Section 6.2.

5.3 Disruption of Drainage and Irrigation, and Water Quality Degradation

Development within the exclusion area has the potential to affect drainage in surrounding agricultural areas by disrupting drainage patterns (i.e., reducing infiltration and increasing surface runoff). This has the potential to incrementally increase flooding and saturated soils in adjacent, downslope agricultural areas, which can result in reduced yields, delayed planting in the spring, and harvesting problems. Any changes to drainage patterns or water quality due to development in the exclusion area are not expected to significantly increase flooding or saturated soil conditions, particularly if stormwater best management practices are implemented.

There is no anticipated disruption to existing irrigation from project construction and operation.

There is potential for Project impacts on drainage, irrigation and water quality, but not relative to other farming operations. The mitigation measures are best management practices, listed in Section 6.3.

5.4 Farm Access and Transportation

With the new facility, traffic in the area is expected to increase due to the increase in employee and transit vehicles. This is not anticipated to affect farming access because facility traffic will use main roads and will not block or change access.

There will be no impacts on farm access or transportation to nearby farmed areas; therefore, mitigation measures are not required. For the proposed exclusion area, access to the remaining farmable areas is to be determined and will be facilitated by the City.

5.5 Compatibility and Property Speculation

From an agricultural perspective, the Serwa Property has not been farmed in recent years, and in the meantime the UBC Okanagan campus and roads have expanded to the north and east of the site. There is no machinery storage area or infrastructure; therefore, farm equipment would need to be driven to the site as needed. This is possible but less compatible with the surrounding road use. In a 1995 report, the ALC noted that the farmable area on this property (formerly the Western Canadian Ranching Company Lands) was seriously compromised for long-term agriculture when the ALC consented to the UBC Okanagan campus development to the north. A transit facility is compatible with the busy UBC Okanagan campus and John Hindle Drive, and as discussed in Section 9, the location was only proposed after considerable review.

5.6 Severance or Isolation

The Serwa Property is not connected with other agricultural land, so the exclusion would not result in isolation of the area relative to other properties. "The [ALR] block is isolated, so that its exclusion would not be a precedent to other exclusions" (Provincial Agricultural Commission 1995). The proposed exclusion would isolate the pockets of agricultural land remaining on the Serwa Property. There would be a small area to the north west and larger areas to the east and south. The remaining areas equal approximately 41 ha, but a portion of this would be in the Carney Pond and riparian area. The pond cannot be altered to accommodate farming under the Water Sustainability Act and the riparian area would have regulatory and ecological implications.



5.7 Degradation of Soils on Agricultural Land

There are no plans to use adjacent agricultural lands as temporary work or laydown areas during Project construction, because there is adequate space for these activities within the proposed exclusion area (Figure 3-1). There will be no effects on agricultural soils outside the exclusion area. Within the exclusion area, topsoil will be stripped and stockpiled, and the subsoil will be graded to ensure appropriate drainage and limit impacts to the adjacent areas.

Degradation could occur from stripping and stockpiling. The mitigation measures to reduce the potential for degradation of agricultural soils are described in Section 6.4.

5.8 Temporary Loss of Farm Infrastructure (Fencing)

During construction, some of the remaining fences around the exclusion area may need to be removed. Because much of fencing does not have barbed wire anymore, and there are no agricultural lands adjacent to the exclusion area, removal of fencing will not negatively affect agriculture.

There will be no loss of farm infrastructure as the fencing is outside of the Project footprint and in disrepair. However, to offset impacts from the Project on agricultural land, mitigation measures could include installation of fencing on other properties, as described in Section 6.5.



6 MITIGATION STRATEGIES

The following mitigation measures are intended to offset and potentially reduce the effects on agriculture in the proposed exclusion area, as described in Section 5. Because the exclusion area would be completely out of agricultural production, the mitigation measures are to offset or compensate for effects. The effects and mitigation/offset strategies are summarized in Table 6-1.

Table 6-1 Potential effects and mitigation measures

Potential Effects	Mitigation/Offset Strategies
Loss of Agricultural Land	<ul style="list-style-type: none"> • Develop a Topsoil Management and Enhancement Plan to salvage topsoil and direct its use. • Salvage the topsoil that is acceptable by ALC standards for application to other properties in the ALR, or for improvement and sale by local soil producers (see Section 6.2). • Collaborate with the Young Agrarians to cultivate other City-owned properties.
Loss of Agricultural Revenue	<ul style="list-style-type: none"> • Improve the agricultural capability of ALR properties across the highway, and facilitate affordable leases for Young Agrarians and other entry farmers. • Fulfill the newly updated Agricultural Plan which highlights: <ul style="list-style-type: none"> • Ongoing action on compliance and enforcement, agricultural water infrastructure improvements and pricing to sustain agriculture. • Revised A1 zone to better align with ALC regulations and policies. • New OCP policies to strengthen protection of agricultural land.
Disruption of Drainage and Irrigation, Water Quality Degradation	<ul style="list-style-type: none"> • Develop and implement Stormwater Management Plan, Sediment and Erosion Control Plan, and Spill Management Plan • Limit water main construction to off-peak irrigation season
Compatibility and Property Speculation / Fencing	<ul style="list-style-type: none"> • Install/maintain fencing along perimeter of other agricultural properties that could benefit from fencing to keep farm animals in, or deer and people out.
Degradation of Soils on Agricultural Land	<ul style="list-style-type: none"> • Prohibit laydown or temporary work in agricultural zones • Implement erosion and sedimentation control during development • Implement Spill Management Plan

6.1 Loss of Agricultural Land

Agricultural land loss is typically compensated for by adding the same amount of similar or better capacity land into the ALR or improving existing agricultural land. These are both proposed here: lands to be improved to the east of Highway 97. But 1:1 compensation is considered challenging because of the lack of available suitable non-ALR land in Kelowna. Mitigation strategies address offsets to potential losses, including loss of agricultural revenue (Section 6.2); however, as the land is not currently farmed, no farm revenues are being generated.

The City of Kelowna is working to offset the losses of agricultural land and is currently working with the Kelowna Young Agrarians, a group of young and new ecological and organic farmers, to cultivate City-owned lands around

Kelowna. Three sites are currently being proposed to be leased to the Young Agrarians to compensate for the losses from the proposed exclusion:

- 1710 Stafford Road – The 2.4 ha parcel was previously used to grow dry alfalfa. The soils are mapped as Oyama soils, with an agricultural capability of 4A suggesting some limitations in crop production due to aridity (land capability definitions in Table 4-2). Oyama soils are well suited for agricultural crops and are limited only by low soil water and nutrient holding capacities (Wittneben 1986). The Young Agrarians are proposing to convert the land into a productive vegetable garden.
- 1751 Findlay Road – This 2.1 ha parcel is currently naturalized wildlands that could be cleared, tilled, and irrigated to grow crops. It is directly adjacent to 1710 Stafford Road, and is mapped as Oyama soils with an agricultural capability of 4A.
- A portion of the remainder of the Serwa Property parcels, east of Highway 97 on Bullman Road – This land could be used for grazing small livestock, as it is fenced and has hilly terrain.

The City of Kelowna is currently exploring leasing options and how to support the Young Agrarians to create viable agriculture on these lands. The Findlay and Stafford Road properties, totalling 4.5 ha, would benefit from soil and compost placement, and an irrigation source. These and the Bullman Road properties could be leased to the Young Agrarians at a low cost to function as incubator farms.

6.2 Topsoil Salvage

To further offset loss of agricultural land, topsoil will be salvaged in the exclusion area and used to enhance local soil on nearby agricultural lands. Salvaged topsoil would be directed to the compensation sites (1710 Stafford Road, 1751 Findlay Road) and other ALR land in the Central Okanagan. Topsoil from the exclusion area can be used to improve soil fertility on sites with shallow topsoil and poor nutrient status and to improve drainage by lowering the water table (in imperfectly drained areas), thereby increasing crop yields and revenue.

A detailed Topsoil Salvage and Enhancement Strategy can be developed to ensure that topsoils are used with the ALR to enhance low fertility soils. The strategy will include the following requirements:

- Handling of topsoils will be minimal to avoid potential soil degradation and should be delivered to agricultural lands as soon as possible (avoid stockpiling if possible).
- Gravelly and non-gravelly salvaged soils will be managed separately.
- Farmers in the vicinity of the exclusion area will be given priority over farmers in other agricultural areas of Kelowna.

Estimates of topsoil salvage volumes are based on the field investigation and soil mapping data. The majority of the soils on the Serwa properties are clay soils, which are considered poor for agricultural capability because of high clay content (ALC 2019). Potential salvage areas are limited to areas where the soils were identified as non-clay material. The total salvageable soil within the proposed exclusion area is approximately 4,800 m³ and does not include a 0.65 ha area of sandy material that was previously placed on the property (Table 6-2, Figure 6-1). The sandy area varies in depth from 3 to 6m deep based a side profile, with an estimated salvage volume of 20,000 m³. This material could be salvaged and used for building substrate or mixed in with the soils that have high clay content for better drainage.



Table 6-2 Soil Salvage Estimates

Soil Quality	Soil Texture	Total Area (Ha)	Area within footprint (ha)	Estimated Volume in footprint (m ³)
Good	Clay Loam, Sandy Clay Loam	0.62	0.4	1,600
Medium	Clay Loam, Sandy Clay	1.91	1.26	3,200
Poor	Clay	54.02	14.34	35,900

Fertility analysis was done on the soils that could potentially be salvaged (Appendix C). These soils are sandy clay loam and sandy clay and clay loam. They generally have low organic matter content and low nitrogen, moderate to low macro and micro nutrients. This will be appropriate for use on agricultural lands, provided it fertility is managed through addition of soil amendments and/or fertilizer.



FIGURE 6-1: SOIL SALVAGE MAPPING

City of Kelowna
Agricultural Impact Assessment for Serwa Lands

PROJECT NO.: 2019-8444
DATE: December 2019
DRAWN BY: BdJ

Soil salvage areas: Poor (Red), Good (Green), Medium (Yellow)

Exclusion area (White outline), Soil test pit (Black square), Stockpiled sand (Hatched pattern)

Scale: 0 to 250 Meters

Associated Environmental

soils_gird_mxd / 2019-12-05 / 4:14:10 PM

6.3 Loss of Agricultural Revenue

Economic losses can be partly mitigated or offset by improving the agricultural productivity and/or viability of existing farm parcels that are currently underutilized. This includes salvaging topsoil from permanent disturbance areas to be used in areas and working with the Kelowna Young Agrarians to farm other unused properties owned by the City as described in Section 6.1.

In addition, the City of Kelowna has a long history of supporting and promoting agricultural initiatives. Some existing initiatives include:

- Increasing the total area zoned as agricultural-rural;
- Protecting ALR lands from development by not supporting exclusions and limiting urban growth to the Permanent Growth Boundary;
- Protecting ALR lands from urban uses by implementing the Guide to Edge Planning through urban-side Farm Protection Development Permit requirements;
- Promoting local agriculture around the City through advertising; and
- Working closely with ALC staff on compliance and enforcement initiatives.

Continued proactive management to protect and enhance agriculture in the Kelowna area are expected to mitigate losses that result will from the proposed exclusion and have the potential to contribute significantly to agricultural revenue in the Central Okanagan.

6.4 Drainage, Irrigation and Water Quality

To minimize potential effects on drainage, stormwater best management practices will be implemented during and after construction in the exclusion area to ensure that the Project does not adversely affect drainage in the surrounding agricultural area (i.e., result in ponding or standing water or impede flow of water into Carney Pond or Mill Creek). Any water main construction will take into consideration the peak irrigation season to avoid disruption of irrigation. A Stormwater Management Plan will be developed prior to construction.

Additionally, the City of Kelowna will develop an Erosion and Sedimentation Control Plan to ensure that water quality is not affected during construction. In general, standard sediment and erosion control measure will be implemented to reduce the risk of sediments entering watercourses that may be used for irrigation purposes.

As part of facility development, the City of Kelowna will apply a spill and environmental emergency response plan to reflect the planned development on the exclusion area lands.

If best management practices are implemented and followed through construction and operation, no negative effects on water quality as it pertains to agriculture are expected.

6.5 Degradation of Soils on Agricultural Land

The following mitigation measures are intended to reduce the potential for degradation of agricultural soils during construction:

- Temporary laydown areas must not occur on agricultural lands. All temporary laydown areas will be located on non-ALR land or land slated for development.

- Topsoil should be salvaged in construction areas and used in other areas of the ALR, according to the Topsoil Salvage and Enhancement Strategy described in Section 6.1.
- Erosion and sedimentation control strategies should be implemented to avoid or reduce wind and water erosion.
- The City of Kelowna will update their spill and environmental emergency response plans to prevent accidental spills and contamination.
- A qualified professional should be responsible for monitoring soil salvaging activities or any earthworks on agricultural lands to prevent residual disturbance.

If these mitigation measures are implemented, residual adverse effects on soils are not expected.

6.6 Temporary Loss of Farm Infrastructure (Fencing)

The City of Kelowna will replace any fencing that may be impacted as a result of Project construction. Due to the lack of fencing and no adjacent farmlands, mitigation measures will be minimal, as agricultural is not expected to be affected.

7 RESIDUAL AND CUMULATIVE EFFECTS

Residual effects for ALR land loss will remain despite the mitigation strategies outlined in Section 6. Net losses of proposed will total to about 16 ha. However, the mitigation strategies outlined in Section 6 would help to reduce the effects of the lost ALR land. The Findlay and Stafford Road properties proposed for improvement total 4.5 ha.

Cumulative effects measure the potential effects of a project (primarily ALR exclusions) in combination with other past, present and future projects. Cumulative effects assessment considers the effects due to other projects and the thresholds where negative effects outweigh positive effects or create a negative feedback loop.

Exclusion applications in the Okanagan Region, specifically in Kelowna, are not very common, although pressures for non-farm use are on the increase. According to the City of Kelowna website, there are 30 ALR applications within the boundaries of the City. The ALC also reports all applications as part of their annual reporting. A review of the annual reports over the last five years indicates that an average of 9.8 ha (net of inclusions) of land are removed from the ALR annually in the Okanagan Region, which amounts to less than 1/1000th of a percent of the 224,745 ha of ALR land in the Okanagan Region (ALC 2014-2019, Table 7-1).

Table 7-1 Inclusion/Exclusion application approvals by the ALC

Fiscal Year	Inclusion (ha)	Exclusion (ha)	Net (ha)
2014-2015	2	1	1
2015-2016	4	23	-19
2016-2017	3	33	-30
2017-2018	20	0	+20
2018-2019	2	23	-21
Average	6.2	16	-9.8

In addition to the building of the Maintenance and Operation Facility, the City of Kelowna is proposing to develop access up to and around the proposed transit facility. This would be to include future road alignment options for a multi-modal corridor. It would be dependant on ALC approval under a future application. Note that the portion of the Serwa Properties on Bulman Road, east of Highway 97, will be preserved for agriculture as stated in Section 6.1.

Apart from this project, the project team is only aware of one other large-scale exclusion proposed in the Central Okanagan Region. The 6.2 ha parcel located at 2850 McCurdy Road is currently in exclusion application review, but are considering withdrawing their application, removing pressure on the ALR.

Although 16.2 ha is more than the average net loss of 9.8 ha (annually from the ALR), the cumulative effects of the Project are negligible because the exclusion area is not being farmed and there are no water rights and minimal farm infrastructure. The City of Kelowna recognizes that the planned reduction in ALR land to enable development is a concern and commits to the implementation of the mitigation measures and agricultural enhancement strategies described in this report.

8 ALTERNATIVES

The exclusion area (Serwa Property) has been identified as the most suitable option for the proposed transit operation and maintenance facility based a comprehensive search of potential properties (City-owned and private) by the City's Real Estate Department. Parameters considered include cost, location, property size, and future expansion capability. Expansion of the current facility is not considered feasible. A 2013 Facilities Study commissioned by BC Transit concluded, "The facility on Hardy Street will be unable to sustain continued growth of the transit system in this region [...] as there is no opportunity to expand the site due to adjacent property restrictions, consideration should be made to the eventual construction of either a secondary site, or a single consolidated facility to replace the existing one." BC Transit has reviewed the proposed site and endorsed its size and location. BC transit's long-term vision incorporates the full use of the 35 acres proposed for exclusion. Based on the long-term requirements identified by BC Transit, no other potential locations were identified by City Staff because they did not meet those requirements. The Serwa Property was broadly part of the City's infrastructure development planning since OCP planning in the 1990s, and input from the ALC in 1995. In their report the ALC states that playfields may be suitable for development or some parts of the site for industrial development (Provincial Agricultural Land Commission 1995).

Transit has tremendous potential to contribute to stronger, more sustainable communities. The need to realize this potential in the Central Okanagan is increasingly important because of factors such as climate change, population growth, increasing traffic congestion, and an aging demographic. For example, today there are over 120,000 registered vehicles in the region, and 90 % of residents commute to work by car. With the regional population increasing from 210,000 today to a forecast 277,000, in 2040, the number of automobile trips will increase in a constrained road network. Transit oriented development supported by a strong multi-modal network and transit demand management measures will reduce the rate at which congestion grows.

Meeting the demands of the forecasted population and traffic growth in the Central Okanagan requires a shift in focus from moving vehicles to moving people. In the past, government at all levels has attempted to build its way out of traffic congestion by expanding the road network, but this has only provided temporary relief. Major investments in expanding the road network to accommodate the private automobile do not align with local, regional and provincial planning aspirations. Without a significant increase in the use of transit and other sustainable modes (e.g., walking and cycling) the increase in daily trips will result in increased congestion on key local and regional transportation corridors. Congestion has negative environmental, social and economic impacts on the community and contributes to higher transit costs.

BC Transit have made a new transit Operations and Maintenance facility in Kelowna a top priority for capital projects under an Investing in Canada Infrastructure Program. A new facility is required because of rapid growth in transit ridership and significant recent expansions including Rapid Bus. The new facility is critical not only to meet today's demand but to accommodate growth over the next 25 years. Federal funding depends upon BC Transit and partner communities having certainty that projects can be successfully delivered within the horizon of the funding program - projects must be substantially completed by Fall 2027.

9 CONCLUSIONS

The City of Kelowna commissioned Associated to complete an Agricultural Impact Assessment (AIA) for the proposed development of an Operations and Maintenance Facility for public transit on the Serwa Property located in the ALR, focussing on a proposed exclusion area. The results of the AIA indicate that the exclusion of ALR land will result in the

loss of approximately 16 ha of Class 3 agricultural lands (improved rating). This land is currently not being farmed and has not been farmed since its purchase in 2017. Any ALR loss is typically compensated for by adding the same amount of similar or better capacity land to the ALR. This compensation is considered challenging because of the lack of suitable non-ALR land. Therefore, other mitigation measures such as topsoil enhancement, farming of other City-owned lands by the young Agrarians, and other initiatives set forth by the City to protect and enhance agriculture will offset the negative effects on agriculture. Furthermore, management practices and careful planning and monitoring during design, construction and operations will ensure that potential negative effects on surrounding agriculture pockets are minimized.

If all of the mitigation measures and strategies, as described in Section 6, are implemented, the residual adverse effects on agriculture are likely to be small. Cumulative effects of the exclusion, in combination with other potential exclusion applications (including the exclusion of the remainder of the Serwa Properties), are negligible because the exclusion area is not being farmed and there is low probability that it will be because it is City-owned, the City does not plan to lease it for farming, and it is not compatible with the adjacent land use (UBC Okanagan, John Hindle Drive, and Highway 97).

The next step will be meetings with the ALC prior to a formal application for exclusion.

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APPENDIX A - KELOWNA AGRICULTURAL IMPACT ASSESSMENT TERMS OF REFERENCE

1. Introduction

The City of Kelowna [Development Application Procedures Bylaw](#) (Bylaw No. 10540) establishes that the Director, Land Use Management may require the applicant to provide information on, and a systematic detailed assessment of, the proposal to assist the City's decision making. As such, an Agricultural Impact Assessment (herein after referred to as the "Assessment") will be required to determine if a development proposal will adversely affect existing and future agricultural activities onsite and/or in the area surrounding the proposed development or change in land use.

An Assessment is not a soils assessment. An Assessment is a comprehensive consideration of the potential for agricultural production in all of its forms; along with a prediction of likely outcomes (both positive and negative) as a result of the proposed development. An Assessment typically includes a soils analysis.

Assessments will normally accompany applications under the [Agricultural Land Commission Act](#) (i.e. exclusion, subdivision, or non-farm use) in addition to applications to amend the City's [Official Community Plan](#) or [Zoning Bylaw](#) where the land is presently zoned for agriculture. Assessments may also be required when seeking approval for residential uses (e.g. Additional Dwelling for Farm Employee or Temporary Farm Worker Housing) on land zoned for agriculture.

2. Selection of Personnel

Assessments are to be prepared and/or coordinated by one or more "Qualified Professionals (QPs)" as necessary. The number and qualifications of individuals involved will be site/context dependent. For this purpose, a "Qualified Professional" is typically a Professional Agrologist (P.Ag.) registered in British Columbia.

Assessments will be prepared, signed and sealed by the QP(s), unless otherwise approved by the Director of Land Use Management. Where information or expertise are required outside of an individuals professional competencies, additional QP(s) will be required. In these cases, the submission must be signed and sealed by each contributor.

Consistent with the BCIA [Code of Ethics](#), QPs must only provide service in areas of their professional competence, and practice within the limits of their training, ability, and experience.

3. Consultation with City Staff

The information contained within these TOR is intended as a general guide only and is not a comprehensive list of requirements. Each Assessment should be site specific and is likely to be unique in the information required. **The QP is therefore advised to work with City staff to review and confirm a site specific TOR prior to commencing work on the Assessment.** In some instances (i.e. smaller developments, or those with little or no perceived impact) it may only be necessary to assess a few of the issues contained herein. In larger or more complex proposals, the applicant may be required to address considerations not identified herein.

Every effort will be made to clarify the requirements in the early phases of each development application. **It is the responsibility of the applicant to confirm the TOR for the Assessment prior to undertaking the Assessment.**

4. Key Policy Considerations

In preparing an Assessment, the QP should consider how the proposal meets or does not meet City policy including, but not limited to the Official Community Plan as follows:

- **Protect Agricultural Land.** Retain the agricultural land base by supporting the ALR and by protecting agricultural lands from development, except as otherwise noted in the City of Kelowna Agricultural Plan. Ensure that the primary use of agricultural land is agriculture, regardless of parcel size.
- **ALR Exclusions.** The City of Kelowna will not forward ALR exclusion applications to the ALC except in extraordinary circumstances where such exclusions are otherwise consistent with the goals, objectives and other policies of this OCP. Soil capability alone should not be used as justification for exclusion.
- **Urban Uses.** Direct urban uses to lands within the urban portion of the Permanent Growth Boundary, in the interest of reducing development and speculative pressure on agricultural lands.
- **Agri-tourist Accommodation.** Agri-tourist accommodation will only be approved and operated in a manner that supports agricultural production and which limits the impact on agricultural land, City services and the surrounding community.
- **Non-farm Uses.** Support non-farm use applications on agricultural lands only where approved by the ALC and where the proposed uses:
 - are consistent with the Zoning Bylaw and OCP;
 - provide significant benefits to local agriculture;
 - can be accommodated using existing municipal infrastructure;
 - minimize impacts on productive agricultural lands;
 - will not preclude future use of the lands for agriculture;
 - will not harm adjacent farm operations.
- **Subdivision.** Maximize potential for the use of farmland by not allowing the subdivision of agricultural land into smaller parcels (with the exception of Homesite Severances approved by the ALC) except where significant positive benefits to agriculture can be demonstrated.
- **Housing in Agricultural Areas.** Discourage residential development (both expansions and new developments) in areas isolated within agricultural environments (both ALR and non-ALR).
- **Farm Help Housing.** Accommodation for farm help on the same agricultural parcel will be considered only where:
 - agriculture is the principal use on the parcel, and
 - the applicant demonstrates that the additional housing is necessary to accommodate farm employee(s) whose residence on the farm property is considered critical to the overall operation of the farm. The primary consideration is whether the scale of the farm operation is large enough that permanent help is deemed necessary.

Temporary farm worker housing (e.g. bunkhouse accommodation on non-permanent foundations) is the preferred solution where the need for farm worker housing is justified.

- **Homeplating.** Locate buildings and structures, including farm help housing and farm retail sales area and structures, on agricultural parcels in close proximity to one another and where appropriate, near the existing road frontage. The goal should be to maximize use of existing infrastructure and reduce impacts on productive agricultural lands.
- **Public Use.** Discourage the use of agricultural lands for public or institutional uses such as schools, parks and churches except as identified in the OCP.
- **Service Corridors.** Minimize the impact of penetration of road and utility corridors through agricultural lands, utilizing only those lands necessary and to the maximum capacity prior to seeking new corridors. Provision should be made for farm traffic to cross major roads.

5. Professional Standards

- 5.1. One (1) original signed and sealed Assessment must be retained on file (a photocopy signature and seal will not be accepted). The person or corporation who prepared the Assessment must be identified along with the person or corporation who requested and funded the Assessment.
- 5.2. The Assessment must include the following information:

- All personnel working on the project and their contributions.
 - A 1-page biography or C.V. of each professional and technical staff contributing to the results, interpretations and recommendations as an addendum.
 - The level of effort in terms of personnel and time spent on site evaluations must be clearly stated including the time of year and length of site evaluations.
- 5.3. The Assessment must conform to all municipal bylaws and plans, provincial and federal legislation, regulations, standards and best practices.
 - 5.4. Site conditions likely to be absent during the period of evaluation need to be documented and assessed by appropriate alternative methods.
 - 5.5. The Assessment must reflect the site conditions prior to the proposed disturbance and the anticipated site conditions post-development.
 - 5.6. The Assessment must acknowledge off-site developments (both existing and those permitted by current regulations) and the impact these developments may have on the subject property.
 - 5.7. The Assessment should reflect an “Avoid - Mitigate - Compensate” approach to negative impacts. Mitigation should be considered where it has been determined that negative impacts cannot be avoided. Where impacts can neither be avoided or mitigated, QPs should identify appropriate compensation measures to ensure no negative net impacts and ideally a positive net impact.
 - 5.8. The Assessment should account for “cumulative effects”. Cumulative effects are changes that are caused by an action in combination with other past, present and future actions. Cumulative effects assessment considers the effects due to other projects and the thresholds where negative effects outweigh positive effects, or create a feedback loop.
 - 5.9. Methods used in the Assessment must be repeatable and based on agency and/or scientific standards appropriate the landscape being assessed. All data and non-standard methods contributing to the results, interpretations and recommendations contained in the Assessment must be included as appendices.
 - 5.10. Any past Assessments for the subject property or a portion thereof must be identified and their relevance/usefulness in completing this Assessment noted.

6. Basic Assessment Requirements

- 6.1. Briefly outline the history, type and extent of agricultural operations on the subject property (vegetative & crop cover, agricultural buildings, etc.), including recent changes.
- 6.2. Describe the soil types and agricultural capability of the land using best available secondary data (e.g. Canada Land Inventory, Terrestrial Ecosystem Modeling, etc.) for the subject property.
- 6.3. Describe adjacent land uses including the location and description of the type and intensity of surrounding agricultural and non-agricultural land uses.
- 6.4. Describe any non-agricultural land uses and indicate conflicts with existing and potential on-site agriculture. If agriculture is no longer taking place on the subject property and/or area, outline the limiting factor(s) and provide an estimate of barriers, if any, to re-establishing farming on the subject property and/or portion of the subject property under consideration. Current commodity prices and/or input costs should not be used as a barrier to production.

- 6.5. Describe the proposed use and its compatibility, or incompatibility within an agricultural area and potential to cause secondary impacts. A determination of the types and extents of potential impacts that may result from the proposed development should be identified.
- 6.6. Where the principal justification for the proposal is based on soil or land limitations, primary investigation of soils is required. In this case, the QP will ensure that the sample locations and number of pits/samples provides for a representative understanding of the subject property or area being considered.
- 6.7. Identify and describe site and soil improvements completed in the past (e.g. drainage, irrigation, contouring).
- 6.8. Identify and describe future site and soil improvements that are, or may be possible. Provide an estimate of the costs to undertake the improvements and a cost/benefit analysis of each.
- 6.9. Examine possible alternative sites for the intended use that would avoid or lessen agricultural impacts (i.e. urban areas/industrial areas). If no alternative sites can be identified, the Assessment should include a determination of mitigative actions that would be required if the proposal were to proceed (i.e. confining the development to areas with the least productive soils and/or terrain).
- 6.10. Estimate the value in the long term, of the loss of any agricultural production and mitigative measures to offset the loss.
- 6.11. Assess the flexibility of the site for different types of agricultural operations (alternatives). A feasibility & capacity assessment must consider each available opportunity for the following at a minimum:
 - anticipated barriers or constraints;
 - the area potentially affected;
 - the estimated development (capital) costs; and
 - the estimated annual return.
- 6.12. Assess the degree to which the proposal will sever or fragment agricultural land and describe/quantify the impact.
- 6.13. Consider the impact of the proposed use on drainage (on site and neighbouring properties).
- 6.14. Consider the impact of traffic (vehicular, pedestrian and cycling) of the proposed use to determine if proposed traffic volumes will impede farmers moving vehicles between fields and if recreational traffic will be kept out of agricultural land.
- 6.15. Examine and report on what it would take to develop the site for:
 - Crops and by-products that would be new to the site and area;
 - Non-soil based agricultural options (i.e. vegetable or nursery greenhouse, etc.); and
 - Accessory farm uses (i.e. B&B, agri-tourism, on-farm processing, on-farm retail).
- 6.16. Examine and report on alternative financial models for farming and their appropriateness to this site such as:
 - Leasing to other farmers;
 - Joint ownership by two or more farmers;
 - Community supported agriculture;
 - Leased garden plots for urban residents; and
 - Other.

- 6.17. Farm Home Plate - Assessments triggered by site development for residential uses on A1 zoned land should include a recommendation for the suitable location for the farm home plate. The farm home plate must be sited so as not to have a negative effect on the existing agricultural operation or potential for future agricultural operations.
- 6.18. Agricultural Worker Dwellings - Assessments triggered by site development of Agricultural Worker Dwellings (including temporary) should indicate the “need” for the additional dwelling onsite and why farm help cannot be accommodated offsite, along with the net benefit to agriculture.

7. Data Deliverables

- 7.1. Site description including legal description (i.e. lot & plan number, etc.), OCP designation, Zoning category, and Agricultural Land Reserve (ALR) status should be illustrated on the location map or stated at the outset of the assessment. For large parcels, UTM coordinates of the site location where specific works will occur may be required.
- 7.2. Location Map at an appropriate scale (1:20,000) indicating the regional setting. This information should be overlaid on the most current cadastral map.
- 7.3. Site Map(s) at an appropriate scale (minimum 1:200 and maximum 1:5,000) indicating the layout of the project components and activities. This information should be overlaid on the most current cadastral map outlining surrounding property boundaries. Map legends should show clear descriptions of all symbols used as per provincial standards.
- 7.4. Cross sections in sufficient number to demonstrate terrain conditions prior to the proposed site disturbance and intended conditions post-development. A topographic survey must show natural slope contours (at appropriate contour levels e.g. 1 or 5 m) and the post-development contours.
- 7.5. Site Plans/sketches/colour photographs indicating the project location, site features and activities should be indicated with relation to easily identifiable landmarks such as those found on accompanying maps.
- 7.6. Appropriate referencing of all image and data sources, with a clear indication of the date of when the information was obtained.
- 7.7. Final Submission - shall include the following at a minimum:
 - 1 colour hard copies.
 - 1 digital copy in .pdf format and unprotected.
 - Maps should be printed on 8-1/2 x 11 or 11 x 17” paper as appropriate and to scale.
 - Where available, digital copies of supporting information should be provided in a format compatible with the ESRI platform (shapefiles) in NAD83 UTM Zone 11.

8. Incomplete or Deficient Assessments

If it is determined by the Director, Land Use Management, that an Assessment is incomplete or deficient, the applicant will be notified in writing the nature of deficiencies.

9. Third Party Review

The City of Kelowna reserves the right to seek a third party review of the Assessment submitted. If necessary, the third party reviewer will be a mutually acceptable QP and the cost of the review shared equally among the applicant and municipality.

APPENDIX B - POTENTIAL FUTURE TRANSPORTATION NETWORK

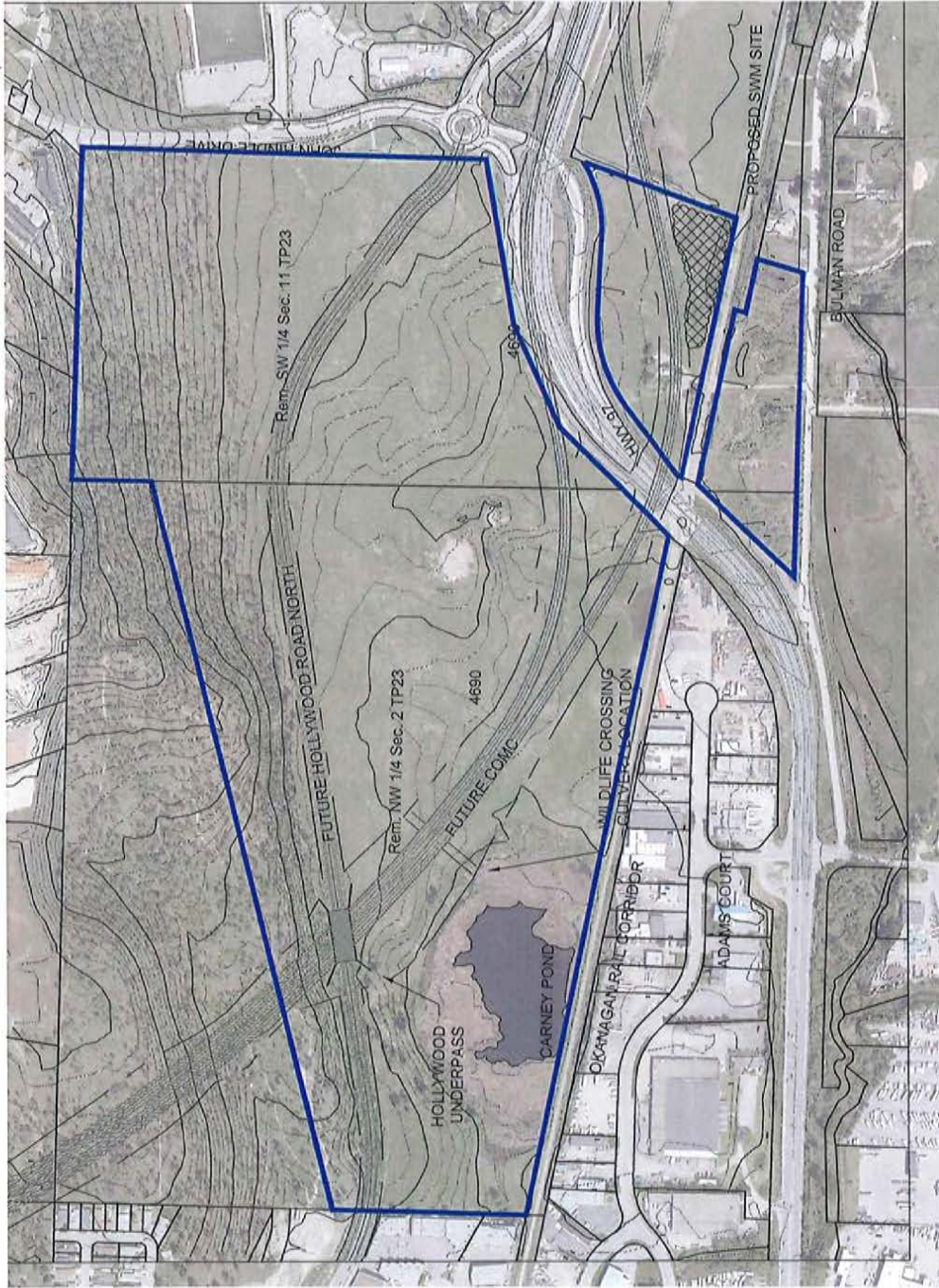


FIGURE No. B-1
CITY OF KELOWNA
FUTURE TRANSPORTATION NETWORK

AE PROJECT No.	SCALE	
20182664-00	1:5000	
APPROVED DATE	REV	DESCRIPTION
2018DEC20	0	ISSUED FOR INFORMATION

FOR INFORMATION ONLY



APPENDIX C - SOIL FERTILITY

PSAI

December 2, 2019

Associated Environmental

②

Sample	pH	Est E.C. mmhos cm	Lime Rqmt lbs 1000 sq ft	Total O.M. %	Total N %	C/N	Bray Avall P ppm	Avall K ppm	Avall Ca ppm	Avall Mg ppm	Avall Na ppm	Avall Cu ppm	Avall Zn ppm	Avall Fe ppm	Avall Mn ppm	Avall B ppm
Serwa SCL	7.5	0.44		6.9	0.24	16.7	60	1050	3350	525	39	0.2	5.5	3.5	85	0.2
Serwa SC/CL	6.8	0.18		3.0	0.10	17.4	23	360	1050	205	12	1.4	2.4	12	75	0.1

Nutrient Legend VL= Very Low L= Low M= Moderate (✓) = Adequate SH= Slightly High H= High

Unit # 5 - 11720 Voyager Way, Richmond, B. C. V8X 3G9 604-273-8226