City of Kelowna
Regular Council Meeting
AGENDA

Monday, April 24, 2023

1:30 pm

Council Chamber

City Hall, 1435 Water Street

Pages

1. Call to Order

I would like to acknowledge that we are gathered today on the traditional, ancestral, unceded territory of the syilx/Okanagan people.

This Meeting is open to the public and all representations to Council form part of the public record. A live audio-video feed is being broadcast and recorded on kelowna.ca.

2. Confirmation of Minutes 4 - 10

PM Meeting - April 17, 2023

3. Development Application Reports & Related Bylaws

3.1 Benvoulin Road 2809 - OCP22-0010 Z22-0059 - Gurdwara Guru Amardas Darbar Sikh Society 11 - 30

To NOT amend the Official Community Plan or rezone the subject property that would facilitate future religious assembly use.

3.2 Barber Rd 135, Barber Rd 155 and Hwy 33 W 765, TA22-0018 (BL 12514) - ASI BARBER ROAD GP INC, INC NO A0122606 31 - 43

To amend Zoning Bylaw No. 12375 to allow a site-specific text amendment for the subject properties.

3.3 Barber Rd 135, Barber Rd 155 and Hwy 33W 765 - BL 12514 (TA22-0018) - ASI BARBER ROAD GP INC, INC NO A0122606 44 - 45

To give Bylaw No. 12514 first reading for a site-specific text amendment for the subject properties.

3.4 Ethel St 2473 - TA23-0003 (BL 12515) - B.C. Life Builders Rehabilitation Society, Inc.No.S-0037307 46 - 58

To amend Zoning Bylaw No. 12375 to allow a site-specific text amendment for Boarding or Lodging House within an accessory building.

4.10 **Rail Trail Access Permit with OKIB** 251 - 430

To execute an agreement where Kelowna constructs, operates, and maintains the Okanagan Rail Trail on a Permit Area authorized by the Okanagan Indian Band on Indian Reserve No. 7.

4.11 **Water and Wastewater Servicing Agreement with OKIB IR7** 431 - 460

To execute an agreement where Kelowna provides water and wastewater servicing to Okanagan Indian Band lands on Indian Reserve No. 7.

5. Bylaws for Adoption (Non-Development Related)

5.1 **BL12501 - Amendment No. 1 to the Five Year Financial Plan 2022-2026 Bylaw No. 12338** 461 - 462

To adopt Bylaw No. 12501.

5.2 **BL12513 - Amendment No. 11 to Miscellaneous Fees and Charges Bylaw No. 9381** 463 - 463

To adopt Bylaw No. 12513.

5.3 **BL12512 - Amendment No. 23 to the Subdivision, Development and Servicing Bylaw No. 7900** 464 - 465

To adopt Bylaw No. 12512.

6. Mayor and Councillor Items

7. Termination

City of Kelowna
Regular Council Meeting
Minutes

Date:	Monday, April 17, 2023
Location:	Council Chamber City Hall, 1435 Water Street
Members Present	Mayor Tom Dyas, Councillors Ron Cannan*, Maxine DeHart, Charlie Hodge, Gord Lovegrove, Mohini Singh, Luke Stack, Rick Webber and Loyal Wooldridge
Staff Present	City Manager, Doug Gilchrist; Deputy City Clerk, Laura Bentley; Divisional Director, Planning & Development Services, Ryan Smith*; Development Planning Department Manager, Terry Barton*; Financial Planning Manager, Melanie Antunes*; Revenue Supervisor, Patrick Gramiak*; Budget Supervisor, Jennifer Gills*; Acting Controller, Matt Friesen*; Acting Divisional Director, Financial Services, Joel Shaw*; General Manager, Infrastructure, Mac Logan*; Utility Services Manager, Kevin Van Vliet*; Parks & Buildings Planning Manager, Robert Parlane*; Park & Landscape Planner, Stefan Johansson*; Divisional Director, Partnership & Investments, Derek Edstrom*; Real Estate Department Manager, Johannes Saufferer*; Long Range Policy Planning Manager, Robert Miles*; Strategic Transportation Planning Manager, Mariah Van Zerr*; Policy & Planning Department Manager, Danielle Noble-Brandt*; Urban Forestry Supervisor, Tara Bergeson*; Sustainability Coordinator, Tracy Guidi*; Legislative Technician, Natasha Beauchamp
Staff participating Remotely	Legislative Coordinator (Confidential), Arlene McClelland
Guests	Willowstone Academy Better World Club Students*
Guests Remotely	Amelia Needoba*, Diamond Head Consulting

(* Denotes partial attendance)

1. Call to Order

Mayor Dyas called the meeting to order at 1:30 p.m.

I would like to acknowledge that we are gathered today on the traditional, ancestral, unceded territory of the syilx/Okanagan people.

This Meeting is open to the public and all representations to Council form part of the public record. A live audio-video feed is being broadcast and recorded on kelowna.ca and a delayed broadcast is shown on Shaw Cable.

2. Confirmation of Minutes

Moved By Councillor Hodge/Seconded By Councillor Lovegrove

THAT the Minutes of the Regular Meetings of April 3, 2023 be confirmed as circulated.

Carried

3. Public in Attendance

3.1 Better World Club, Willowstone Academy (Winners of 2023 Sustainable Development Challenge)

Student Guests:
- Provided a presentation to Council regarding Project Mini Forests that won the 2023 Sustainable Development Challenge.
- Requested the City to partner with land for their second mini forest location that can be as small as a parking space.
- Asked that the City require developers to plant trees and to support the Sustainable Urban Forest Strategy.
- Responded to questions from Council.

Councillor Cannan joined the meeting at 1:32 p.m.

Mayor Dyas:
- Announced a financial contribution of $5,000 to match the 2023 Sustainable Development Challenge award and requested the group report back to Council on their progress.

The meeting recessed at 1:48 p.m.

The meeting reconvened at 1:54 p.m.

4. Development Application Reports & Related Bylaws

4.1 Rezoning Bylaw Supplemental Report to Council

Deputy City Clerk:
- Confirmed no correspondence was received for the rezoning on Polo and Sexsmith Roads.

4.2 Rezoning Bylaw Readings

4.2.1 Polo Rd 2019 - BL12510 (Z23-0005) - 1383931 B.C. Ltd., Inc. No. BC1383931

4.2.2 Sexsmith Rd 2930 - BL12511 (Z22-0019) - Reid Industrial Centre Ltd., Inc. No. BC1326474

Moved By Councillor Hodge/Seconded By Councillor Lovegrove

THAT Bylaw No. 12510 and 12511 be read a first, second and third time.

Carried

5. Non-Development Reports & Related Bylaws

5.1 2023 BC Growing Communities Fund Allocation

Staff:
- Displayed a PowerPoint Presentation summarizing the fund receipt and allocation.

Moved By Councillor Wooldridge/Seconded By Councillor Stack

THAT Council receives, for information, the report from the Financial Services Department dated April 17,2023 with respect to the 2023 BC Growing Communities Fund;

AND THAT the 2023 Financial Plan be amended to include the receipt of the $26,228,000 grant funds, and the contribution of the funds to reserve;

AND FURTHER THAT Council direct staff to return to Council to present a project plan to use the grant funds.

Carried

5.2 2023 Tax Distribution

Staff:
- Displayed a PowerPoint Presentation outlining distribution of taxation demand among property classes that will result in the 2023 tax rate.

Moved By Councillor Webber/Seconded By Councillor Wooldridge

THAT Council approve a Municipal Tax Distribution Policy as outlined in the Report dated April 17, 2023, for the year 2023 that will result in a modification of the 2022 Tax Class Ratios to reflect the uneven market value changes which have been experienced between property classes, as follows:

Property Class	2022 Tax Class Ratios	2023 Tax Class Ratios
Residential/Rec/NP/SH	1.0000:1	1.0000:1
Utilities	6.0783:1	5.7720:1
Major Industrial	7.5328:1	8.5581:1
Light Industrial/Business/Other	2.5451:1	2.4594:1
Farm Land	0.2052:1	0.2307:1
Farm Improvements	0.4905:1	0.5149:1

AND THAT Council approve development of 2023 tax rates to reflect the 2023 assessment changes in property market values.

Carried

5.3 Amendment No. 1 to Five Year Financial Plan 2022 - 2026 Bylaw

Staff:
- Displayed a PowerPoint Presentation summarizing the transfers and amendments to the 2022-2026 Financial Plan.

Moved By Councillor Cannan/Seconded By Councillor Lovegrove

THAT Council receives, for information, the Report from Financial Services dated April 17, 2023 with respect to amendments to the Five Year Financial Plan 2022-2026 Bylaw;

AND THAT Bylaw No. 12501 being Amendment No. 1 to the Five Year Financial Plan 2022-2026 Bylaw No. 12338 be advanced for reading consideration.

Carried

5.4 BL12501 - Amendment No. 1 to the Five Year Financial Plan 2022-2026 Bylaw No. 12338

Moved By Councillor Stack/Seconded By Councillor Wooldridge

THAT Bylaw No.12501 be read a first, second and third time.

Carried

5.5 Miscellaneous Fees and Charges Bylaw No. 9381 – Amendment

Staff:
- Displayed a PowerPoint Presentation outlining the proposed amendments and responded to questions from Council.

Moved By Councillor Lovegrove/Seconded By Councillor DeHart

THAT Council receive for information the report of the Miscellaneous Fees and Charges dated April 17, 2023;

AND THAT Bylaw No. 12513 being Amendment No. 11 to the Miscellaneous Fees and Charges Bylaw 9381 be advanced for reading consideration.

Carried

5.6 BL12513 - Amendment No. 11 to Miscellaneous Fees and Charges Bylaw No. 9381

Moved By Councillor Wooldridge/Seconded By Councillor Stack

THAT Bylaw No. 12513 be read a first, second and third time.

Carried

5.7 Approved Products List

Staff:
- Displayed a PowerPoint Presentation summarizing the changes to the Approved Products List and responded to questions from Council.

Moved By Councillor Cannan/Seconded By Councillor Lovegrove

THAT Council receives, for information, the report from the Financial Services Division, dated April 17, 2023, regarding Council Policy 266;

AND THAT Council Policy No. 266, being Subdivision, Development & Servicing – Approved Products List, be rescinded;

AND THAT Bylaw No. 12512, being Amendment No. 23 to Subdivision Development and Servicing Bylaw No. 7900, be forwarded for reading consideration;

AND FURTHER THAT Council Policy No. 265, being Engineering Drawing Submission Requirements, be revised as outlined in the Report from the Financial Services Division dated April 17, 2023.

Carried

5.8 BL12512 - Amendment No. 23 to the Subdivision, Development and Servicing Bylaw No. 7900

Moved By Councillor Stack/Seconded By Councillor Wooldridge

THAT Bylaw No. 12512 be read a first, second and third time.

Carried

5.9 Water and Wastewater Service Agreements with District of Lake Country

Staff:
- Displayed a PowerPoint Presentation outlining the Water and Sewer Agreements with Lake Country and responded to questions from Council.

Moved By Councillor Cannan/Seconded By Councillor Stack

THAT Council receives for information the report from the Infrastructure General Manager dated April 17, 2023, with respect to Water and Sewer Service Agreements between Kelowna and the District of Lake Country;

AND THAT the Mayor and City Clerk be authorized to execute the Bulk Water Supply Agreement and the Sewer Services Agreement on behalf of the City of Kelowna;

AND FURTHER THAT the 2023 Financial Plan be amended to include $1.3 million for the Beaver Lake Service Area Sewer Extension project funded from the Wastewater Utility.

Carried

5.10 Pickleball and Tennis Long Term Parks Planning

Staff:
- Displayed a PowerPoint Presentation outlining the long-term Parks Planning Initiative concerning outdoor pickleball and tennis court provision and responded to questions from Council.

Moved By Councillor Lovegrove/Seconded By Councillor Hodge

THAT Council receives for information, the report from Parks & Buildings Planning dated April 17, 2023, with respect to future strategy for outdoor pickleball and tennis courts within the city's parks system;

AND THAT Council directs staff to proceed with the design of both Glenmore Recreation Park and DeHart Park in accordance with this strategy.

Carried

5.11 Non-Market Lease of 1360 Bertram Street to Pathways Abilities Society

Staff:
- Displayed a PowerPoint Presentation summarizing the non-market lease agreement and responded to questions from Council.

Moved By Councillor Hodge/Seconded By Councillor Wooldridge

THAT Council receives, for information, the report from the Real Estate department dated April 17, 2023, with respect to a 60-year non-market lease agreement between the City of Kelowna and the Pathways Abilities Society;

AND THAT Council approves a 60-year non-market lease of the city-owned property at 1360 Bertram Street to the Pathways Abilities Society, as per the general terms and conditions of the

agreement attached as Schedule A to the report from the Real Estate department dated April 17, 2023;

AND FURTHER THAT the Mayor and City Clerk be authorized to execute the Lease Agreement and all documents necessary to complete this transaction.

Carried

The meeting recessed at 3:05 p.m.

The meeting reconvened at 3:14 p.m.

5.12 2022 Progress Report - OCP and Transportation Master Plan

Staff:
- Displayed a PowerPoint Presentation outlining the progress report for the 2040 Official Community Plan and Transportation Master Plan and responded to questions from Council.

Moved By Councillor DeHart/Seconded By Councillor Wooldridge

THAT Council receives, for information, the report from Policy & Planning and Integrated Transportation, dated April 17, 2023, with regard to the 2022 Progress Report for the Official Community Plan and Transportation Master Plan and responded to questions from Council.

Carried

5.13 Sustainable Urban Forest Strategy - Goals and Strategies

Staff:
- Acknowledged Amelia Needoba, Diamond Head Consulting that joined the meeting remotely.
- Displayed a PowerPoint Presentation providing an update on the Sustainable Urban Forest Strategy progress and responded to questions from Council.

Moved By Councillor Hodge/Seconded By Councillor Lovegrove

THAT Council receives, for information, the report from the Parks Services and Policy & Planning Departments dated April 17, 2023, with respect to the Sustainable Urban Forest Strategy goals and strategies.

Carried

6. Mayor and Councillor Items

Councillor Stack:
- There has been a change of date to the Kelowna Springs Public Hearing to Tuesday, June 20, 2023 with correspondence being accepted from May 23, 2023 onward.

Councillor Wooldridge:
- Spoke to their participation in the Crime Stoppers Fundraiser.
- Spoke to their attendance at the Vaisakhi celebrations.
- Spoke to their attendance at the Central Okanagan Hospice Swinging with the Stars Fundraiser.

Councillor DeHart:
- Spoke to their attendance at the Chamber of Commerce AGM , luncheon and Board meeting.
- Spoke to their attendance at the UDI luncheon.
- Reminder that the 2023 Civic Awards in on Thursday, April 20, 2023 at the Laurel Packing House.

Councillor Cannan:
- Spoke to previous Wilden and Clifton Road transit Notice of Motion.
- Advised that staff confirmed that transit is not currently planned for the Wilden area; the focus is on building frequent transit service connecting town centres and addressing areas of higher demand.
- Provided comment on potential digital on-demand service.
- Requested RCMP traffic monitoring on Upper Canyon Drive.
- Spoke to recent Provincial Housing announcement regarding up to four units on single family lots.
- Spoke to their participation in the KLO Residents Association bike tour.

City Manager:
- Provided comment on the Provincial Housing announcement, infrastructure needs and transit expansion.

Councillor Singh:
- Spoke to their attendance at the Vaisakhi celebrations and noted the parade will be held on April 29, 2023.

Councillor Hodge:
- Provided an update on their Notice of Motion to send a letter to the Province regarding a derelict houseboat on ferry docks on the lake.

Councillor Singh:
- Will be speaking about Kelowna at the Transatlantic Community Policy Lab at York University.

Councillor Lovegrove:
Provided an update on their Notice of Motion regarding declaring a climate crisis.
- Spoke to their participation in the KLO Residents Association bike tour.
- Spoke to their upcoming attendance of the Finning Tractor opening on behalf of Mayor Dyas.

Mayor Dyas:
- Spoke to the Crime and Safety Task Force Terms of Reference to come forward in a Council package.

7. Termination

This meeting was declared terminated at 4:36 p.m.

Mayor Dyas

Deputy City Clerk

/acm

REPORT TO COUNCIL

Date:	April 24, 2023		
To:	Council		
From:	City Manager		
Department:	Development Planning		
Application:	OCP22-0010/Z22-0059	**Owner:**	Gurdwara Guru Amardas Darbar Sikh Society Inc. No S0040725
Address:	2809 Benvoulin Road	**Applicant:**	Urban Options Planning Corp.
Subject:	Official Community Plan Amendment and Rezoning Application		
Existing OCP Designation:	R-AGR - Rural - Agriculture and Resource		
Proposed OCP Designation:	EDINST – Education / Institutional		
Existing Zone:	A2 – Agriculture / Rural Residential		
Proposed Zone:	P2 – Education and Minor Institutional		

1.0 Recommendation

THAT Official Community Plan Map Amendment Application No. OCP22-0010 to amend Map 4.1 in the Kelowna 2040 – Official Community Plan Bylaw No.12300 by changing the Future Land Use designation of Lot 1 District Lot 130 ODYD Plan 8064 located at 2809 Benvoulin Road, Kelowna, BC from the R-AGR - Rural - Agriculture and Resource designation to the EDINST – Education / Institutional designation, NOT be considered by Council.

AND THAT Rezoning Application No. Z22-0059 to amend the City of Kelowna Zoning Bylaw No. 12375 by changing the zoning classification of Lot 1 District Lot 130 ODYD Plan 8064 located at 2809 Benvoulin Road, Kelowna, BC from the A2 – Agriculture / Rural Residential zone to the P2 – Education and Minor Institutional zone, NOT be considered by Council.

2.0 Purpose

To review a Staff recommendation to NOT amend the Official Community Plan or rezone the subject property that would facilitate future religious assembly use.

3.0 Development Planning

The Sikh community in Kelowna has gradually outgrown their place of assembly and worship at 220 Davie Road in Rutland and wish to construct a new Gurdwara for their growing community. A search for a suitable location has taken place over the past few years and finding a new location for a larger congregation has proved challenging.

The subject property is located in the Benvoulin area and is considered an important agricultural corridor for both existing agricultural activity and heritage. Official Community Plan (OCP) policies specifically discourage public or private institutional use including places of religious assembly on agricultural lands. Although not within the Agricultural Land Reserve (ALR), the property is designated and zoned for agriculture and directly borders ALR land. Any urban development is discouraged in areas outside of the Permanent Growth Boundary to minimize development and speculative pressure on agricultural lands. Based on these overall OCP policies the Planning Department is recommending non-support for the proposed OCP and Rezoning amendments to facilitate future religious assembly on the subject property.

Staff have reviewed this application, and it may move forward without affecting either the City's Financial Plan or Waste Management Plan.

4.0 Proposal

4.1 Background

The subject property is designated R-AGR Rural - Agriculture and Resource, is zoned A2 – Agriculture / Rural Residential, is outside of the PGB, but is not within the Agricultural Land Reserve (ALR). However, the property is bordering ALR lands to the north and east. There is currently a single-family dwelling on the property and its current use is rural residential.

4.2 Project Description

The building for the proposed religious assembly and Gurdwara is approximately 2,335 m^2, two and half storeys tall and located in centre of the property. It includes areas for worship, classrooms, office space and washrooms. Primary access would be from Boyd Road with drive aisle circulation around the proposed building. The remainder of the property is used for parking stalls, landscaping, agricultural buffer and vegetable and fruit gardens.

The agricultural buffer is proposed at 8.0 m wide and stretches the length of the north and east property boundaries, separating it from the active agriculture and ALR. Approximately 206 m^2 of area along the north-east property lines is proposed to be used for vegetable garden to provide a link to agriculture and for food donation to the community. In partnership with The Bridge – Youth and Family Services, the Sikh society will donate vegetables to their organization.

If Council chose to proceed with the OCP Amendment and Rezoning proposal, Council consideration of a Form and Character Development Permit would be required along with a staff issued Farm Protection Development Permit.

Site Context

The subject property is located on the Benvoulin Road corridor which has frontage on Benvoulin Road and access from Boyd Road to the south. It is located north of the KLO/ Benvoulin Road intersection and is approximately 2.25 acres in size. Specifically, adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	A1 - Agriculture	Agriculture
East	A1 - Agriculture	Agriculture
South	RU1 – Large Lot Housing	Residential
West	A1 - Agriculture	Benvoulin Road / Agriculture

Subject Property Map: 2809 Benvoulin Road

5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

The Big Picture: 10 Pillars to Realize our Vision **1. Protect Agriculture -** Agriculture has played a crucial role in Kelowna's economy for generations and is a big part of Kelowna's identity. Local food production is also becoming even more important in the face of a changing climate. As such, protecting agricultural lands is key goal of Imagine Kelowna. The Official Community Plan supports this critical component of our economy, identity and food security by limiting urban growth into agricultural lands and supporting their viability.	
Objective 8.1. Protect and preserve agricultural land and its capability.	
Policy 8.1.1. Protect Agricultural Land.	Retain the agricultural land base by supporting the ALR and by protecting agricultural lands from development. Ensure that the primary use of agricultural land is agriculture, regardless of parcel size.
	The property is 2.25 ac is size and could be utilized for agricultural purposes. It is not located within the Agricultural Land Reserve, however the property is still considered agricultural and is directly adjacent to ALR lands.
Policy 8.1.2. Agricultural Land Designation.	Protect and support the continued designation and use of agricultural land for agricultural purposes regardless of soil types and capabilities. Locate agricultural structures to maximize the agricultural potential of prime soil resources.
	The property is designated for agricultural use in the OCP.
Policy 8.1.4. Urban Uses.	Direct urban uses to lands within the Permanent Growth Boundary, to minimize development and speculative pressure on agricultural lands.

	The property is located outside of the PGB.
Policy 8.4.1. Intensification of Rural Lands.	Do not support urban uses on lands outside the Permanent Growth Boundary except for as permitted by the 2040 OCP Future Land Use Designations in place as of initial adoption of the 2040 OCP Bylaw..
	The institutional designation is considered an urban use.
Policy 8.4.5. Public Uses on Agricultural Lands.	Discourage the use of agricultural lands for public or institutional uses such as schools, parks and churches except as identified in the 2040 OCP.
	The proposal is for a private institutional use.

6.0 Application Chronology

Date of Application Accepted: September 23, 2022
Date Public Consultation Completed: October 29, 2022

7.0 Alternate Recommendation

THAT Official Community Plan Map Amendment Application No. OCP22-0010 to amend Map 3.1 in the Kelowna 2040 – Official Community Plan Bylaw No. 12300 by changing the Future Land Use designation of Lot 1 District Lot 130 ODYD Plan 8064 located at 2809 Benvoulin Road, Kelowna, BC from the R-AGR - Rural - Agriculture and Resource designation to the EDINST – Education / Institutional designation, be considered by Council;

THAT Rezoning Application No. Z22-0059 to amend the City of Kelowna Zoning Bylaw No. 12375 by changing the zoning classification of Lot 1 District Lot 130 ODYD Plan 8064 located at 2809 Benvoulin Road, Kelowna, BC from the A2 – Agriculture / Rural Residential zone to the P2 – Education and Minor Institutional zone, be considered by Council;

AND THAT the Official Community Plan Amendment and Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Schedule "A" attached to the Report from the Development Planning Department dated October 11, 2022; and

AND FURTHER THAT final adoption of the Rezoning Bylaw be considered in conjunction with Council's consideration of a Form and Character Development.

Report prepared by: Wesley Miles, Planner Specialist
Reviewed by: Dean Strachan, Community Planning & Development Manager
Approved for Inclusion: Terry Barton, Development Planning Department Manager
Approved for Inclusion: Ryan Smith, Divisional Director, Planning & Development Services

Attachments:

Attachment A: Rationale Letter

URBAN OPTIONS
Planning Corp.

ATTACHMENT A
This forms part of application
OCP22-0010/Z22-0059
Planner Initials WM
City of Kelowna
DEVELOPMENT PLANNING

July 12, 2022

City of Kelowna
Attn. Wesley Miles
Urban Planning Department
1435 Water Street
Kelowna, BC

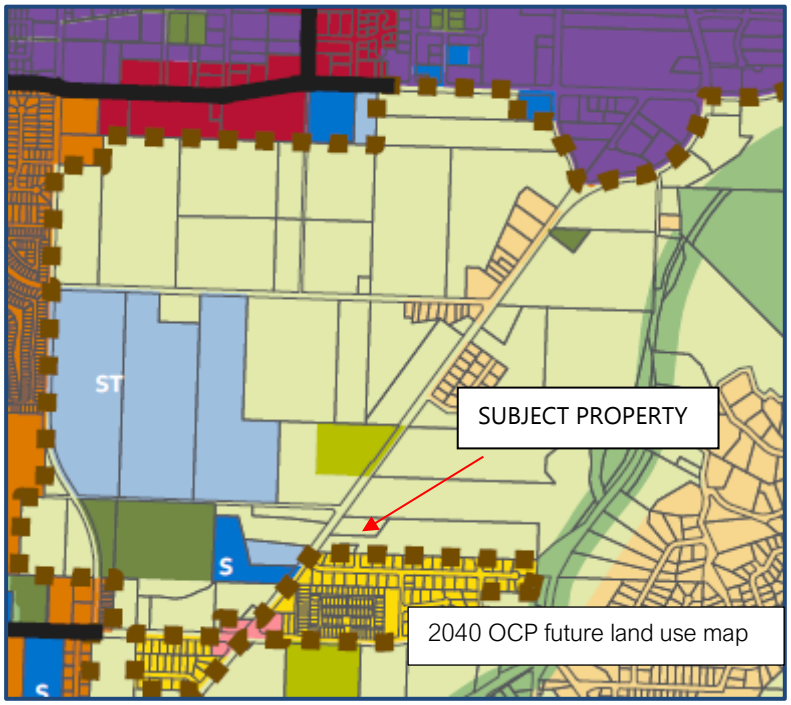
RE: 2809 Benvoulin Road, Gurdwara Guru Amardas Sikh Society Proposal

File no. Z21-0095 and OCP21-0023

Dear Wesley,

We appreciate that the various members of the Planning Department have been working with our group to find a suitable location for a new Gurdwara. The existing location at 220 Davie Road has become too small to serve our Sikh community. Through our mutual investigation, it has been determined that very few locations exist for a place of worship, leading to the exhaustion of all current options. Unfortunately, the original submission for the property at 2090 Byrns Road is no longer an option. The Society has sourced a different site at 2809 Benvoulin Road for the purpose of building a new Gurdwara.

The purpose for this application is to obtain the appropriate approvals to construct a Gurdwara. Specifically, we are seeking to rezone the subject property from A1-Agriculture (outside of the ALR) to P2-Educational and Minor Institutional zone with an associated Official Community Plan amendment from R-AGR Rural Agricultural Resource to EDINST- Education/Institutional. Institutional uses are found in the immediate vicinity including the Heritage Christian School and the Fortis Utility site.



This rationale will outline how the site is ideal for the development of a Gurdwara through social linkages of the Sikh community to agriculture and overall community benefits.

Social Linkage to Agricultural Land

People from the Punjab region of India began immigrating to British Columbia in the 1890's. The majority settled in rural areas (including the Okanagan), working in industries such as forestry and agriculture. Sikhism was founded in northern India (Punjab region), where, for hundreds of years, Sikhs have been integral to farming operations. They are proud farmers and constantly seek opportunities to expand farming. Many local farms are now owned by people in the Sikh faith who are willing to do the difficult and gruelling work, as well as take the risks associated with this occupation.

The Sikh community in Kelowna farms over 2,000+ acres of land. Financial challenges and pressures often arise in the farming industry. As an outlet, it's important for the community to have a location to practice their faith and connect with the community.

History of the Site

The subdivision plan for the property addressed 2809 Benvoulin Road was registered in April 1957, as a 2.25ac (0.91ha) lot, at a time before this area was part of the City of Kelowna. In observing the air photos over the last 20 years, it seems that the agricultural activity on this property has been minor in nature. The property to the south was recently subdivided through an existing Land Use Contract and the land to the east and north are in the ALR. This property is not in the ALR.

History of the Gurdwara Guru Amardas Darbar Sikh Society

Gurdwara Guru Amardas Sikh Society commenced in 1999 and has served the community for the past 20 years with weekly congregations and special events such as weddings, festivals, and religious celebrations. It has become a central hub to gather for worship and fostered a sense of belonging for the Okanagan Sikh community.

Kelowna's population has been growing and is expected to grow for the next decade. It is one of the fastest growing cities in British Columbia with new residents of various ethnicities, including Sikhs, moving to the region from the other parts of British Columbia, Alberta, and Ontario. An increasing number of the Sikh population, through immigration and existing growing families, is making Kelowna their home. With recent growth of the community, the Society is unable to meet with societal demands, and the Sikh community has outgrown its current location.

Development of a larger Gurdwara and providing space that allows communities to flourish will benefit locals as they will have the opportunity to hold weddings in their hometown rather than holding these events in other cities/communities. The current Gurdwara on Davie Road is no longer able to hold large events, including weekly congregations, and general space shortages have become a barrier for regularly holding congregations and events. At these events including the weekly congregations, limited parking has resulted in the congregation parking their vehicles away from the Gurdwara. Parking shortages present a safety and security concern to the congregation and have become an inconvenience to nearby residents. The indoor shared spaces, dining halls, kitchen, and public washrooms are unable to accommodate the size of the community on a usual congregation, resulting in congestion or overcrowding. In addition, visiting preachers often attend special events and require accommodation which is not available.

Proposal

A 2,335m^2 the Gurdwara is proposed for the approximate centre of the property. The proposed site plan features the main access to the site at the end of Boyd Road. There will be a secondary vehicle and pedestrian access directly from Benvoulin Road that will be gated. The secondary entrance will allow for pedestrian/bicycle access through a walkway in the centre and one on the south side of the site.

The proposed building will be 2.5 storeys in height and will cover approximately 8.3% of the site. The site has been carefully developed to ensure that the activities in the Gurdwara will not impact the residential neighbours directly using decorative shrubs, perennials and ornamental grasses and several large deciduous trees. Appropriate parking and creation of ample green spaces are provided with gardens leading to the Gurdwara including seating areas, a rivered water feature and a small plaza at the flag pole. The building will house the Langar Hall (space to receive rest and nourishment), a large Darbar Hall (main worship hall), a smaller Darbar Hall, a large kitchen, youth education rooms, Gurdwara offices, visiting preacher accommodations and all associated utility, washrooms and other needs. The building will be finished in traditional colours and modern design style to match associated Gurdwaras worldwide.

The location is suitable as it is easily accessed using multiple modes of transportation. Benvoulin Road in this location has bike lanes on each side and is also a bus route. The closest transit stop is at the corner of Benvoulin and KLO road approximately 500m to the south. Sidewalks are available from the bus stop to the corner of Fisher Road. Bicycle pathways link to Orchard Park mall on Benvoulin adjacent to the project. Alternatively, a bicycle pathway is located on KLO where worshipers could access through the Fisher Road neighbourhood. Okanagan College (2.0 km west) and the Hospital (3.8km west) are in close proximity.

The proposed redevelopment will provide a direct linkage and connection to agriculture. First and foremost, almost 600m^2 (6458 square feet) of the land would be utilized for a vegetable garden and fruit trees. The land would be cultivated and would generate produce. On the west end of the property, 206 m^2 (2,217 square feet) of land would be used for a vegetable garden. Various types of vegetables would be produced in raised beds (6 feet by 12 feet). The Sikh society will partner with "Bridges to New Life" and donate vegetables to their organization. Due to the specific requirements for the agricultural buffer on the north and west property lines, no fruit trees are planned.

Community Benefits

The Sikh Society, like other faith organizations, promotes prosocial attitudes and behaviours through education and upbringing from senior community members. Children and youth who attend a place of worship put a distinctively high value on a sense of belonging, friendliness, and kindness.

Through avenues such as language classes, summer camps, and cultural activities, children can learn about their religion and history in a fun and engaging way. Engagement promotes prosocial behaviours and values, and principles learned at an early age are often carried later into life and translated to altruistic and humanitarian acts of forgiveness, generosity, and concern for others.

The Sikh society understands and appreciates the City's desire to have the Benvoulin corridor and this parcel connected with farming. In addition to the Gurdwara, the Society proposes to utilize the parcel for agricultural purposes and commits to annually donate 13,000 pounds of fruit to the community. Notices will be provided through social media and local newspapers with the date and time. This fruit will be provided at the subject property 2809 Benvoulin Road. The society hopes to partner with local Kelowna Food Bank and Interior Health branches, where efforts can be targeted to those families that are low income and may not have access to nutritional food.

The Bridge Youth and Family services will be using some of the garden and growing spaces for a horticultural therapy component of their programming (letter attached). It will allow the participants of their program the opportunity to learn about plants and lifecycles and the cycles that are present in their own recovery.

Finally, an outdoor washroom with a shower will be provided for anyone in Kelowna who wants to access a free warm shower, no questions asked. At times there are members of our community who face hardship, we have seen articles in local newspapers of individuals living out of their vehicles. While they have access to toilet, a hot shower they do not. This connection fits well with the Gurdwara, as the third Guru (Guru Amardas), would collect water in the early morning and provide that for the second Guru (Guru Angad Dev Ji) for twenty-three years. Security measures will be in place to ensure appropriate use of the washroom.

The development of the new Gurdwara will enable the society to better serve the members and offer space for the community to grow resulting in a prosperous society. Moreover, this expansion will allow our local Sikh population to flourish and be a social and economic benefit to the city and surrounding areas. By integrating traditions out of the Sikh faith and welcoming the surrounding community to participate and benefit from the uses at the site, the Sikh society will be a good neighbour.

We look forward to bringing this project to Council for their consideration and welcome any feedback. Please contact, Birte Decloux, Urban Options planning directly at 250.575.6707.

Regards,

Birte Decloux, RPP MCIP
Urban Options Planning Corp. on behalf of the Guru Amardas Sikh Society

OCP22-0010 / Z22-0059
2809 Benvoulin Road

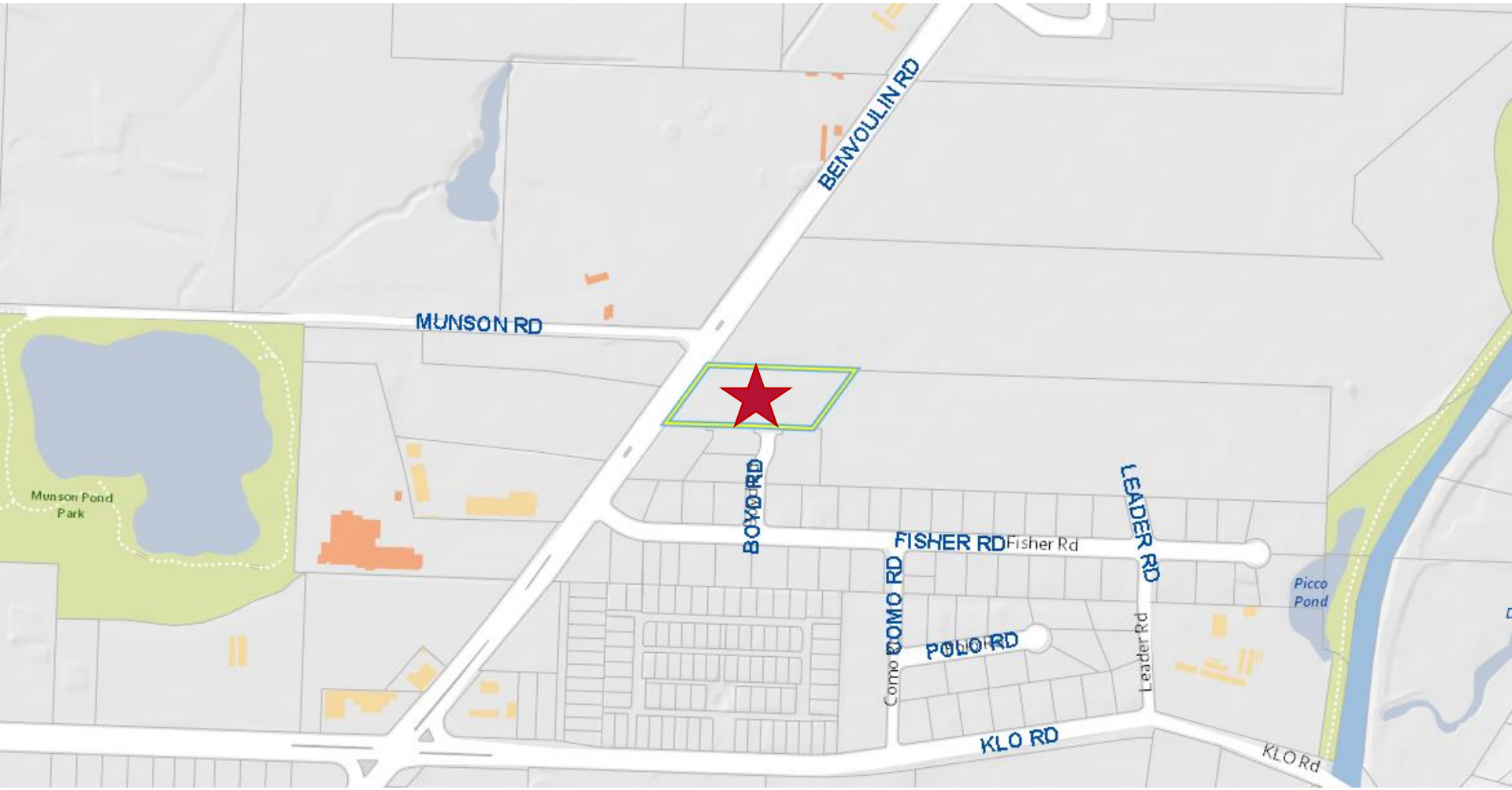
Official Community Plan and Rezoning Amendment

Proposal

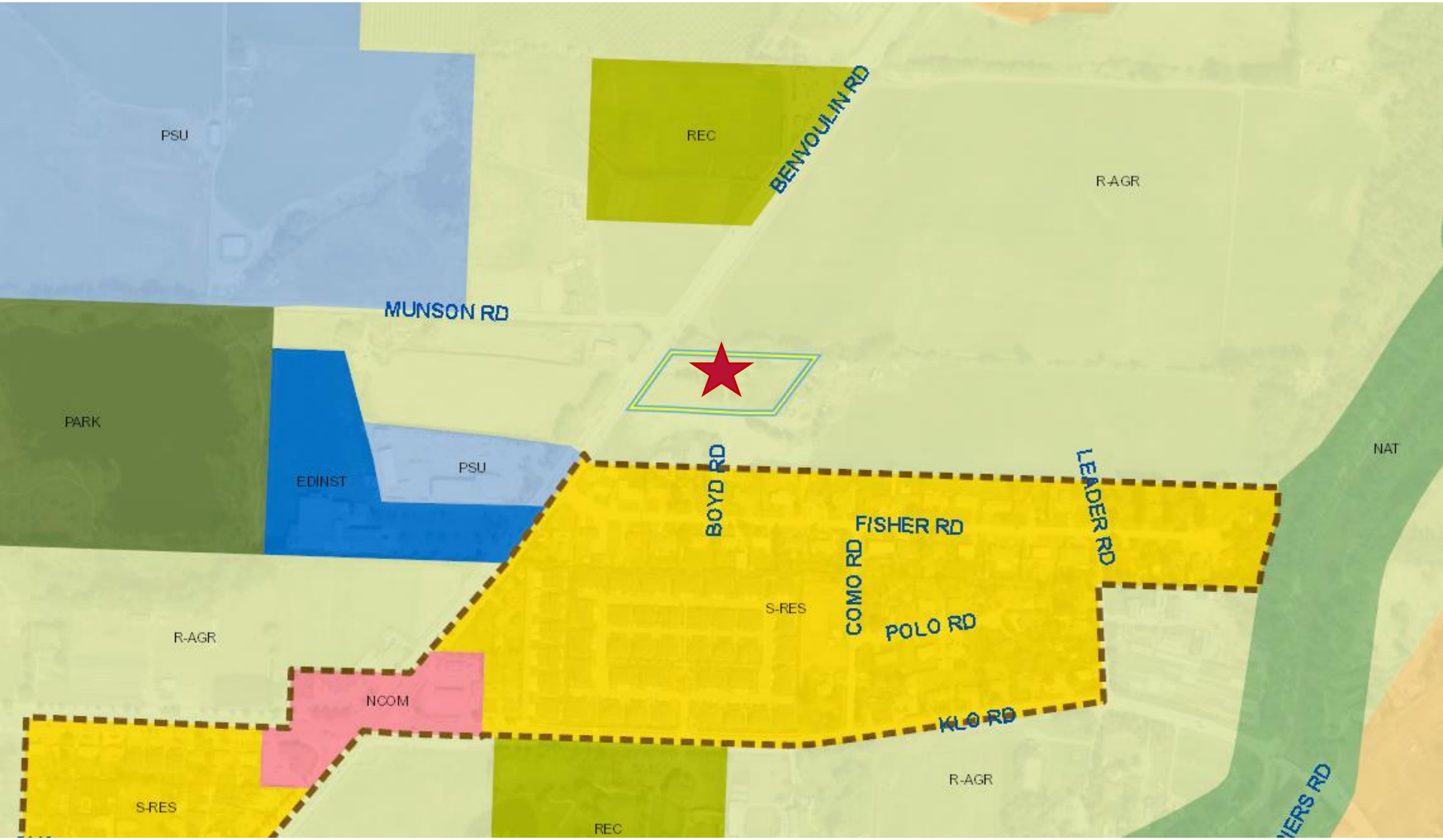
- To change the Future Land Use designation of the subject property from R-AGR - Rural - Agriculture and Resource designation to the EDINST – Education / Institutional designation
- To rezone the subject property from the A2 – Agriculture / Rural Residential zone to the P2 – Educational and Minor Institutional zone

Development Process

Context Map

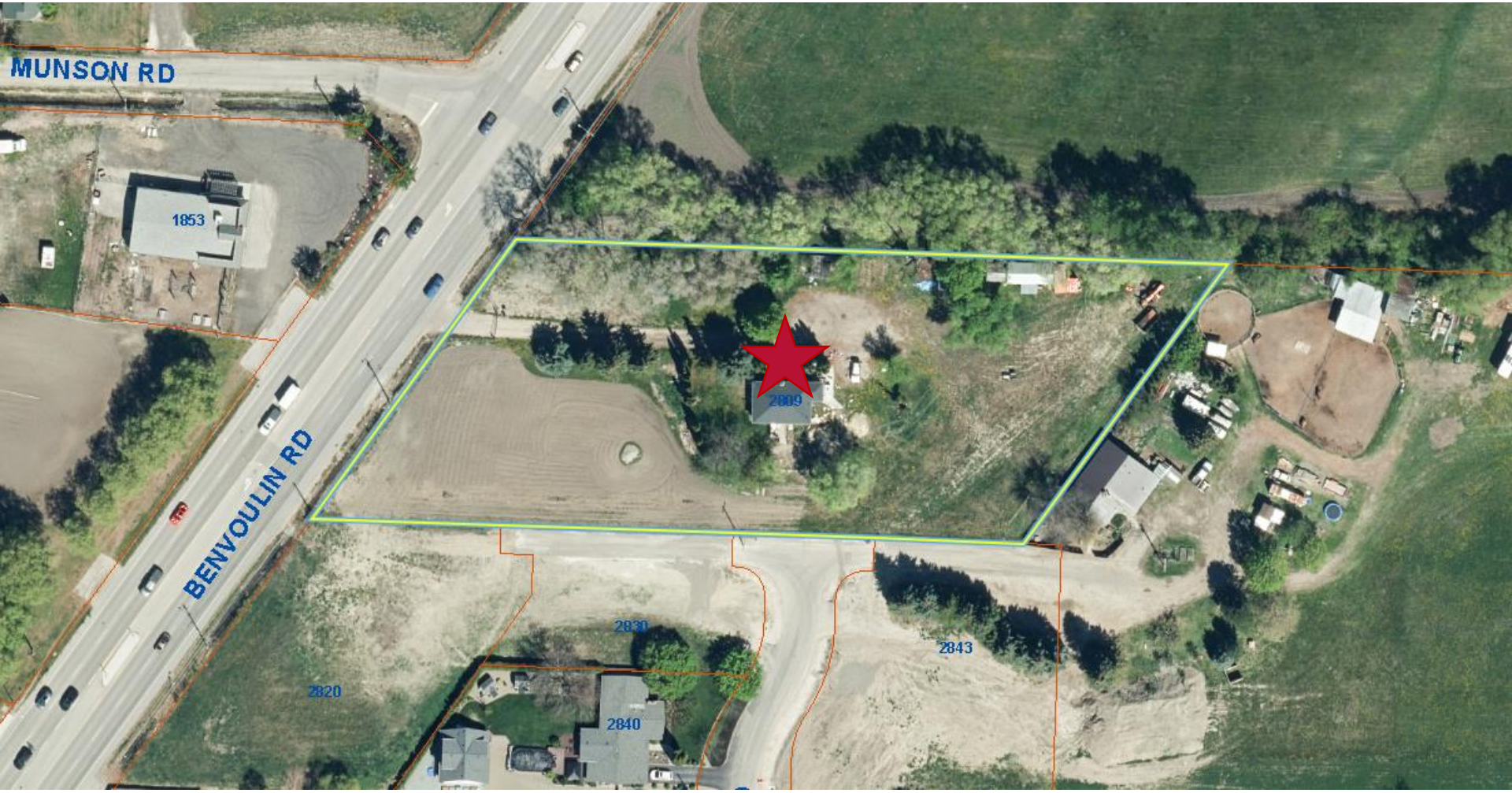

BENVOULIN RD
MUNSON RD
Munson Pond Park
BOYD RD
FISHER RD
Fisher Rd
LEADER RD
COMO RD
POLO RD
Leader Rd
Picco Pond
KLO RD
KLO Rd

OCP Future Land Use / PGB



Agricultural Land Reserve

Subject Property Map



General project details

- 2,335 m2, 2.5 storey building
- Parking and landscaping around the perimeter
- Primary access from Boyd Road
- Vegetated agricultural buffer would be required on the north and east property boundaries
- Form and Character Development Permit is required to be approved by Council if the proposal were to proceed.

Development Policy

The Big Picture: 10 Pillars to Realize our Vision

1. **Protect Agriculture -** Agriculture has played a crucial role in Kelowna's economy for generations and is a big part of Kelowna's identity. Local food production is also becoming even more important in the face of a changing climate. As such, protecting agricultural lands is key goal of Imagine Kelowna. The Official Community Plan supports this critical component of our economy, identity and food security by limiting urban growth into agricultural lands and supporting their viability.

Objective 8.1. Protect and preserve agricultural land and its capability.	
Policy 8.1.1. Protect Agricultural Land.	Retain the agricultural land base by supporting the ALR and by protecting agricultural lands from development. Ensure that the primary use of agricultural land is agriculture, regardless of parcel size.
	The property is 2.25 ac is size and could be utilized for agricultural purposes. It is not located the Agricultural Land Reserve, however the property is still considered agricultural and is directly adjacent to ALR lands.
Policy 8.1.2. Agricultural Land Designation.	Protect and support the continued designation and use of agricultural land for agricultural purposes regardless of soil types and capabilities. Locate agricultural structures to maximize the agricultural potential of prime soil resources.
	However not the Agricultural Land Reserve, the property is still considered and designated for agricultural use.
Policy 8.1.4. Urban Uses.	Direct urban uses to lands within the Permanent Growth Boundary, to minimize development and speculative pressure on agricultural lands.
	The property is located outside of the PGB.
Policy 8.4.1. Intensification of Rural Lands.	Do not support urban uses on lands outside the Permanent Growth Boundary except for as permitted by the 2040 OCP Future Land Use Designations in place as of initial adoption of the 2040 OCP Bylaw..
	The institutional designation is considered an urban use.
Policy 8.4.5. Public Uses on Agricultural Lands.	Discourage the use of agricultural lands for public or institutional uses such as schools, parks and churches except as identified in the 2040 OCP.
	The proposal is for a private religious assembly/institutional use.

Public Notification Policy #367

- Describe how the applicant has completed public notification to comply with the Council Policy
  - Public notification and open houses were completed in October 2022

Staff Recommendation

- Staff are recommending non-support of the proposed Official Community Plan and rezoning amendment
  - Does not meet overall policies of the OCP for rural or agricultural areas
  - Located outside the PGB
  - Public or private Institutional uses including churches or places of religious assembly are not supported on rural or agricultural land

City of Kelowna

Conclusion of Staff Remarks

REPORT TO COUNCIL

Date:	April 24, 2023		
To:	Council		
From:	City Manager		
Department:	Development Planning		
Application:	TA22-0018	**Owner:**	ASI BARBER ROAD GP INC., INC.NO. A0122606
Address:	135 Barber Rd, 155 Barber Rd and 765 Hwy 33 W	**Applicant:**	ASI BARBER ROAD GP INC.
Subject:	Text Amendment Application		
Existing OCP Designation:	UC – Urban Centre		
Existing Zone:	UC4 – Rutland Urban Centre		

1.0 Recommendation

THAT Zoning Bylaw Text Amendment Application No. TA22-0018 to amend City of Kelowna Zoning Bylaw No. 12375 as outlined in Schedule "A" attached to the Report from the Development Planning Department dated April 24, 2023 for LOT 1 SECTION 22 TOWNSHIP 26 OSOYOOS DIVISION YALE DISTRICT PLAN 17229 EXCEPT PLAN 39372 located at 765 Hwy 33 W, LOT 2 SECTION 22 TOWNSHIP 26 OSOYOOS DIVISION YALE DISTRICT PLAN 17229 located at 135 Barber Rd and LOT 3 SECTION 22 TOWNSHIP 26 OSOYOOS DIVISION YALE DISTRICT PLAN 17229 located at 155 Barber Rd be considered by Council;

AND THAT the Zoning Bylaw Text Amending Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT final adoption of the Zoning Bylaw Text Amending Bylaw be considered subsequent to the approval of the Ministry of Transportation and Infrastructure;

AND FURTHER THAT final adoption of the Rezoning Bylaw be considered in conjunction with Council's consideration of a Development Permit and Development Variance Permit for the subject property.

2.0 Purpose

To amend the Zoning Bylaw with a Site-Specific Text Amendment to permit ground-floor commercial uses to occupy a minimum of 0% of the Hwy 33 W street frontage.

3.0 Development Planning

Staff recommend support for this Site-Specific Text Amendment application. Map 4.8 in the 2040 Official Community Plan (OCP) identifies the envisioned street character of roads within the Rutland Urban Centre. The portion of Hwy 33 W, fronting these properties, is identified as a Retail Street in the OCP. The street character of Hwy 33 W changes to Mixed-Residential Street to the west of Barber Rd, and Barber Rd is identified as a Residential Street. Given the Residential Street designation for Barber Rd, Staff feel the request to not include any commercial uses for this proposed development is reasonable. There are other locations within the Rutland Urban Centre that are appropriate for commercial uses, and as this proposed development is on the edge of the Retail Street Character Map, Planning feels this request would not deteriorate from establishing commercial in the heart of the Rutland Urban Centre.

Zoning Bylaw No. 12375 (Section 14.11) requires a minimum of 90% of the street frontage to be ground-floor commercial. As the request for the proposal to not include any commercial use pertains to the removal of a land-use requirement, this request cannot be handled as a variance and needs to be processed as a site-specific text amendment, in accordance with Local Government Act S. 498(2)(a).

4.0 Site Context & Background

4.1 Site Context

Orientation	Zoning	Land Use
North	P1 – Major Institutional P2 – Education and Minor Institutional UC4dt-fg – Rutland Urban Centre (Drive Through and Fuelling and Gas Stations)	Apartment Housing Health Services Gas Bar, Food Primary with Drive Through
East	UC4dt-rcs - Rutland Urban Centre (Drive Through and Retail Cannabis Sales)	Retail, Retail Cannabis Sales
South	RU1 – Large Lot Housing	Single Detached Housing
West	UC4 – Rutland Urban Centre	Apartment Housing Single Detached Housing

Subject Property Map: 135 Barber Rd, 155 Barber Rd and 765 Hwy 33 W

4.2 Background

The development proposal is for the three lots on the northeast corner of Barber Rd at Hwy 33 W, which front on to Hwy 33 W. They currently contain single detached housing.

5.0 Technical Comments

5.1 Development Engineering Department

Development Engineering Requirements are associated with the related Development Permit (DP22-0225)

6.0 Application Chronology

Date of Application Accepted: November 24, 2022
Date Public Consultation Completed: February 18, 2023

Report prepared by: Kimberly Brunet, Planner II
Reviewed by: Jocelyn Black, Urban Planning Manager
Reviewed by: Terry Barton, Development Planning Department Manager
Approved for Inclusion: Ryan Smith, Divisional Director, Planning & Development Services

Attachments:

Schedule A: Site-Specific Text Amendment Table

Schedule A – Proposed Text Amendments

<table>
<tr><th>No.</th><th>Section</th><th>Current Wording</th><th>Proposed Wording</th><th>Reason for Change</th></tr>
<tr><td>11.</td><td>Section 14.15 Site Specific Regulations</td><td>N/A</td><td>Section 14.15 Site Specific Regulations
Uses and regulations apply on a site-specific basis as follows:

<table>
<tr><th>Legal Description</th><th>Civic Address</th><th>Regulation</th></tr>
<tr><td>LOT 1 SECTION 22 TOWNSHIP 26 OSOYOOS DIVISION YALE DISTRICT PLAN 17229 EXCEPT PLAN 39372

LOT 2 SECTION 22 TOWNSHIP 26 OSOYOOS DIVISION YALE DISTRICT PLAN 17229

LOT 3 SECTION 22 TOWNSHIP 26 OSOYOOS DIVISION YALE DISTRICT PLAN 17229</td><td>765 Hwy 33 W

135 Barber Rd

155 Barber Rd</td><td>To permit:
• ground-floor commercial principal uses to occupy 0% of the Hwy 33 W street frontage</td></tr>
</table>
</td><td>To not require any ground-floor commercial uses on the Hwy 33 W frontage</td></tr>
</table>

City of Kelowna

TA22-0018

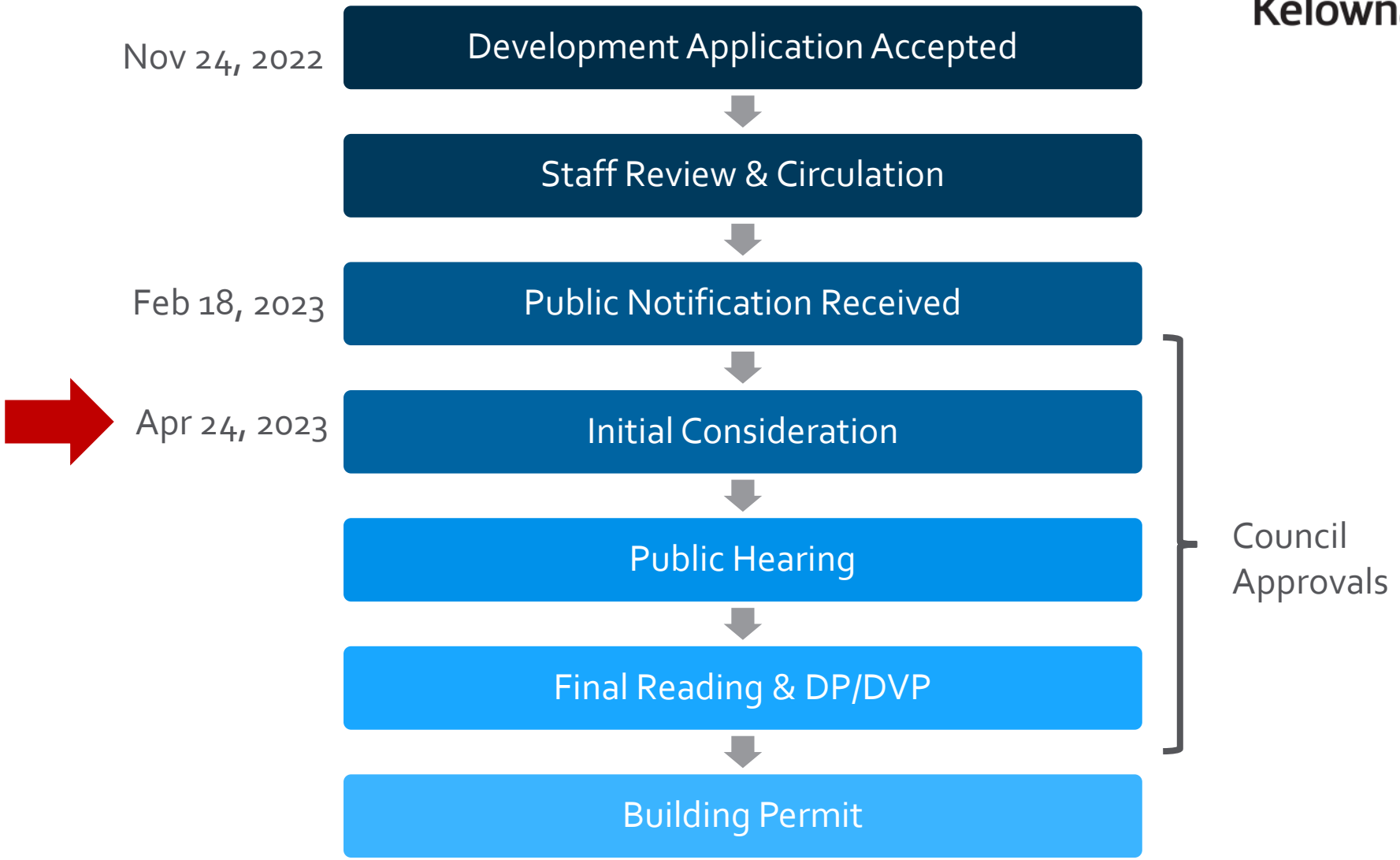
135 Barber Rd, 155 Barber Rd and 765 Hwy 33 W

Site-Specific Text Amendment Application

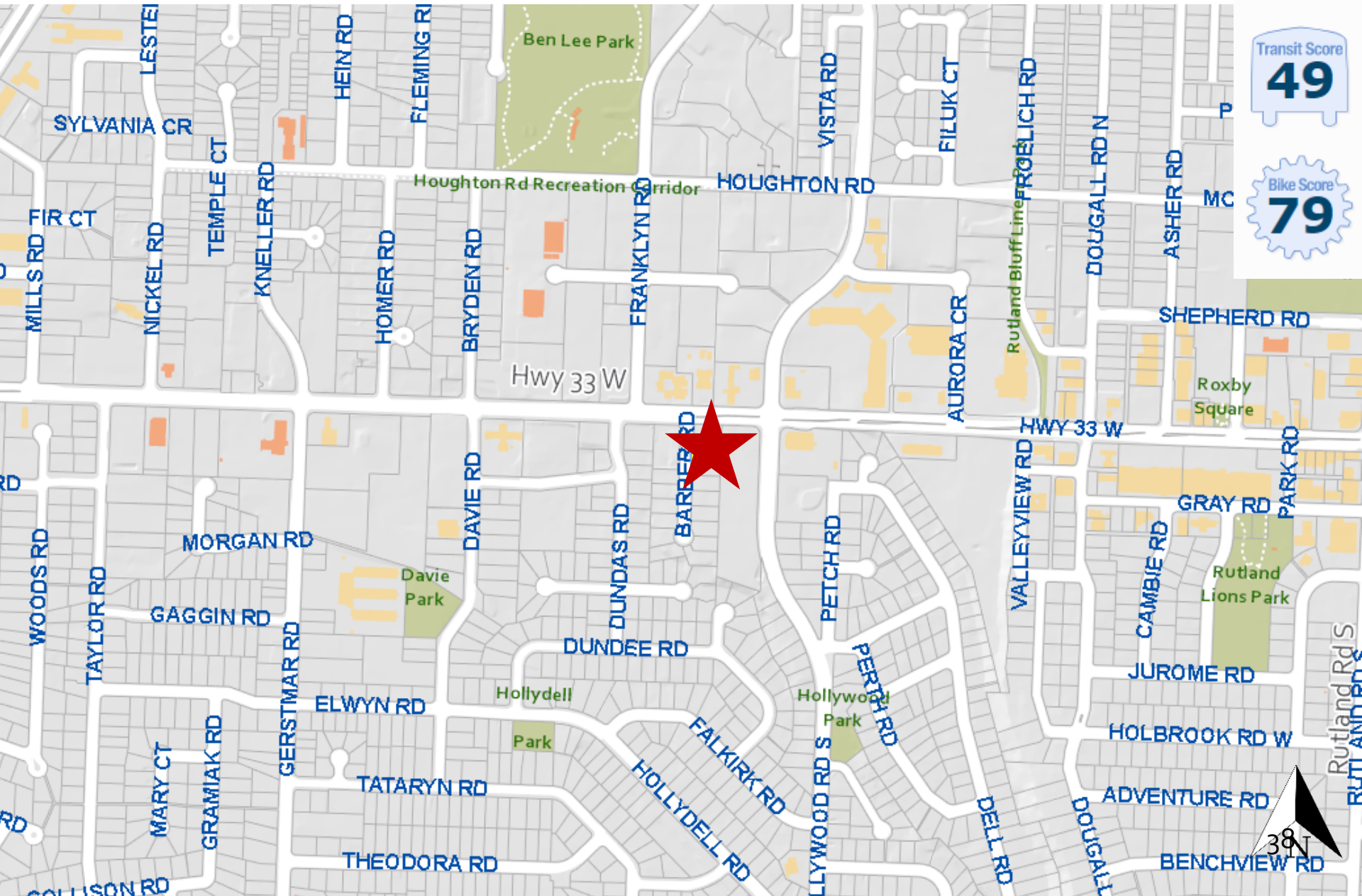
Purpose

- To amend the Zoning Bylaw by permitting ground-floor commercial uses to occupy a minimum of 0% of the Hwy 33 W street frontage.

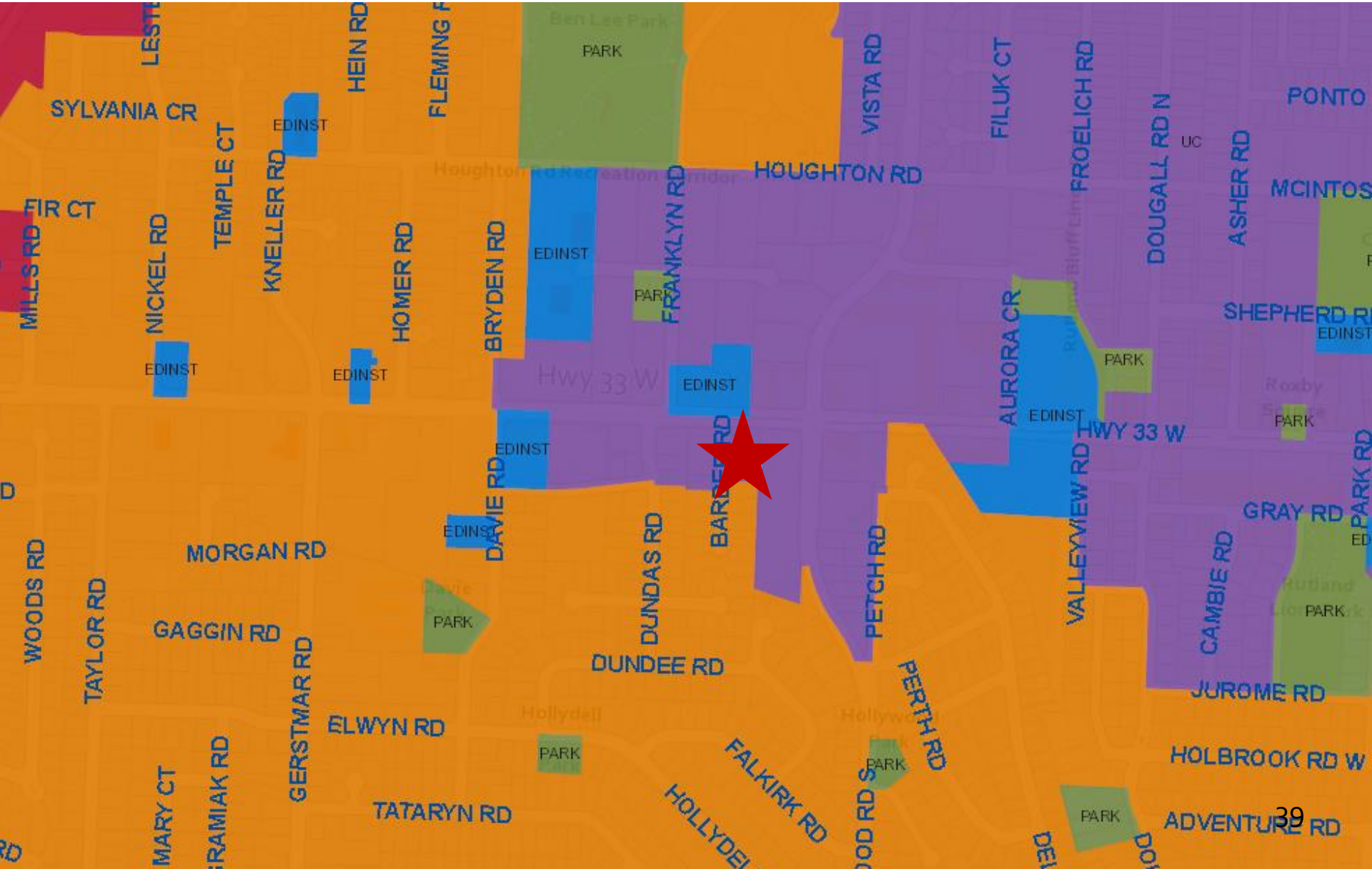
Development Process



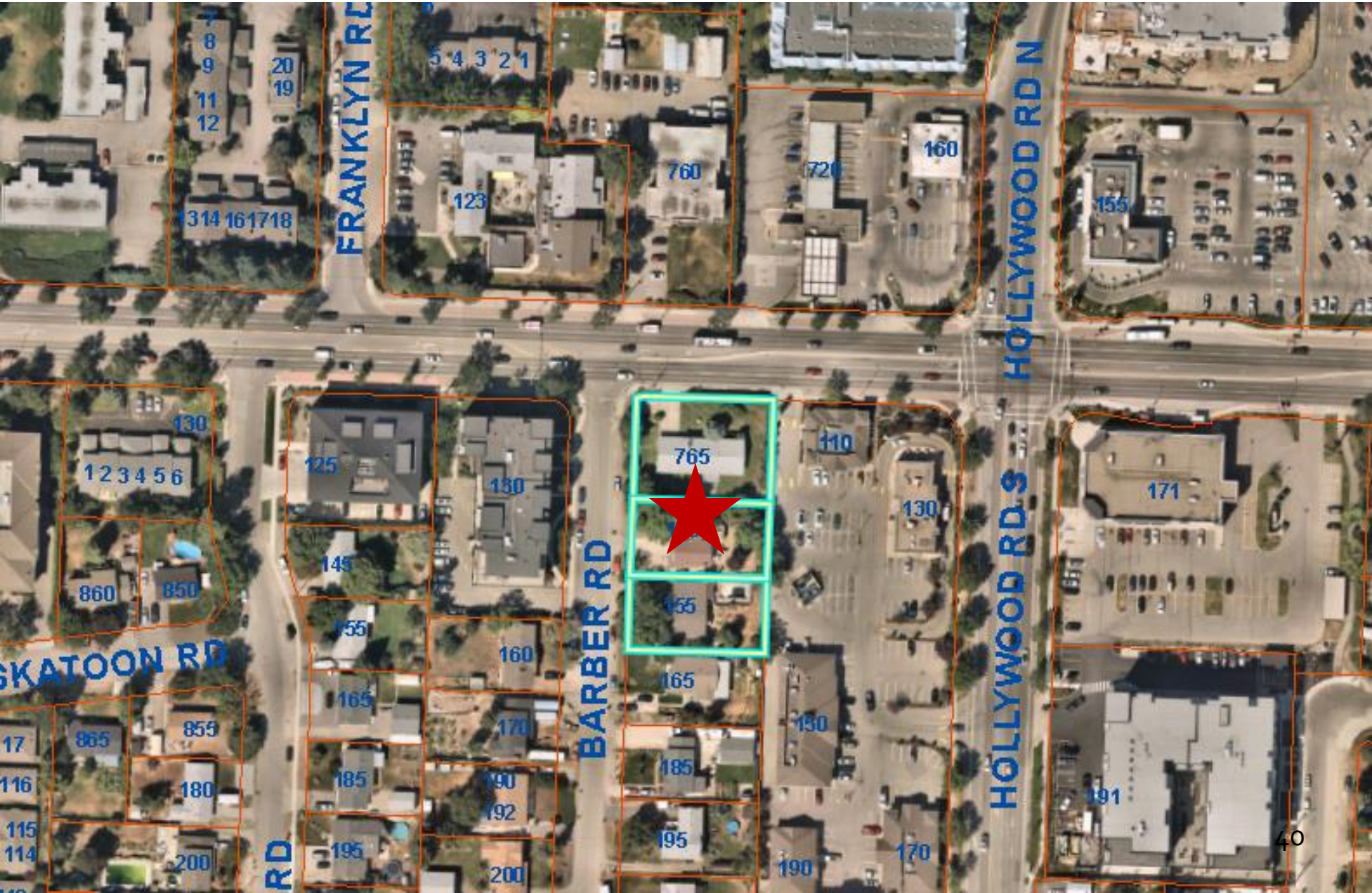
Context Map


Walk Score 79
Transit Score 49
Bike Score 79
Ben Lee Park
Houghton Rd Recreation Corridor
HOUGHTON RD
Hwy 33 W
HWY 33 W
SHEPHERD RD
GRAY RD
JUROME RD
HOLBROOK RD W
ADVENTURE RD
BENCHVIEW RD
DUNDEE RD
ELWYN RD
TATARYN RD
THEODORA RD
GAGGIN RD
MORGAN RD
SYLVANIA CR
FIR CT
MILLS RD
NICKEL RD
TEMPLE CT
KNELLER RD
HEIN RD
FLEMING RD
HOMER RD
BRYDEN RD
FRANKLYN RD
DAVIE RD
DUNDAS RD
BARBER RD
VISTA RD
FILUK CT
FROELICH RD
DOUGALL RD N
ASHER RD
AURORA CR
Rutland Bluff Linear Park
VALLEYVIEW RD
PETCH RD
PERTH RD
CAMBIE RD
PARK RD
Roxby Square
Rutland Lions Park
Davie Park
Hollydell Park
Hollywood Park
WOODS RD
TAYLOR RD
GERSTMAR RD
GRAMIAK RD
MARY CT
FALKIRK RD
HOLLYDELL RD
HOLLYWOOD RD S
DELL RD
Rutland Rd S
38 N

OCP Future Land Use

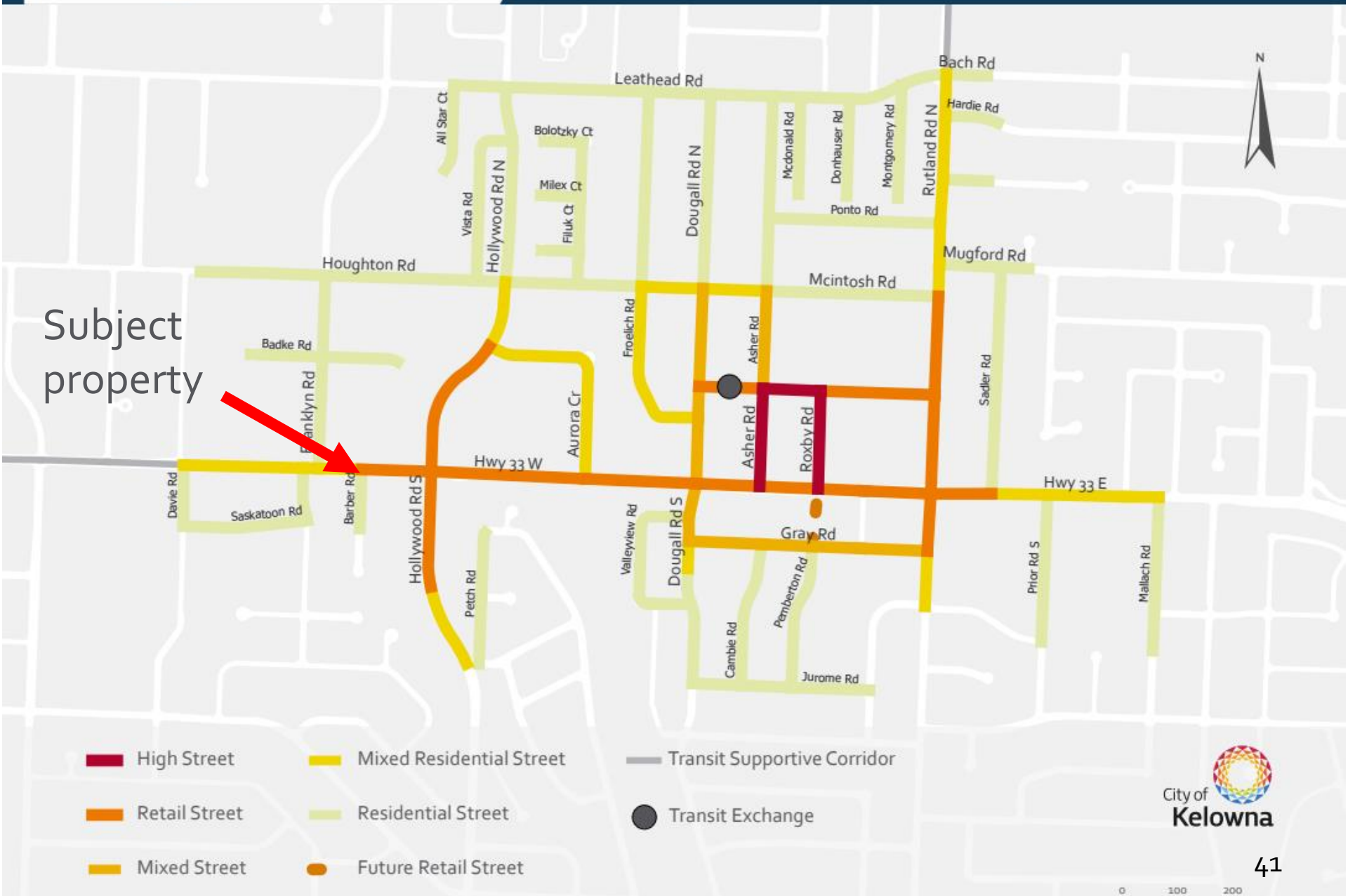


Subject Property Map



2040 Official Community Plan

Map 4.8 Rutland Street Character



Rev. Sept. 8, 2021

Site-Specific Text Amendment

- To permit ground-floor commercial uses to occupy a minimum of 0% of the Hwy 33 W street frontage
  - Required to be processed as a text amendment, in accordance with LGA S. 498(2)(a)

Staff Recommendation

- Staff recommend support for the proposed site-specific text amendment application.
  - Properties are located on the western edge of the OCP Retail Street Character
  - Barber Rd is identified as a Residential Street
  - Request would not deteriorate from establishing commercial in the Rutland Urban Centre

CITY OF KELOWNA

BYLAW NO. 12514
TA22-0018
135, 155 Barber Road & 765 HWY 33 W

A bylaw to amend the "City of Kelowna Zoning Bylaw No. 12375".

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. THAT City of Kelowna Zoning Bylaw No. 12375, **Section 14 – Core Area and Other Zones, Section 14.15 – Site Specific Regulations** be amended by adding in its appropriate location the following:

"

Section 14.15 Site Specific Regulations Uses and Regulations apply on a site-specific basis as follows:			
	Legal Description	Civic Address	Regulation
11.	LOT 1 SECTION 22 TOWNSHIP 26 OSOYOOS DIVISION YALE DISTRICT PLAN 17229 EXCEPT PLAN 39372	765 HWY 33 W	To permit ground floor commercial principal uses to occupy 0% of the Hwy 33 W street frontage
	LOT 2 SECTION 22 TOWNSHIP 26 OSOYOOS DIVISION YALE DISTRICT PLAN 17229	135 Barber Rd	
	LOT 3 SECTION 22 TOWNSHIP 26 OSOYOOS DIVISION YALE DISTRICT PLAN 17229	155 Barber Rd	

"

2. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first time by the Municipal Council

Considered at a Public Hearing on this

Read a second and third time by the Municipal Council this

Approved under the Transportation Act this

(Approving Officer – Ministry of Transportation)

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

REPORT TO COUNCIL

Date:	April 24, 2023		
To:	Council		
From:	City Manager		
Department:	Development Planning		
Application:	TA23-0003	**Owner:**	B.C. Life Builders Rehabilitation Society, Inc.No.S-0037307
Address:	2473 Ethel St	**Applicant:**	Tom Smithwick
Subject:	Text Amendment		
Existing OCP Designation:	C-NHD - Core Area Neighbourhood		
Existing Zone:	RU4b – Duplex Housing with Boarding or Lodging House		

1.0 Recommendation

THAT Zoning Bylaw Text Amendment Application No. TA23-0003 to amend City of Kelowna Zoning Bylaw No. 12375 as outlined in Schedule "A" attached to the Report from the Development Planning Department dated April 24, 2023 for Lot B District Lot 136 ODYD Plan 30919 located at 2473 Ethel Street be considered by Council;

AND THAT the Zoning Bylaw Text Amending Bylaw be forwarded to a Public Hearing for further consideration.

2.0 Purpose

To amend the Zoning Bylaw by adding a site-specific text amendment to allow Boarding or Lodging House within an accessory building, a reduction in minimum parking space requirements, and a maximum of 14 residents on the subject property.

3.0 Development Planning

Staff are supportive of the site-specific text amendment. The site is currently operating as a Boarding House with 11 bedrooms within the principal dwelling unit, 10 for residents and one for an employee. The accessory building will contain an additional four bedrooms. All residents share a communal kitchen within the principal dwelling unit.

The non-profit organization operating the site does not permit residents to have vehicles on site. Staff members have vehicles on-site and work with residents to attend appointments and basic needs.

Additionally, residents use public transport or cycling, therefore, a reduction in required parking from 10 stalls to 2 stalls is appropriate for this site.

4.0 Proposal

4.1 Background

A Building Permit was issued in November 2010 to construct the accessory building on the subject property (BP41409). Currently the Boarding House operates in the Single Detached Housing building only.

4.2 Project Description

The proposed site-specific text amendment would allow the use of Boarding or Lodging to operate within an accessory structure. In the RU4b zone the existing accessory building on site has been used in the past for garage and workshop space. A building permit would be required for the change of use to create conditioned space.

4.2 Site Context

The subject property is located on Ethel Street between Morrison Avenue and Grenfell Avenue. The property fronts onto the Ethel Street multi-use corridor.

Specifically, adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	RU1 – Large Lot Housing	Single Detached Housing
East	RU1 – Large Lot Housing	Single Detached Housing
South	RU4 – Duplex Housing	Duplex Housing
West	MF1 – Infill Housing	Duplex Housing

Subject Property Map: 2473 Ethel Street

5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Objective 5.11 Increase the diversity of housing forms and tenure to create an inclusive, affordable and complete Core Area.	
Policy 5.11.1 Diverse Housing Forms	Ensure a diverse mix of low and medium density housing forms in the Core Area that support a variety of households, income levels and life stages.
	The operator of the Boarding house is a non-profit and works with residents with a variety of income levels and different stages of life.
Objective 5.12 Protect citizens from displacement due to Core Area development	
Policy 5.12.1 Housing with Supports	Prioritize the development of subsidized housing and housing with supports in the Core Area in addition to the Urban Centres, particularly near employment, public transit, services and amenities. Promote acceptance to the community for these supports, services and the citizens that are using them.
	The Boarding house has been operating out of the principle dwelling for several years. It is well established in the neighbourhood and benefits from nearby amenities.

6.0 Application Chronology

Date of Application Accepted: January 17, 2023
Date Public Consultation Completed: March 1, 2023

Report prepared by: Jason Issler, Planner I
Reviewed by: Jocelyn Black, Urban Planning Manager
Reviewed by: Terry Barton, Development Planning Department Manager
Approved for Inclusion: Ryan Smith, Divisional Director, Planning & Development Services

Attachments:

Schedule A: Proposed Text Amendment

Schedule A – Proposed Site-Specific Text Amendments to Zoning Bylaw No. 12375 TA23-0003

<table>
<tr><th>No.</th><th>Section</th><th>Current Wording</th><th>Proposed Wording</th><th>Reason for Change</th></tr>
<tr><td>1.</td><td>Section 11.6 – Site Specific Regulations, RU4b – Duplex Housing (Boarding and Lodging)</td><td>N/A</td><td>
<table>
<tr><th colspan="4">Section 11.6 – Site Specific Regulations Uses and regulations apply on a site-specific basis as follows:</th></tr>
<tr><th></th><th>Legal Description</th><th>Civic Address</th><th>Regulation</th></tr>
<tr><td>1.</td><td>Lot B District Lot 136 ODYD Plan 30919.</td><td>2473 Ethel Street</td><td>Notwithstanding, Section 5.3 General Definitions, & Table 8.3.1a Other Residential Parking, the following uses and regulations are permitted:
Boarding and Lodging Houses can operate within an accessory building in addition to the Single Detached Housing; and
The minimum parking is two stalls for the Boarding and Lodging use for the site; and
The maximum of 14 residents on the subject property.</td></tr>
</table>
</td><td>To allow Boarding and Lodging use to operate within accessory building and provide two parking stalls.</td></tr>
</table>

SCHEDULE A
This forms part of application
TA23-0003
Planner Initials JI
City of Kelowna
DEVELOPMENT PLANNING

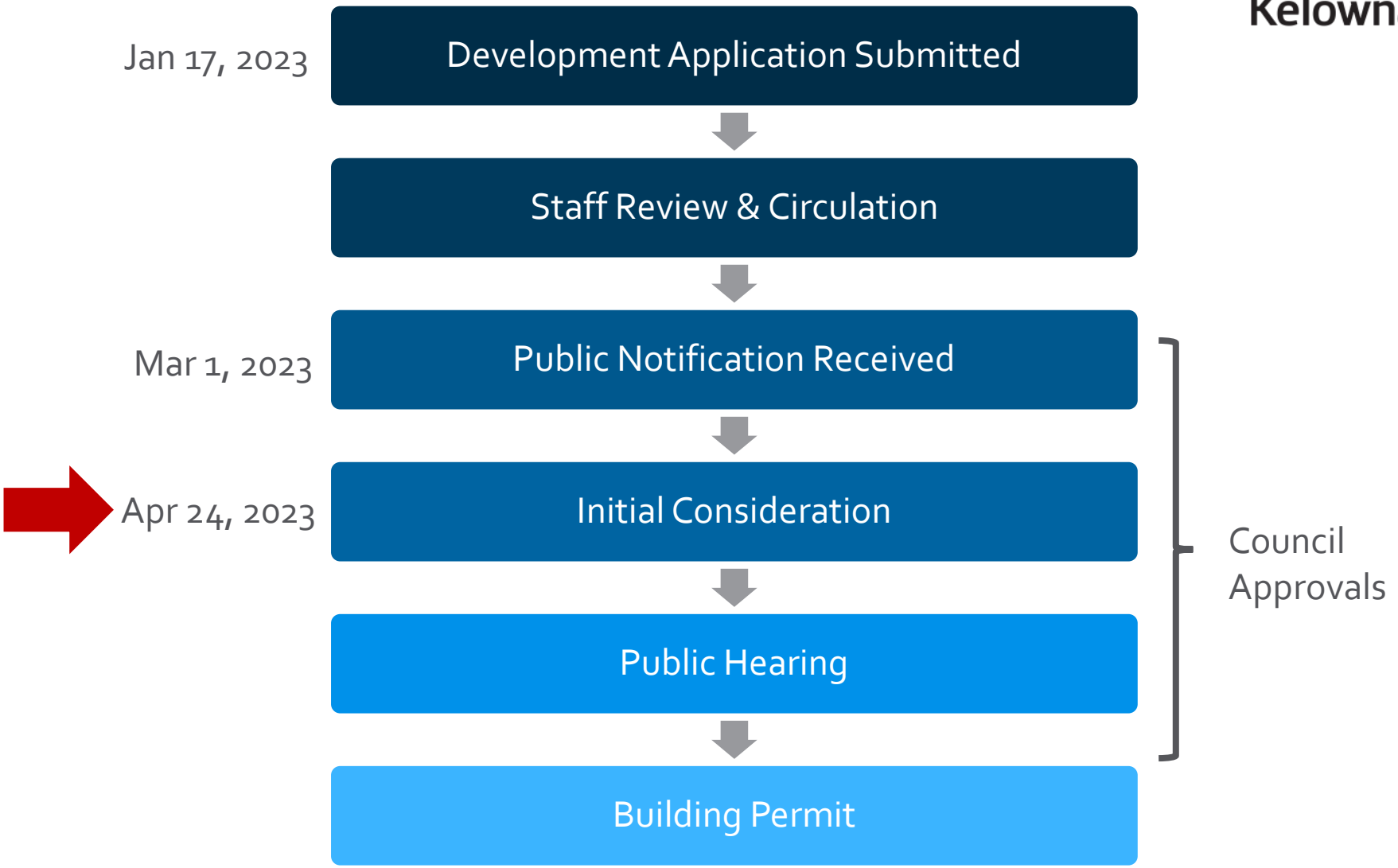
TA23-0003
2473 Ethel St

Text Amendment Application

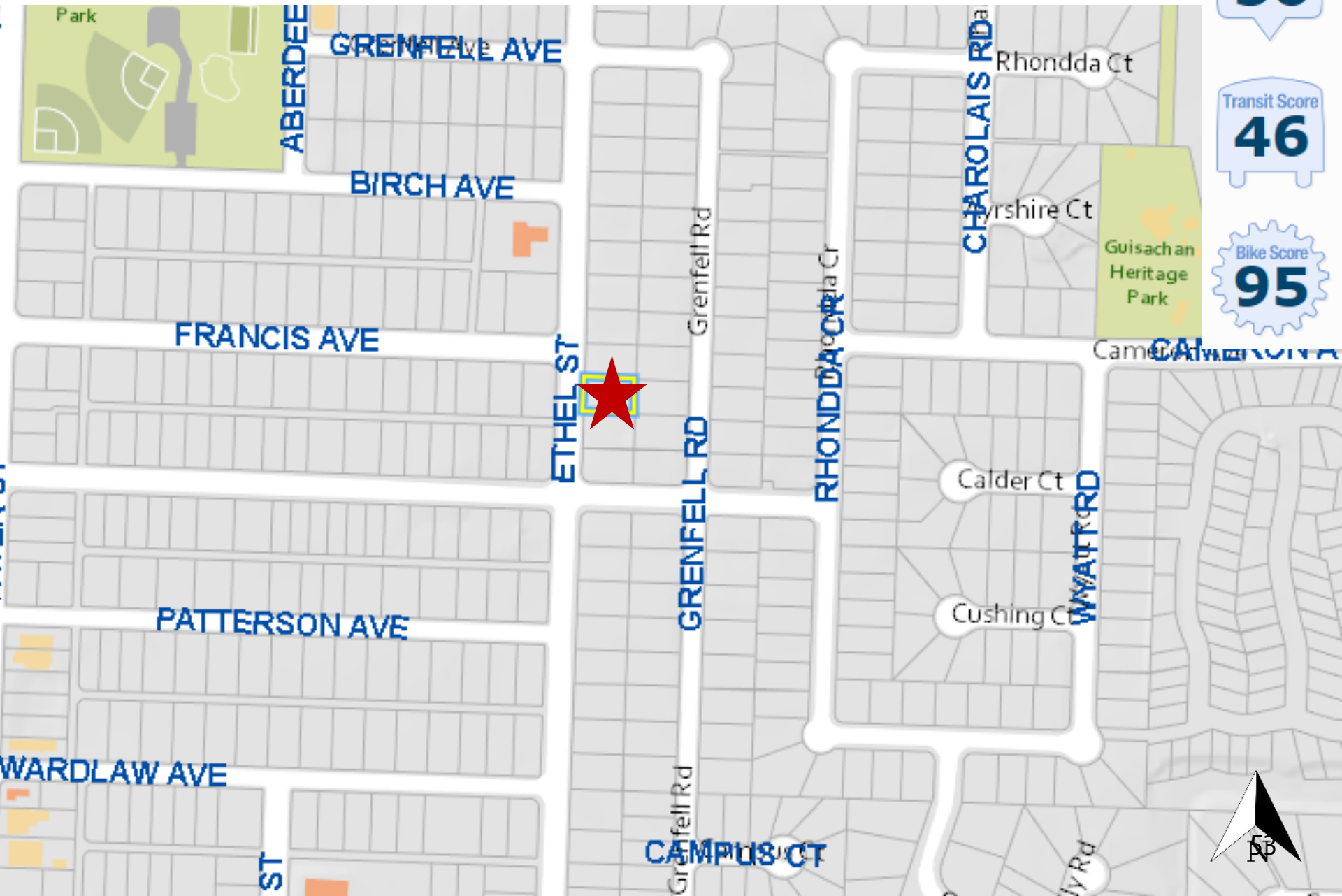
Purpose

- To amend the zoning bylaw by adding a site-specific text amendment to Zoning Bylaw No. 12375 to allow Boarding or Lodging House within an accessory building, a reduction in minimum parking space requirements, and a maximum of 14 residents on the subject property.

Development Process

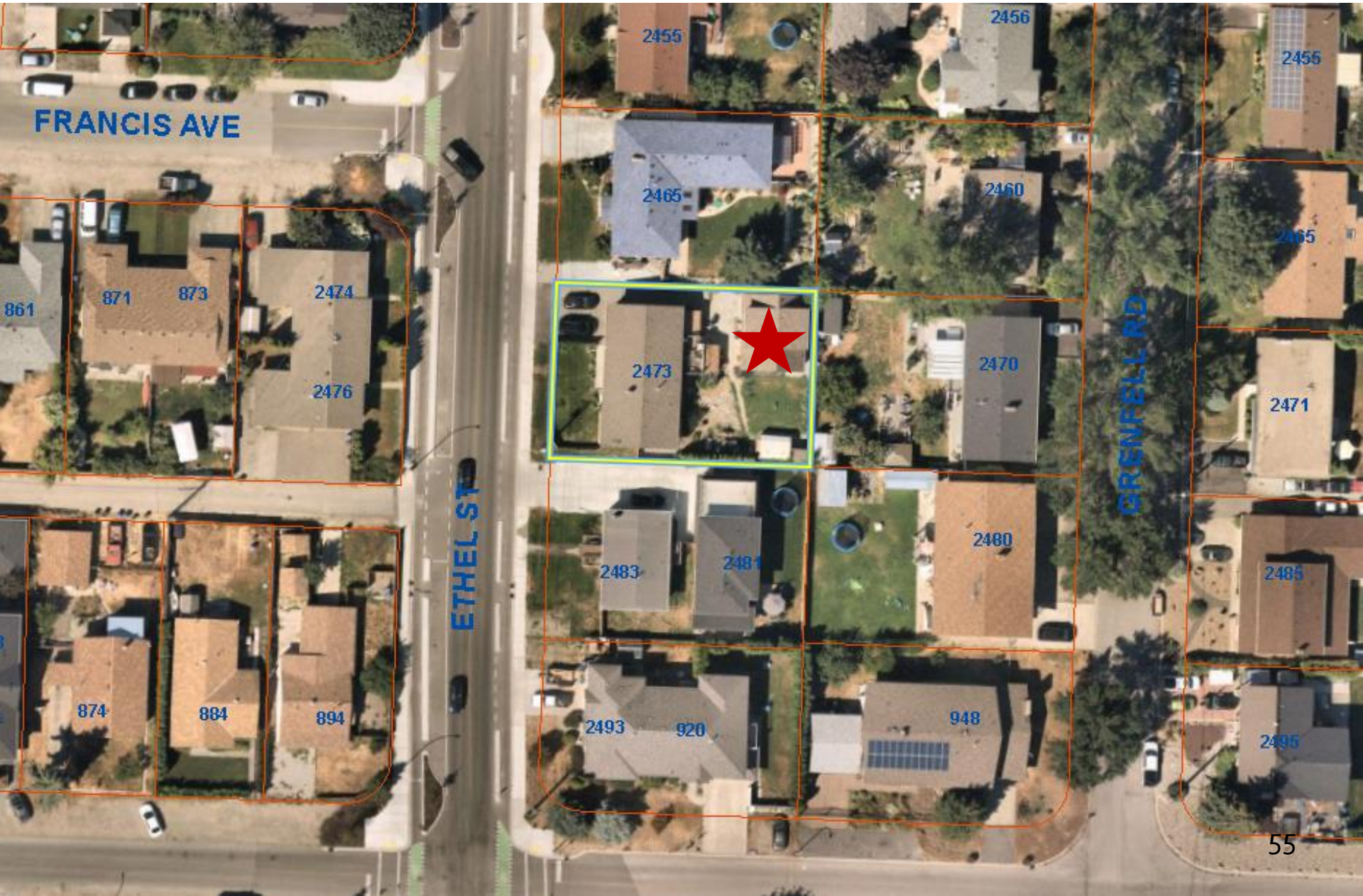


Context Map


Walk Score
56
Transit Score
46
Bike Score
95
Park
GRENFELL AVE
ABERDEEN
BIRCH AVE
FRANCIS AVE
ETHEL ST
Grenfell Rd
GRENFELL RD
RHONDDA CR
CHAROLAIS RD
Rhondda Ct
Ayrshire Ct
Guisachan Heritage Park
Calder Ct
WYATT RD
Cushing Ct
PATTERSON AVE
WARDLAW AVE
CAMPUS CT
N
53

OCP Future Land Use

Subject Property Map



Project Details

- To permit Boarding or Lodging House within accessory building
- C-NHD – Core Area Neighbourhood
- Boarding or Lodging House
  - 11 Bedrooms in the house (10 residents 1 employee)
  - 4 new rooms proposed in accessory building
  - 2 parking stalls for employees
  - 14 residents total onsite

OCP Objectives & Policies

- Policy 5.11.1 Diverse Housing Forms
  - Supports variety of income levels and stages of life.
- Policy 5.12.1 Housing with Supports
  - Part of the neighbourhood for several years and benefits from nearby amenities.

Staff Recommendation

- Staff recommend **support** for the proposed Text Amendment as it is consistent with:
  - OCP Future Land Use C-NHD
  - OCP Objectives in Chapter 5 Core Area
    - Diverse Housing Forms
    - Housing with Supports

CITY OF KELOWNA

BYLAW NO. 12515
TA23-0003
2473 Ethel St

A bylaw to amend the "City of Kelowna Zoning Bylaw No. 12375".

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. THAT City of Kelowna Zoning Bylaw No. 12375, **Section 11 – Single and Two Dwelling Zones,** be amended by adding **Section 11.6 – Site Specific Regulations** in its appropriate location as follows:

"

Section 11.6 – Site Specific Regulations Uses and regulations apply on a site-specific basis as follows:			
	Legal Description	Civic Address	Regulation
1.	Lot B District Lot 136 ODYD Plan 30919	2473 Ethel Street	*Notwithstanding, Section 5.3 General Deinitions, & Table 8.3.1a Other Residential Parking,* the following uses and regulations are permitted: • Boarding and Lodging Houses can operate within an accessory building in addition to the Single Detached Housing; and • The minimum parking is two stalls for the Boarding and Lodging use for the site; and • The maximum of 14 residents on the subject property

"

2. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first time by the Municipal Council

Considered at a Public Hearing on this

Read a second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

REPORT TO COUNCIL

Date:	April 24th 2023		
To:	Council		
From:	City Manager		
Department:	Development Planning		
Application:	DP22-0236	**Owner:**	New Opportunities for Women (NOW) Canada Society Inc No S-39119
Address:	2609-2611 Richter Street	**Applicant:**	Jesse Alexander – New Town Services
Subject:	Development Permit		
Existing OCP Designation:	UC- Urban Centre		
Existing Zone:	UC5- Pandosy Urban Centre		

1.0 Recommendation

THAT Council authorizes the issuance of Development Permit No. DP22-0236 for Lot 2, District Lot 135, ODYD, Plan 3929, located at 2609-2611 Richter Street, Kelowna, BC subject to the following:

1. The dimensions and siting of the building to be constructed on the land be in accordance with Schedule "A";
2. The exterior design and finish of the building to be constructed on the land be in accordance with Schedule "B";
3. Landscaping to be provided on the land be in accordance with Schedule "C";
4. The applicant be required to post with the City a Landscape Performance Security deposit in the amount of 125% of the estimated value of the Landscape Plan, as determined by a Registered Landscape Architect;

AND THAT the applicant be required to complete the above noted conditions of Council's approval of the Development Permit Application in order for the permits to be issued;

AND FURTHER THAT this Development Permit is valid for two (2) years from the date of Council approval, with no opportunity to extend.

2.0 Purpose

To issue a Development Permit for the form and character of a 5-storey building offering a women's shelter and supportive housing services.

3.0 Development Planning

Staff support the proposed Development Permit for the form and character of the five-storey supportive housing and women's shelter building. The 5-storey proposal is consistent with the Official Community Plan (OCP) Building Height policy maximum of 6 storeys and is consistent with the OCP's Street Character of a Residential Street. The proposal meets all regulations of the Zoning Bylaw. Thus, no variances are requested.

The proposal is also consistent with the OCP Form and Character Design Guidelines for Low-Rise Apartment Developments including an attractive ground floor lobby interface with Richter Street, adequate landscaping with the landscape interface areas, the provision of the private open space, and the inclusion of varied architectural features on the building's façade.

The owner, NOW Canada Society, are providing an important social function by proposing a place of refuge with an integrated continuum of care ranging from emergency shelter services to supportive housing units. This project is funded by BC Housing to provide shelter and below-market rental housing options to women and children.

This project will provide needed housing options to a vulnerable segment of the population and is consistent with the Official Community Plan's desired height and density within the Pandosy Urban Centre. The project is located within an Urban Centre that provides close access to schools, parks, commercial centre, transit, bicycle facilities, and nearby children playground equipment, all of which support this more intensive development on this lot.

4.0 Proposal

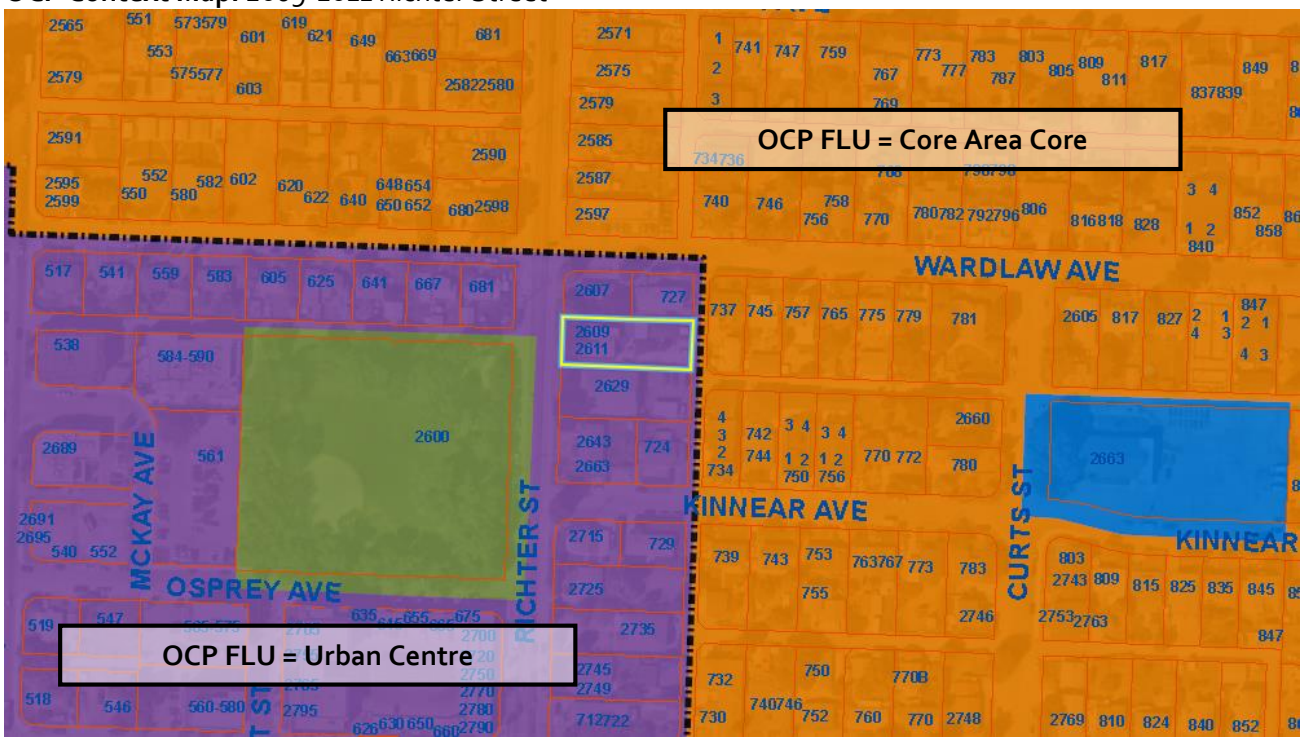
4.1 Project Description

The project is designed in a contemporary style with a modern appearance. The project has a mix of high quality cladding materials including: a variety of coloured fiber cement panels, a lux aluminum wood grain vertical material, and a brick veneer along the front portion of the building. The building steps back on both sides above the second storey to reduce the massing impact on adjacent properties. Parking is accessed from the rear lane and is the primary component of the first floor. Shelter services will be located on the second floor with supportive housing dwelling units on floor three through five.

4.2 Site Context

Subject Property Map: 2609-2611 Richter Street

OCP Context Map: 2609-2611 Richter Street



4.3 Zoning Analysis Table

Zoning Analysis Table		
CRITERIA	**UC5 ZONE REQUIREMENTS**	**PROPOSAL**
Existing Lot/Subdivision Regulations		
Min. Lot Area	n/a	1,050.5 m²
Development Regulations		
Max. Floor Area Ratio	1.8	1.3
Max. Site Coverage (buildings)	85%	71.5%
Max. Site Coverage (buildings & impermeable surfaces)	90%	87%
Max. Height	22m / 6 storeys	18.4m / 5 storeys
Minimum Setbacks below the 16 metre level		
Min. Front Yard	3.0 m	4.7 m
Min. Side Yard (north)	0.0 m	1.5 m
Min. Side Yard (south)	0.0 m	0.0 m
Min. Rear Yard	0.0 m	3.6 m
Minimum Setbacks above the 16 metre level		
Min. Front Yard	3.0 m	4.7 m
Min. Side Yard (north)	4.0 m	4.0 m
Min. Side Yard (south)	4.0 m	4.0 m
Min. Rear Yard	0.0 m	3.6 m
Minimum Vehicular Parking		
Min. Parking Requirements for Supportive Housing	12	12
Min. Parking Requirements for Employees	3	3
Min. Parking Requirements for Visitors	5	5
Minimum Regular Vehicle Stall Ratio	50%	53%
Maximum Small Vehicle Stall Ratio	50%	47%
Min. Loading Space	0	0
Minimum Bicycle Parking		
Min. Long Term Bicycle Parking for Supportive Housing	3	8
Min. Short Term Bicycle Parking	6	6

5.0 Current Development Policies

Objective 4.9. Transition sensitively to adjacent neighbourhoods and public spaces.	
Policy 4.9.2. Transitioning to Core Area Neighbourhoods	Use height and scale to ensure that buildings avoid height cliffs and shadowing, transitioning gradually to adjacent Corey Area Neighbourhoods
	The subject property borders the future land use designation of Core Area Neighbourhood. The OCP Building Heights map permits 6 storeys on this property therefore the reduced height of five-storeys helps with shadowing and height cliffs.

Objective 4.12. Increase the diversity of housing types and tenures to create inclusive, affordable and complete Urban Centres.	
Policy 4.12.1. Diverse Housing Forms	Ensure a diverse mix of **medium-density** and **high-density** housing forms that support a variety of households, income levels and life stages.
Policy 4.12.3 Diverse Housing Tenures	Encourage a range of rental and ownership tenures that support a variety of households, income levels and life stages. Promote underrepresented forms of tenure, including but not limited to co-housing, fee-simple row housing, co-ops, and rent-to-own.
	The proposal is proposing a unique shelter and supportive housing proposal for women and children which is encouraged by the diverse housing forms and tenures OCP policies.
Objective 4.13. Protect citizens from displacement due to Urban Centre development.	
Policy 4.12.1. Housing with Supports.	Prioritize the development of subsidized housing and housing with supports in the **Urban Centres** in addition to the **Core Area**, particularly near employment, public transit, services and amenities. Promote acceptance by the community for these supports, services and the citizens that are using them.
	The proposal is proposing supportive housing within the Pandosy Urban Centre.

6.0 Application Chronology

Date of Application Received: December 16th 2022
Date Public Consultation Completed: n/a

Report prepared by: Adam Cseke, Planner Specialist

Reviewed by: Jocelyn Black, Urban Planning Manager

Reviewed by: Terry Barton, Development Planning Department Manager

Approved for Inclusion: Ryan Smith, Divisional Director, Planning & Development Services

Attachments:

Attachment A: Draft Development Permit DP22-0236

Schedule A: Site Plan and Floor Plans

Schedule B: Elevations

Schedule C: Landscape Plan

Attachment B: OCP Form and Character Development Permit Guidelines

Attachment C: Applicant Rationale

Development Permit

DP22-0236

This permit relates to land in the City of Kelowna municipally known as

2609-2611 Richter Street

and legally known as

Lot 2, District Lot 135, ODYD, Plan 3929

and permits the land to be used for the following development: Shelter and Supportive Housing

The present owner and any subsequent owner of the above described land must comply with any attached terms and conditions.

Date of Council Approval:	**April 24th 2023**
Development Permit Area:	Form and Character Development Permit Area
Existing Zone:	UC5 – Pandosy Urban Centre
Future Land Use Designation:	UC – Urban Centre

This Development Permit is valid for two (2) years from the date of approval, with no opportunity to extend.

This is NOT a Building Permit.

In addition to your Development Permit, a Building Permit may be required prior to any work commencing. For further information, contact the City of Kelowna, Development Services Branch.

NOTICE

This permit does not relieve the owner or the owner's authorized agent from full compliance with the requirements of any federal, provincial or other municipal legislation, or the terms and conditions of any easement, covenant, building scheme or agreement affecting the building or land.

Owner:	New Opportunities for Women (NOW) Canada Society
Applicant:	Jesse Alexander – New Town Services

_____

Terry Barton
Development Planning Department Manager
Planning & Development Services

_____

Date of Issuance

ATTACHMENT A
This forms part of application
DP22-0236
City of Kelowna
DEVELOPMENT PLANNING
Planner Initials AC

1. SCOPE OF APPROVAL

This Development Permit applies to and only to those lands within the Municipality as described above, and any and all buildings, structures and other development thereon.

This Development Permit is issued subject to compliance with all of the Bylaws of the Municipality applicable thereto, except as specifically varied or supplemented by this permit, noted in the Terms and Conditions below.

The issuance of a permit limits the permit holder to be in strict compliance with regulations of the Zoning Bylaw and all other Bylaws unless specific variances have been authorized by the Development Permit. No implied variances from bylaw provisions shall be granted by virtue of drawing notations that are inconsistent with bylaw provisions and that may not have been identified as required Variances by the applicant or Municipal staff.

2. CONDITIONS OF APPROVAL

THAT Council authorizes the issuance of Development Permit No. DPP22-0236 for Lot 2, District Lot 135, ODYD, Plan 3929, located at 2609-2611 Richter Street, Kelowna, BC, subject to the following:

a) The dimensions and siting of the building to be constructed on the land be in accordance with Schedule "A";

b) The exterior design and finish of the building to be constructed on the land be in accordance with Schedule "B";

c) Landscaping to be provided on the land be in accordance with Schedule "C";

d) The applicant be required to post with the City a Landscape Performance Security deposit in the amount of 125% of the estimated value of the Landscape Plan, as determined by a Registered Landscape Architect;

3. PERFORMANCE SECURITY

As a condition of the issuance of this Permit, Council is holding the security set out below to ensure that development is carried out in accordance with the terms and conditions of this Permit. Should any interest be earned upon the security, it shall accrue to the Developer and be paid to the Developer or his or her designate if the security is returned. The condition of the posting of the security is that should the Developer fail to carry out the development hereby authorized, according to the terms and conditions of this Permit within the time provided, the Municipality may use enter into an agreement with the property owner of the day to have the work carried out, and any surplus shall be paid over to the property owner of the day. Should the Developer carry out the development as per the conditions of this permit, the security shall be returned to the Developer or his or her designate following proof of Substantial Compliance as defined in Bylaw No. 12310. There is filed accordingly:

a) An Irrevocable Letter of Credit **OR** certified cheque **OR** a Surety Bond in the amount of **$32,069.62 (The Landscape estimate of $25,655.70 x 125%)**

Before any bond or security required under this Permit is reduced or released, the Developer will provide the City with a statutory declaration certifying that all labour, material, workers' compensation and other taxes and costs have been paid.

4. INDEMNIFICATION

Upon commencement of the works authorized by this Permit the Developer covenants and agrees to save harmless and effectually indemnify the Municipality against:

a) All actions and proceedings, costs, damages, expenses, claims, and demands whatsoever and by whomsoever brought, by reason of the Municipality said Permit.

All costs, expenses, claims that may be incurred by the Municipality where the construction, engineering or other types of works as called for by the Permit results in damages to any property owned in whole or in part by the Municipality or which the Municipality by duty or custom is obliged, directly or indirectly in any way or to any degree, to construct, repair, or maintain.

The PERMIT HOLDER is the <u>CURRENT LAND OWNER</u>.
Security shall <u>ONLY</u> be returned to the signatory of the Landscape Agreement or their designates.

NOW Canada - Women's Shelter

RE-ISSUED FOR DP, 2023-03-10

SCHEDULE A & B
This forms part of application
DP22-0236
Planner Initials AC
City of Kelowna
DEVELOPMENT PLANNING

ARCHITECTURAL

NEW TOWN ARCHITECTURE & ENGINEERING
200-1464 ST. PAUL STREET
KELOWNA, BC V1Y 2E6
e: roman@newtownservices.net t: (250) 860-8185

CIVIL ENGINEERING

NEW TOWN ARCHITECTURE & ENGINEERING
200-1464 ST. PAUL STREET
KELOWNA, BC V1Y 2E6
e: jacob@newtownservices.ca t: (250) 860-8185

LANDSCAPE

MK DESIGN GROUP
1101 SPRING CREEK DR
CANMORE, AB T1W 0M6
e: milana@mk-designgroup.com t: (778) 955-8995

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ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING
www.newtownservices.ca

Seal

REGISTERED ARCHITECT ROMAN YAMCHISHYN BRITISH COLUMBIA

Revisions

No.	DATE	DESCRIPTION
4	2023-03-10	RE-ISSUED FOR DP

project title
NOW CANADA - WOMEN'S SHELTER
project address
2609 RICHTER STREET

project legal description
LOT 2 DISTRICT LOT
135 PLAN KAP3929

project no. 4165
file no. C:\Users\Jenna\Documents\4165 NOW WS - Central_jenna2RBJP.rvt

drawing title
COVER PAGE

designed Designer
scale
drawn Author
checked Checker
drawing no. A0.00D
plotted 3/10/23 2:23:59 PM

PROJECT NAME

ADDRESS:
2609 RICHTER STREET, KELOWNA, V1Y 2R3, BRITISH COLUMBIA, CANADA

LEGAL ADDRESS:
LOT 2 DISTRICT LOT 135 PLAN KAP3929

GRADES:
EXISTING: FLAT — PROPOSED: FLAT

NUMBER OF BUILDINGS:
ONE BUILDING

ZONING ANALYSIS

EXISTING:	**PROPOSED:**
UC5 - PANDOSY URBAN CENTRE	N/A
FUTURE LAND USE (2040 OCP)	UC - CORE AREA NEIGHBOURHOOD
TRANSIT SUPPORTED CORRIDOR	NO

ADJACENT LAND USES:	**ZONE**	**USE**
NORTH	P4	TELEPHONE
SOUTH	MF1	RESIDENTIAL
EAST	UC5	RESIDENTIAL
WEST	P3	PARK

UC5 ZONING REQUIREMENTS

REQUIRED:	**PROPOSED:**
SITE AREA (m²)	
460m²	1,050.47m²
SITE WIDTH (m)	
13.0m	19.72m
SITE DEPTH (m)	
30.0m	52.95m
MAXIMUM SITE COVERAGE FOR BUILDINGS (%)	
85%	71.5%
MAXIMUM SITE COVERAGE FOR BUILDINGS, STRUCTURES & IMPERMEABLE SURFACES (%)	
90%	87.0%
VEHICULAR ACCESS FROM LANE OR LOWER CLASSED ROAD	
	REAR LANE

DEVELOPMENT REQUIREMENTS

REQUIRED:		**PROPOSED:**
TOTAL NUMBER & TYPES OF UNITS:		
N/A		34 UNITS
FLOOR AREA (GFA/NFA)(m²):		
1890.85m² MAXIMUM (BASED ON 1.8 FAR)		1350.27m² (740.69 GFA FOR SITE COVERAGE)
FLOOR AREA RATIO:		
1.8		1.29
BUILDING HEIGHT (m):		
22m / 6 STOREYS		18.4m / 5 STOREYS
SETBACKS (m):		
FRONT (WEST)	3.0m	4.7m
SIDE A (NORTH)	0.0m	0.0m
SIDE B (SOUTH)	0.0m	0.0m
BACK (EAST)	0.0m	3.6m
SETBACKS OVER 16M		
FRONT (WEST)	3.0m	4.7m
SIDE A (NORTH)	4.0m	4.0m
SIDE B (SOUTH)	4.0m	4.0m
BACK (EAST)	0.0m	3.6m
PARKING STALLS:		
0.35 PER SLEEPING UNIT		12 STALLS (0.35 x 34 = 11.9)
0.5 STALLS PER NON-RESIDENT ON DUTY EMPLOYEE OR 3.0 STALLS (WHICHEVER IS GREATER)		3 STALLS
VISITOR		
0.14 PER DWELLING UNIT		5 STALLS (0.14 x 34 = 4.76)
TOTAL (MIN REQUIRED)		*20 STALLS*
TOTAL (PROVIDED)		**20 STALLS**
DRIVE AISLE (WIDTH)	6.0 - 6.5m	6.0 - 6.9m
DRIVE AISLE GRADE	8%	1-2%
REGULAR STALL RATIO	50%	50%
SMALL STALL RATIO	50%	50%
BIKE STALLS:		
1.0 PER 20 DWELLING UNITS		2 STALLS (34/20 = 1.7)
1.0 PER 10 EMPLOYEES		1 STALL
VISITOR (6 PER ENTRANCE)		6 STALLS
TOTAL (MIN REQUIRED)		*9 STALLS*
TOTAL (PROVIDED)		**14 STALLS**

NORTH

SPECIFIC BUILT FORMS

	REQUIRED:	**PROPOSED:**
GROUND ORIENTED:		
REDUCED SETBACK	2.0m	N/A
MAX. 1st FLOOR HEIGHT	1.2m	N/A
MIN. 1st FLOOR AREA	11m²	N/A
URBAN & VILLAGE CENTRE (14.11):		
UPPER FLOOR SETBACK ABUTTING STREET	3.0m	4.7m
CORNER LOT TRIANGULAR SETBACK	N/A	N/A
URBAN PLAZA	Y / N	NO

VIEW FROM RICHTER STREET

VIEW FROM REAR LANE

ISSUED FOR PERMIT

SCHEDULE A & B
This forms part of application
DP22-0236
Planner Initials AC
City of Kelowna DEVELOPMENT PLANNING

NEW TOWN
ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING
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Seal

REGISTERED ARCHITECT STEPHEN YAMCHISHYN PROFESSIONAL ENGINEER BRITISH COLUMBIA

Revisions

No.	DATE	DESCRIPTION
4	2023-03-10	RE-ISSUED FOR DP

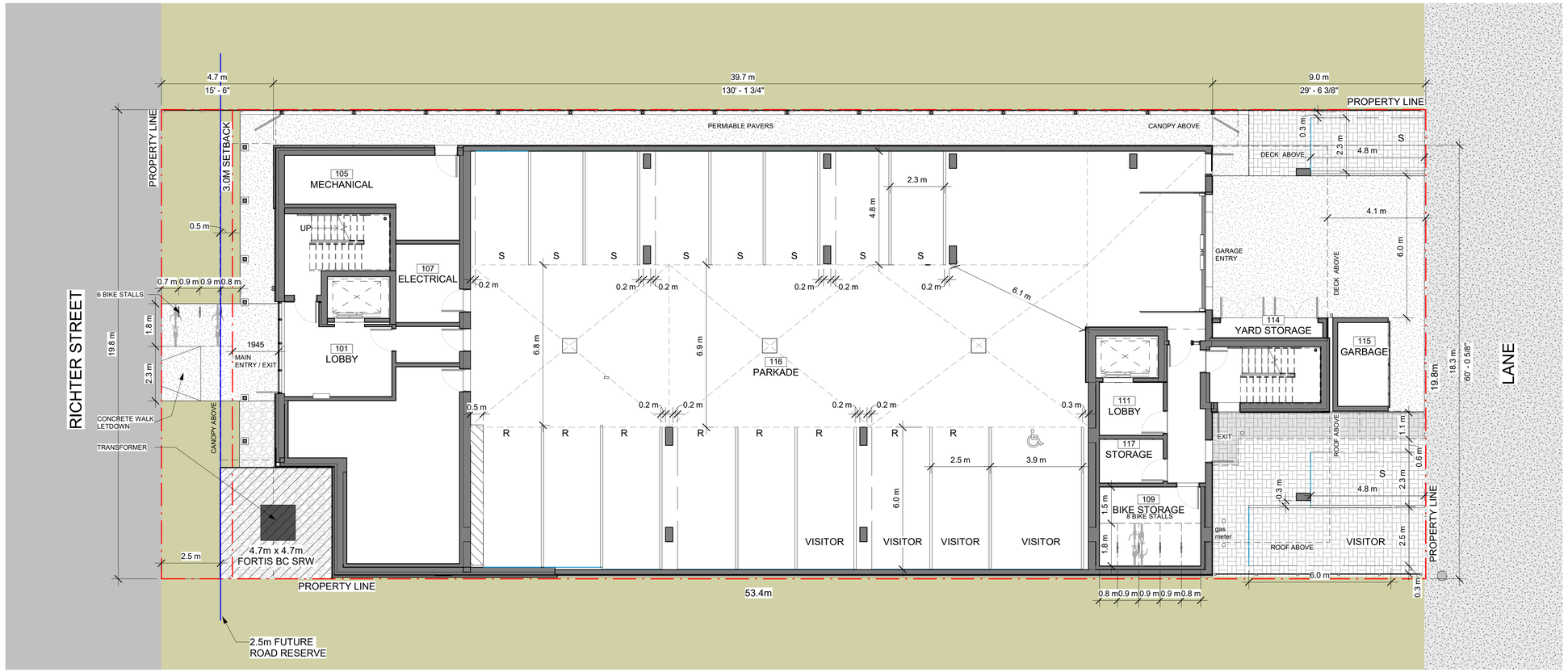
project title
NOW CANADA - WOMEN'S SHELTER
project address
2609 RICHTER STREET

project legal description
LOT 2 DISTRICT LOT 135 PLAN KAP3929

project no. 4165
file no. C:\Users\Jamie\Documents\4165 NOW WS - Central_Jamie2INLP.rvt

drawing title
ZONING & BYLAW

designed Designer | scale 1 : 10
drawn Author
checked Checker
drawing no. **A0.02D**
plotted 3/10/23 2:23:59 PM



1 / A0.04 LEVEL 1 / PARKADE
1/8" = 1'-0"

SCHEDULE A & B
This forms part of application
DP22-0236
Planner Initials AC
City of Kelowna
DEVELOPMENT PLANNING

ISSUED FOR PERMIT

NORTH

ALL CONTRACTORS ARE REQUIRED TO PERFORM THEIR WORK AND SUPPLY THEIR PRODUCTS IN COMPLIANCE WITH ALL BUILDING CODES AND LAWS OF THE PROVINCE OF BRITISH COLUMBIA

This drawing must not be scaled

Verify all dimensions and datums prior to commencement of work.

Report all errors and omissions to the Architect.

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LOT 2 DISTRICT LOT 135 PLAN KAP3929

project no. 4165
file no. C:\Users\Jenna\Documents\4165 NOW WS - Central_jenna2RBJF.rvt

drawing title
SITE PLAN

designed RM/JK
scale 1/8" = 1'-0"
drawn RM/JK
checked RM
drawing no. A1.01D
plotted 3/10/23 2:24:01 PM

1 Level 2
A0.04 1/8" = 1'-0"

2 Level 3
A0.04 1/8" = 1'-0"

NORTH

ALL CONTRACTORS ARE REQUIRED TO PERFORM THEIR WORK AND SUPPLY THEIR PRODUCTS IN COMPLIANCE WITH ALL BUILDING CODES AND LAWS OF THE PROVINCE OF BRITISH COLUMBIA

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REGISTERED ARCHITECT
STORMY VAMCHISHOY
BRITISH COLUMBIA

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project address
2609 RICHTER STREET

project legal description
LOT 2 DISTRICT LOT 135 PLAN KAP3929

project no. 4165
file no. C:\Users\Jenna\Documents\45 NOW WB - Central_jenna2RVT.rvt

drawing title
LEVELS 2 + 3 FLOOR PLANS

designed RM/JK
scale 1/8" = 1'-0"
drawn RM/JK
checked RM
drawing no. A3.01D
plotted 3/10/23 2:24:07 PM

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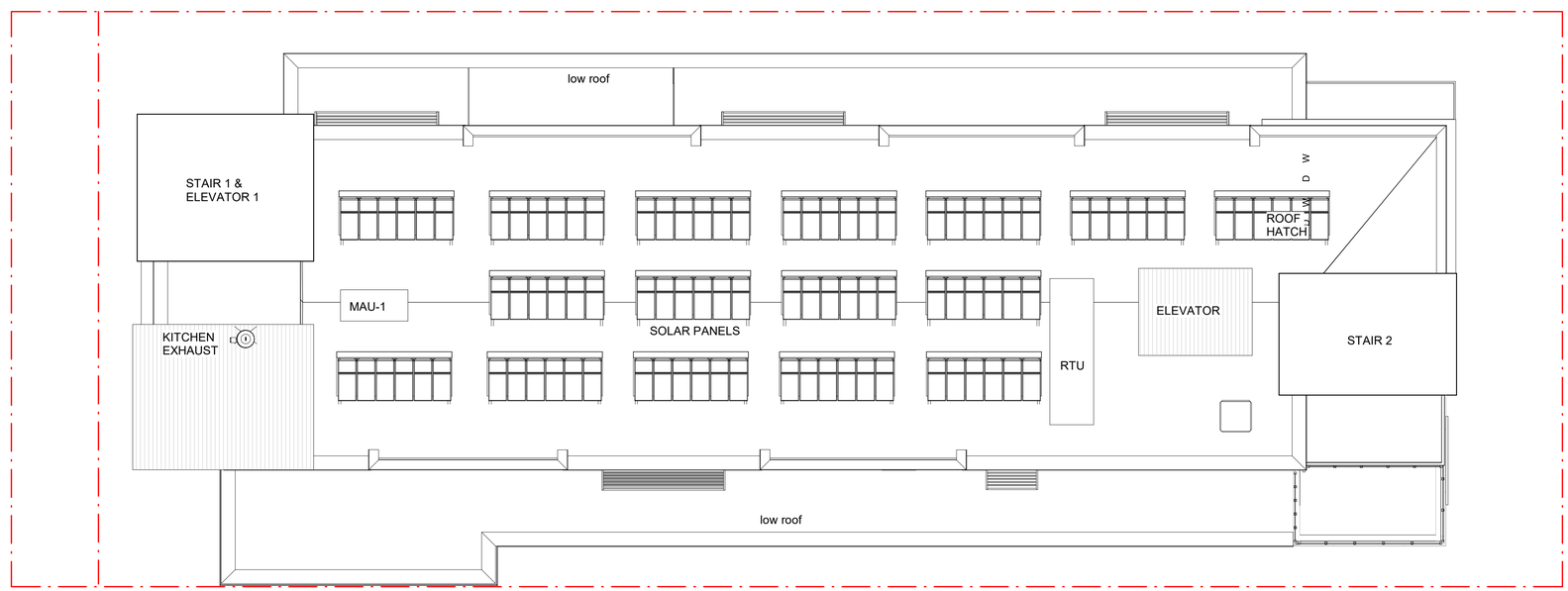
1/8" = 1'-0"



2 A0.04 ROOF PLAN
1/8" = 1'-0"

NORTH

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file no. C:\Users\Jenna\Documents\4165 NOW WS - Central_jenna2RBZP.rvt

drawing title
LEVELS 4, 5 + ROOF PLANS

designed RM/JK
scale 1/8" = 1'-0"
drawn RM/JK
checked RM
drawing no. A3.02D
plotted 3/10/23 2:24:12 PM

LUX ALUMINUM WOOD GRAIN VERTICAL **(#1)**

FIBER CEMENT PANEL - WHITE **(#2)**

FIBER CEMENT PANEL - GREY **(#3)**

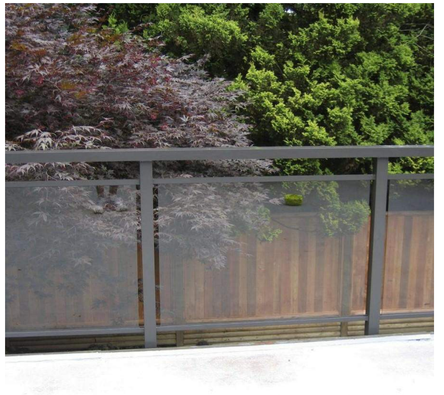
FIBER CEMENT PANEL - BLUE **(#4)**

FIBER CEMENT PANEL - BLACK **(#5)**

BRICK VENEER - GREY **(#6)**

CONCRETE WALL / COLUMN **(#8 & #9)**

GLASS RAILING **(#10)**



SCHEDULE A & B
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DP22-0236
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City of Kelowna
DEVELOPMENT PLANNING

ISSUED FOR PERMIT

NEW TOWN
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REGISTERED ARCHITECT
STEPHEN YAMCHISHYN
PROVINCE OF BRITISH COLUMBIA

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LOT 2 DISTRICT LOT 135 PLAN KAP3929

project no. 4165
file no. C:\Users\Jenna\Documents\4165 NOW WS - Central_jenna2f6LzP.rvt

drawing title
MATERIALS

designed Designer
scale 1 : 10
drawn Author
checked Checker
drawing no. A4.00D
plotted 3/10/23 2:24:12 PM

1 SOUTH ELEVATION
1/8" = 1'-0"

2 WEST ELEVATION
1/8" = 1'-0"

SCHEDULE A & B
This forms part of application
DP22-0236
Planner Initials AC
City of Kelowna DEVELOPMENT PLANNING

MATERIAL LEGEND

1. LUX ALUM. WOOD GRAIN VERTICAL,
2. FIBER CEMENT PANELS C/W EZY TRIM REVEALS - WHITE
3. FIBER CEMENT PANELS C/W EZY TRIM REVEALS - GREY
4. FIBER CEMENT PANELS - BLACK
5. BRICK VENEER - GREY
6. CONCRETE COLUMN
7. CONCRETE WALL
8. GLASS RAILING
9. OVERHEAD DOOR
10. GARBAGE ENCLOSURE
11. ALUMINUM GATE - BLACK
12. WALKWAY CANOPY
13. ALUMINUM SUNSHADE - BLACK
14. SOLAR PANEL

ISSUED FOR PERMIT

NEW TOWN
ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING
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Seal

REGISTERED ARCHITECT TOMMY TAMCHISHIN BRITISH COLUMBIA

Revisions

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project legal description
LOT 2 DISTRICT LOT 135 PLAN KAP3929

project no. 4165
file no. C:\Users\Jenna\Documents\4165 NOW WS - Central_jenna2RLP.rvt

drawing title
BUILDING ELEVATIONS

designed RM/JK
scale As indicated
drawn RM/JK
checked RM
drawing no. A4.01D
plotted 3/10/23 2:24:18 PM

2 NORTH ELEVATION
1/8" = 1'-0"

1 EAST ELEVATION
1/8" = 1'-0"

MATERIAL LEGEND

1. LUX ALUM. WOOD GRAIN VERTICAL,
2. FIBER CEMENT PANELS C/W EZY TRIM REVEALS - WHITE
3. FIBER CEMENT PANELS C/W EZY TRIM REVEALS - GREY
4. FIBER CEMENT PANELS - BLACK
5. BRICK VENEER - GREY
6. CONCRETE COLUMN
7. CONCRETE WALL
8. GLASS RAILING
9. OVERHEAD DOOR
10. GARBAGE ENCLOSURE
11. ALUMINUM GATE - BLACK
12. WALKWAY CANOPY
13. ALUMINUM SUNSHADE - BLACK
14. SOLAR PANEL

SCHEDULE A & B
This forms part of application
DP22-0236
City of Kelowna
DEVELOPMENT PLANNING
Planner Initials AC

ISSUED FOR PERMIT

NEW TOWN
ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING
www.newtownservices.ca

Seal

Revisions

No.	DATE	DESCRIPTION
4	2023-03-10	RE-ISSUED FOR DP

project title
NOW CANADA - WOMEN'S SHELTER

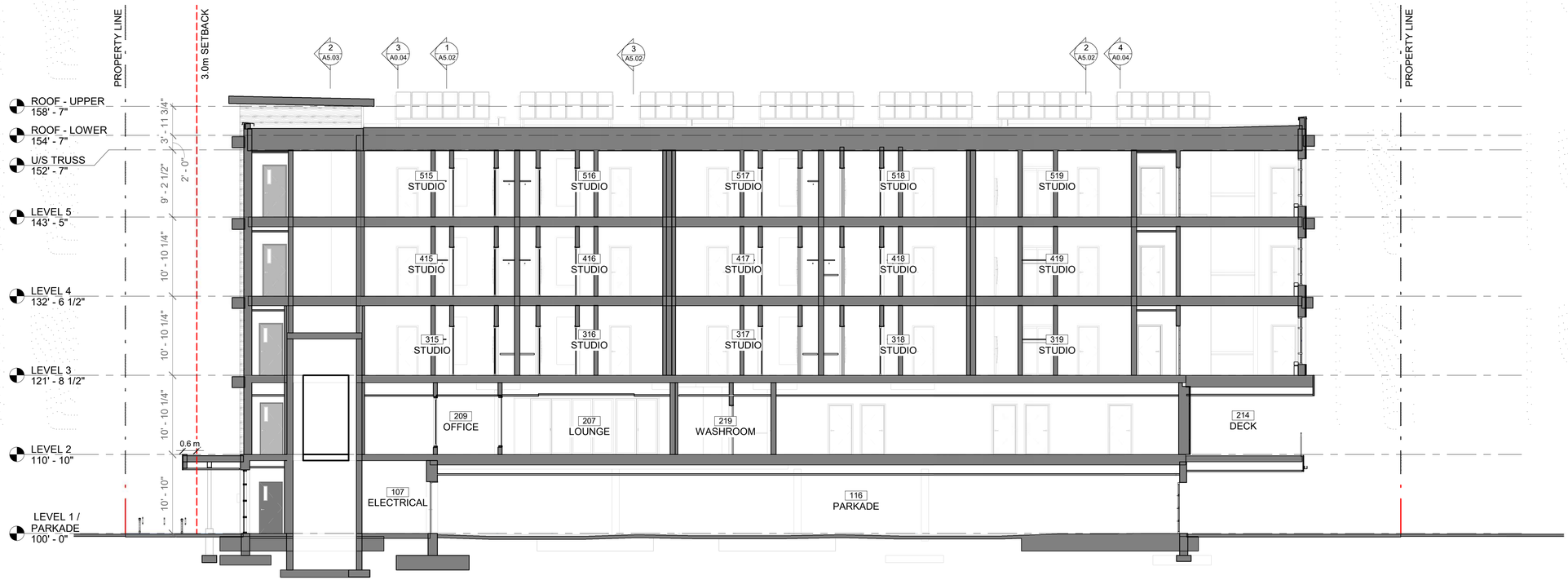
project address
2609 RICHTER STREET

project legal description
LOT 2 DISTRICT LOT 135 PLAN KAP3929

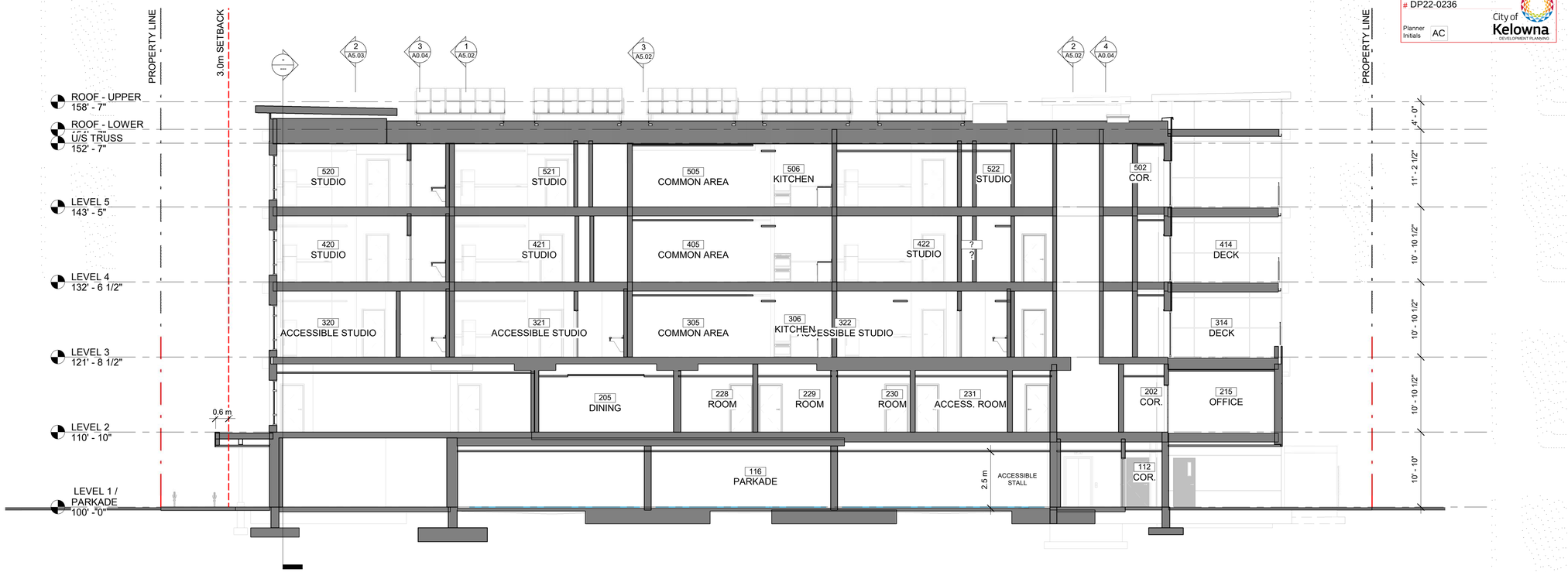
project no. 4165
file no. C:\Users\Jenna\Documents\4165 NOW WS - Central_jenna2RBJP.rvt

drawing title
BUILDING ELEVATIONS

designed RM/JK | scale As indicated
drawn RM/JK
checked RM
drawing no. A4.02D
plotted 3/10/23 2:24:23 PM



1 Section 2
1/8" = 1'-0"



2 Section 3
1/8" = 1'-0"

SCHEDULE A & B
This forms part of application
DP22-0236
Planner Initials AC
City of Kelowna
DEVELOPMENT PLANNING

NEW TOWN
ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING
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Seal

REGISTERED ARCHITECT
STOMAN YAMCHISHYN
BRITISH COLUMBIA

Revisions

No.	DATE	DESCRIPTION
4	2023-03-10	RE-ISSUED FOR DP

project title
NOW CANADA - WOMEN'S SHELTER
project address
2609 RICHTER STREET

project legal description
LOT 2 DISTRICT LOT 135 PLAN KAP3929

project no. 4165
file no. C:\Users\Jenna\Documents\ARS NOW WS - Central_Jenna2RLP.rvt

drawing title
BUILDING SECTIONS

designed RM/JK
scale 1/8" = 1'-0"
drawn RM/JK
checked RM
drawing no. A5.01D
plotted 3/10/23 2:24:27 PM

VIEW LOOKING NORTH EAST - FRONT ELEVATION

VIEW LOOKING SOUTH EAST - FRONT ELEVATION

VIEW LOOKING NORTH WEST - REAR ELEVATION

VIEW LOOKING SOUTH WEST - REAR ELEVATION

SCHEDULE A & B

This forms part of application
DP22-0236

Planner Initials AC

City of Kelowna
DEVELOPMENT PLANNING

ISSUED FOR PERMIT

NEW TOWN
ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING
www.newtownservices.ca

Seal

REGISTERED ARCHITECT
STEPHEN YAMCHISHYN
PROFESSIONAL ENGINEER
BRITISH COLUMBIA

Revisions

No.	DATE	DESCRIPTION
4	2023-03-10	RE-ISSUED FOR DP

project title
NOW CANADA - WOMEN'S SHELTER

project address
2609 RICHTER STREET

project legal description
LOT 2 DISTRICT LOT 135 PLAN KAP3929

project no. 4165
file no. C:\Users\Jenna\Documents\4165 NOW WS - Central_jenna2RVT.rvt

drawing title
RENDERINGS

designed Designer | scale 1 : 10
drawn Author
checked Checker
drawing no. A9.01D
plotted 3/10/23 2:24:28 PM

MK DESIGN GROUP

Date: 27-Mar-23
Project No: C22-11
Project Address: 2609 Richter St, Kelowna BC
Municipal Project No:

PROPOSED LANDSCAPE COSTS

SOFTSCAPE *Supply & install with 1 year warranty*		Size	Unit	Qty	Unit Cost	Total Cost
1.0	Deciduous Tree	5cm cal.	each	1	$500.00	$500.00
1.1	Deciduous Tree	4cm cal.	each	1	$400.00	$400.00
1.2	Shrubs (min 40cm ht)	#2 cont.	each	10	$22.00	$220.00
1.3	Shrubs (min 150cm ht)	#5 cont.	each	15	$72.00	$1,080.00
1.4	Perennials/Grasses/Ground Cover	#1 cont.	each	65	$12.50	$812.50
1.5	Sod + 150mm growing medium	area	m2	11.4	$18.00	$205.20
1.6	Growing Medium	volume	m3	50.60	$30.00	$1,518.00
1.7	Root Barrier	length	lm	14.55	$32.00	$465.60
					Softscape Total	**$5,201.30**

HARDSCAPE		Size	Unit	Qty	Unit Cost	Total Cost
2.0	Stamped Concrete	area	m2	19.20	$125.00	$2,400.00
2.1	Concrete	area	m2	63.1	$80.00	$5,048.00
2.2	River Rock 50-100mm dia. 200mm depth	area	m2	23.8	$100.00	$2,380.00
2.3	Boulders 0.8-1.2m dia.		each	4	$150.00	$600.00
					Hardscape Total	**$10,428.00**

SITE FURNISHING		Size	Unit	Qty	Unit Cost	Total Cost
3.0	Bike Racks		each	3	$450.00	$1,350.00
					Site Furnishing Total	**$1,350.00**

FENCING		Size	Unit	Qty	Unit Cost	Total Cost
4.0	Vinyl Fence 1.8m ht	length	lm	53.3	$100.00	$5,330.00
					Fencing Total	**$5,330.00**

Subtotal	$22,309.30
Contingency 15%	$3,346.40
PROPOSED LANDSCAPE TOTAL	**$25,655.70**
	plus applicable taxes

Date: March 28, 2023

Landscape Architect Name: Jessica Thiessen

Landscape Architect Signature:

SCHEDULE C
This forms part of application
DP22-0236
Planner Initials AC
City of Kelowna DEVELOPMENT PLANNING

MK DESIGN GROUP

NOW CANADA - RICHTER ST

ISSUED FOR DEVELOPMENT PERMIT

CONTACT INFORMATION:

Primary Contact:

MK Design Group
Milana Malesevich
p. 778-955-8995
e. milana.mkdesigngroup@gmail.com

OTHER KEY CONTACTS

NOW Canada
Project Owner

Liz Talbot
p. 250-763-3876
e. liz@nowcanada.ca
2970 Tutt St
Kelowna, BC
V1Y 8Z5

Bentsen Homes Inc
Project Developer

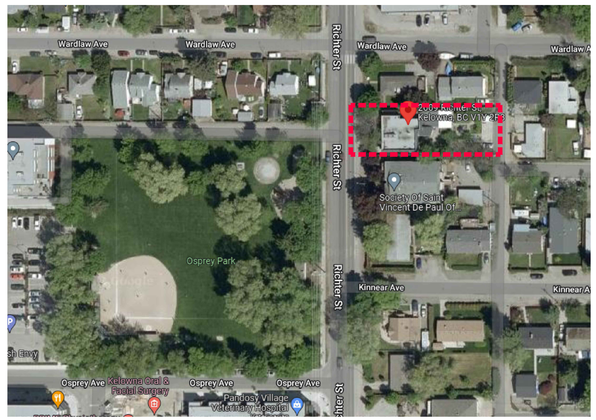
Kane Bentsen
p. 250-212-9128
e. kane@bentsenhomes.com
1769 Broadview Ave
Kelowna, BC
V1Y 4G3

Newtown Services
Architect

Jesse Alexander
p. 250-258-9651
e. jesse@newtownservices.net
1464 St. Paul St
Kelowna, BC
V1Y 2E6

Site Plan Overview - 1:100

Key Plan - NTS



Sheet List Table	
Sheet Number	**Sheet Title**
L-00	COVER SHEET
L-01	LANDSCAPE PLAN
LD-01	LANDSCAPE DETAILS
LN-01	LANDSCAPE NOTES

SCHEDULE C
This forms part of application
DP22-0236
Planner Initials AC
City of Kelowna
DEVELOPMENT PLANNING

1:100 0 1m 2 3 4 5 6 7 8 9 10 11

Project:
NOW CANADA - RICHTER ST

Location:
2609 RICHTER ST
KELOWNA, BC
V1Y 2R3

Drawn: **MM**
Approved: **JT**
Scale: **AS SHOWN**

Key Plan:

No.	By	Description	Date: DD/MM/YY
4	MM	Re-Issued for DP	27/03/2023
3	MM	Re-Issued for DP	28/02/2023
2	MM	Issued for Development Permit	02/12/2022
1	MM	Issued for Review	29/11/2022

REVISIONS TABLE FOR DRAWINGS

BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS REGISTERED MEMBER JESSICA THIESSEN 679
2023-03-28

PROFESSIONAL STAMP/SEAL

MK DESIGN GROUP

Drawing Title:
COVER SHEET

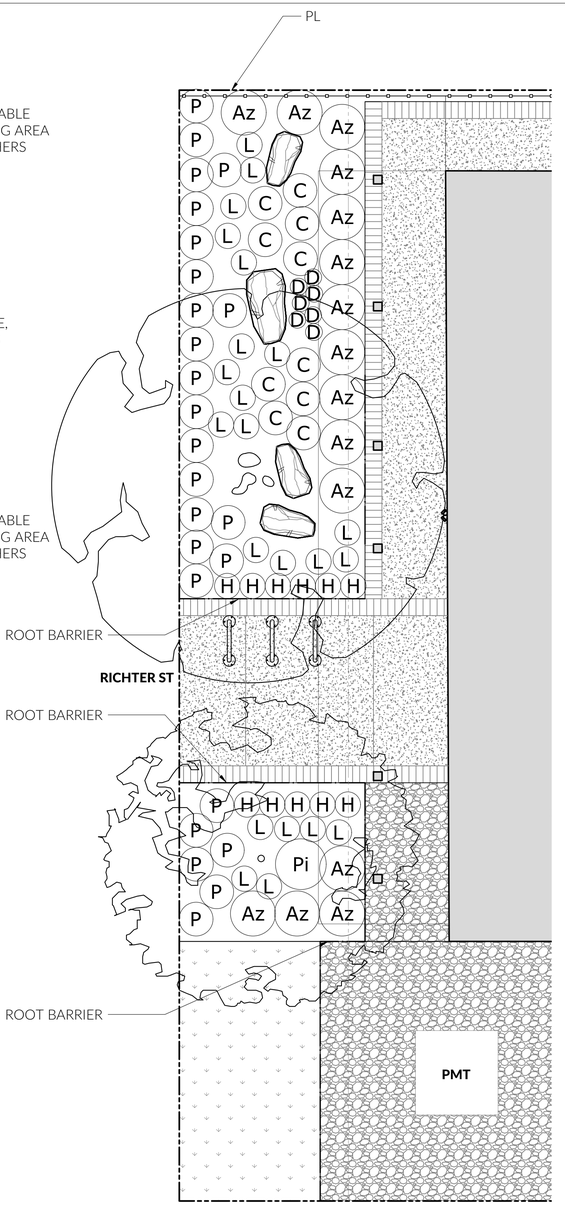
Project #:
CD-22-11

Drawing #:
L-00

MK DESIGN GROUP

1 **SITE PLAN**
Scale 1:100

1:100 0 1m 2 3 4 5 6 7 8 9 10 11



2 **PLANTING PLAN**
Scale 1:50

1:50 0 0.5m 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5

SCHEDULE C
This forms part of application
DP22-0236
City of Kelowna
DEVELOPMENT PLANNING
Planner Initials AC

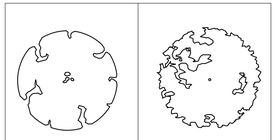
LANDSCAPE LEGEND

KEY	REF.	DESCRIPTION
	1 & 2 LD-01	SHRUBS & PERENNIALS
	1 & 2 LD-01	GROUNDCOVER
	5 LD-01	CIP CONCRETE Inlay: Natural light sand blast Border: Stamped Running Bond Pattern, tinted 'Dusk' as per Lafarge Artevia Concrete, or approved equal
	4 LD-01	200mm DEPTH OF ¾" - 1.5" RIVER STONE WITH ROMEX ROMPOX PROFI-DECKO *Install as per manufacturer's instructions* *Romex Contact: Joe Steinback 778-903-5602*
		400mm DEEP ROOT BARRIER ALONG HARDSCAPE & TIMBER EDGE ADJACENT TO PROPOSED TREE AS INDICATED *Install as per manufacturer's instructions*
	1 LD-01	NVP 1.8m (6 FT) PRIVACY FENCE Posts: Clay Rails: Clay Infill: Driftwood *Install as per manufacturer's instructions*
	6 LD-01	ARMOUR STONE - VARIOUS SIZES MIN SIZE 500mm X 500mm MAX 350mm ABOVE GRADE
		SOD LEVEL 1 'WELL GROOMED' AS PER THE CANADIAN LANDSCAPE STANDARD
	8 LD-01	BIKE RACK Colour: Galvanized Mounting: Surface Mount Spacing: 762mm (30") O.C.

LANDSCAPE FRONTAGE CALC.

As per Bylaw 12375		
Project Frontage Area (m2)	Frontage Soil Area (m2)	% of Soil within Frontage
59.40	47.02	79.16

TREE LEGEND



Cercidiphyllum japonicum	Parrotia persica

PLANT SCHEDULE

KEY	QUANTITY	BOTANICAL NAME	COMMON NAME	CONTAINER SIZE	SPACING
SHRUBS					
Az	15	Azalea 'Hino Krimsin'	Azalea Red Flowered	#5 Pot	800mm O.C.
PERENNIALS/GRASSES					
C	10	Calamagrostis brachytricha	Korean Feather Reed Grass	#2 Pot	600mm O.C.
D	7	Digitalis purpurea 'Camelot Cream'	Cream Camelot Foxglove	#1 Pot	300mm O.C.
H	11	Heuchera 'Caramel'	Caramel Coral Bells	#1 Pot	450mm O.C.
L	22	Lavendula angustifolia 'Hidcote Superior'	Hidcote Lavender	#1 Pot	450mm O.C.
P	25	Phlox subulata 'Candy Stripe'	Candy Stripe Phlox	#1 Pot	600mm O.C.

TREE CALCULATION

As per Bylaw 12375 Table 7.2				
Project Landscape Area (m2)	Project Linear Frontage (M)	Tree Calculation: Project Landscape Area / 30m2 = 1 Tree	Tree Calculation: Project Landscape Linear Frontage / 10 lin M = 1 Tree	Total Tree Quantity
50.600000	15	1.7	1.5	2

TREE & SHRUB SCHEDULE

TREES							
QUAN.	KEY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	KELOWNA TREE CLASS.	ACCESSIBLE SOIL QTY.
1	see legend	Cercidiphyllum japonicum	Katsura Tree	B+B; 5cm caliper; 1.8m standard	As shown	Large Tree	30.0m3
1	see legend	Parrotia persica	Persian Ironwood	B+B; 4cm caliper; 1.8m standard	As shown	Medium Tree	20.6m3

Project:
NOW CANADA - RICHTER ST

Location:
2609 RICHTER ST
KELOWNA, BC
V1Y 2R3

Drawn: **MM**
Approved: **JT**
Scale: **AS SHOWN**

Key Plan:

No.	By	Description	Date: DD/MM/YY
4	MM	Re-Issued for DP	27/03/2023
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1	MM	Issued for Review	29/11/2022

REVISIONS TABLE FOR DRAWINGS

BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS REGISTERED MEMBER JESSICA THIESSEN 670
2023-04-04

PROFESSIONAL STAMP/SEAL

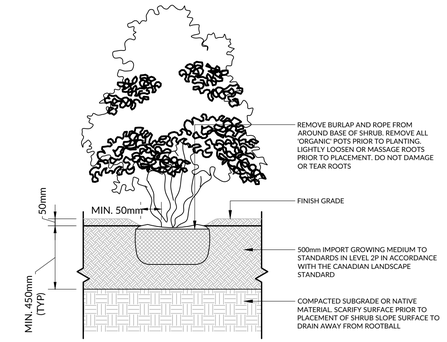
MK DESIGN GROUP

Drawing Title:
LANDSCAPE PLAN

Project #: **CD-22-11**

Drawing #: **L-01**

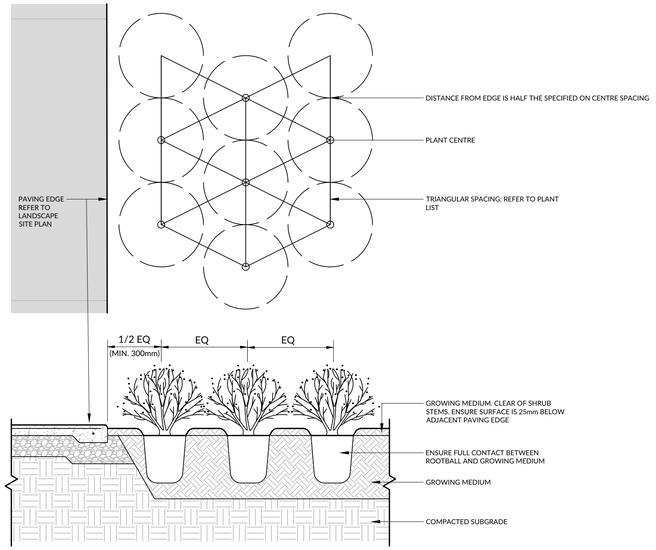
MK DESIGN GROUP



NOTES:

1. SHRUB TO BE PLANTED LEVEL WITH FINISH GRADE
2. COMPOSTED BARK MULCH OMITTED AS A RESULT CPTED CONCERNS DUE TO THE NATURE OF THE FINAL OCCUPANCY OF THIS BUILDING, IN LIEU OF MULCH, ADDITIONAL 50mm TOP UP OF GROWING MATERIAL TO BE PLACED. ALL PLANTING AREAS TO BE IRRIGATED
3. CONTRACTOR TO NOTIFY CONSULTANT AND CITY REPRESENTATIVE OF POORLY DRAINING SOILS PRIOR TO PLANTING.
4. DISTURBED SUBGRADE, NATIVE MATERIAL, OR IMPORT FILL TO BE SUITABLY COMPACTED IN ACCORDANCE WITH CANADIAN LANDSCAPE STANDARDS TO PREVENT SETTLEMENT OF ROOTBALL
5. PRUNING SHALL BE LIMITED TO THE MINIMUM NECESSARY TO REMOVE DEAD, DISEASED, DAMAGED, OR DEFECTIVE BRANCHES IN ACCORDANCE WITH THE CANADIAN LANDSCAPE STANDARD

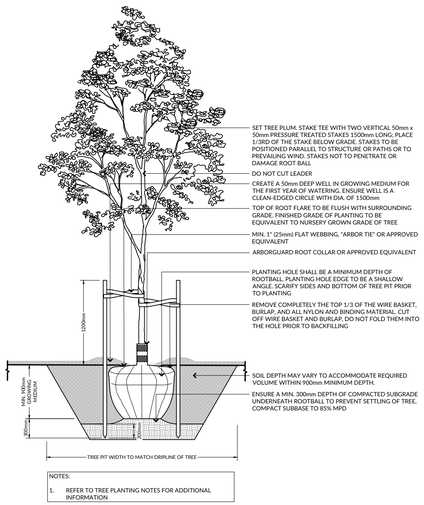
1 SHRUB PLANTING
Scale 1:20



NOTES:

1. REFER TO CANADIAN LANDSCAPE STANDARD FOR COMPACTION AND PREPARATION REQUIREMENTS FOR PLANTING BEDS
2. REFER TO SHRUB PLANTING DETAILS FOR INFORMATION ON GROWING MEDIUM AND MULCH NOTES
3. ENSURE MATURE SHRUB FORM WILL NOT OVERHANG WALKWAY
4. ADJACENT PAVING BASE COURSE TO EXTEND 150mm INTO PLANTING BED

2 VEGETATION SPACING
Scale 1:20

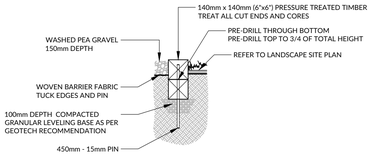


NOTES:

1. REFER TO TREE PLANTING NOTES FOR ADDITIONAL INFORMATION

3 TREE PLANTING ON GRADE
Scale 1:25

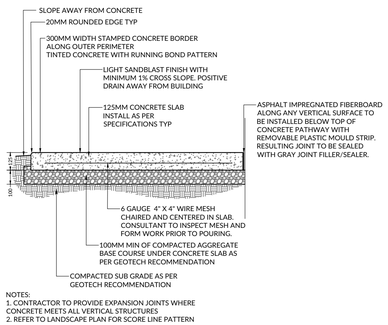
SCHEDULE C
This forms part of application
DP22-0236
Planner Initials AC
City of Kelowna DEVELOPMENT PLANNING



NOTES:

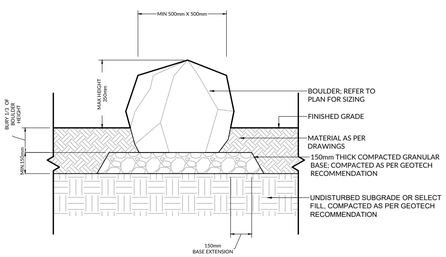
1. APPLY ROMEX ROMPOM PROFI-DEKO TO AGGREGATE AS PER MANUFACTURER'S INSTRUCTIONS TO PREVENT AGGREGATE MIGRATION
   Romex Contact: Joe Steinback 778-903-5602

4 DRIP STRIP DETAIL
Scale 1:20



NOTES:
1. CONTRACTOR TO PROVIDE EXPANSION JOINTS WHERE CONCRETE MEETS ALL VERTICAL STRUCTURES
2. REFER TO LANDSCAPE PLAN FOR SCORE LINE PATTERN

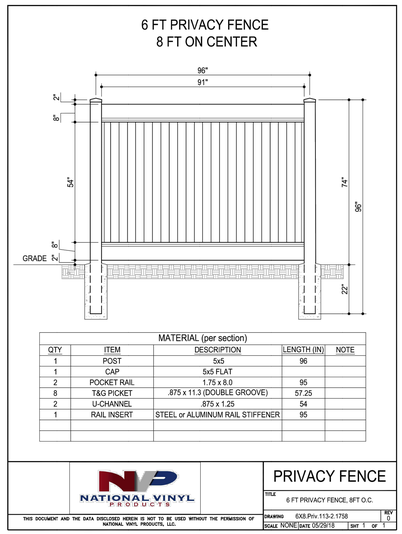
5 CONCRETE PATHWAY
1:20



NOTES:

1. NO CRACKED OR BROKEN EDGES, SHARP CORNERS, OR PROJECTIONS SHALL BE EXPOSED ABOVE FINISHED GRADE (SMOOTH EDGES ONLY)
2. ENSURE BOULDERS ARE BURIED MINIMUM 1/3 DEEP IN AREAS OF TRANSITION OR TOPOGRAPHICAL CHANGE

6 LANDSCAPE BOULDER
1:20



MATERIAL (per section)				
QTY	ITEM	DESCRIPTION	LENGTH (IN)	NOTE
1	POST	5x5	96	
1	CAP	5x5 FLAT		
2	POCKET RAIL	1.75 x 8.0	95	
8	T&G PICKET	.875 x 11.3 (DOUBLE GROOVE)	57.25	
2	U-CHANNEL	.875 x 1.25	54	
1	RAIL INSERT	STEEL or ALUMINUM RAIL STIFFENER	95	

NATIONAL VINYL PRODUCTS

PRIVACY FENCE

TITLE: 6 FT PRIVACY FENCE, 8FT O.C.

DRAWING: 6X8 Priv 113-2-1758 | REV: 0

SCALE: NONE | DATE: 05/29/18 | SHT 1 OF 1

THIS DOCUMENT AND THE DATA DISCLOSED HEREIN IS NOT TO BE USED WITHOUT THE PERMISSION OF NATIONAL VINYL PRODUCTS, LLC.

COLOURS:
Post: Clay
Rail: Clay
Infill: Driftwood

Install as per Manufacturer's Instructions

7 1.8M PRIVACY FENCE
NTS

MANUFACTURER: ULINE
MODEL: H-6572GALV
COLOUR: GALVANIZED
ANCHOR: SURFACE MOUNT
QTY: 3
NOTES:
Install as per manufacturers instructions. All hardware to be tamperproof.

8 BIKE RACK
NTS

Project:
NOW CANADA - RICHTER ST

Location:
2609 RICHTER ST
KELOWNA, BC
V1Y 2R3

Drawn: **MM**
Approved: **JT**
Scale: AS SHOWN

Key Plan:

No.	By	Description	Date: DD/MM/YY
4	MM	Re-Issued for DP	27/03/2023
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REVISIONS TABLE FOR DRAWINGS

BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS REGISTERED MEMBER JESSICA THIESSEN 679
2023-03-28

PROFESSIONAL STAMP/SEAL

MK DESIGN GROUP

Drawing Title:
LANDSCAPE DETAILS

Project #: **CD-22-11**

Drawing #: **LD-01**

MK DESIGN GROUP

CRITICAL LANDSCAPE NOTES:

PROJECT CONTACT:
1.1 Inquiries regarding landscape drawings should be addressed to:

PRIMARY CONTACT:
Milana Malesevich, Principal
P. 778-955-8995
milana@mk-designgroup.com

PROJECT COORDINATION:
2.1 The contractor(s) responsible for completing the landscape scope of work shall conform to the reference standards, submittals process, coordination standards, specifications, and works as defined under the “Division 1 General Requirements” of the master specification (complete).

DRAWINGS AND SPECIFICATIONS:
3.1 The contractor, sub-contractor, and coordinating trades/suppliers responsible for completing the landscape scope of work is responsible for reviewing the master specification package for the project in conjunction with all consultant drawings, inclusive of landscape.

3.2 Should any drawing or detail conflict with the master specification file the contractor must immediately notify the design team for coordination prior to order, preparation or installation of said conflicting works (typ).

3.3 Examples of key specifications that relate to landscape are inclusive of:

- Division 1, General Requirements
- Division 2, Existing Conditions
- Division 3, Concrete
- Division 4, Masonry
- Division 5, Metals
- Division 6, Wood and plastics
- Division 7, Thermal and Moisture Protection
- Division 9, Painting and Coating
- Division 31, Earthwork
- Division 32, Exterior Improvements

3.4 The contractor(s) responsible for completing hard and soft landscape works are responsible for providing the landscape architect with a complete “project record copy” of mark-ups or changes to works defined in the Landscape Drawings. This is in addition to any record drawing requests defined under Division 1. The project record copy mark-ups should be completed with red pen if submitted as a hard copy or in red coloured notes if submitted as a PDF.

LANDSCAPE CONCRETE WORK:
4.1 All concrete shall conform to all standards identified under Division 3 of the master specification and specifications by the Civil Engineer (refer to civil drawings, with references to MMCD specs) (complete)

4.2 Concrete reinforcing for vertical landscape cast in place walls shall comply with details and specifications defined in structural drawing.

4.3 All horizontal exterior concrete surfaces shall have a light broom finish or approved equal unless specified otherwise

4.4 All vertical concrete surfaces inclusive of cast in place walls shall have a light sand blast finish or approved equal unless specified otherwise

4.5 The contractor should confirm the locations of control joint patterning and expansion joints with the landscape architect prior to installation for concrete paving surfaces and walls

UNIT PAVING:
5.1 Precast concrete unit pavers or natural stone unit pavers must be provided in a 2m x 2m 'mock-up' on site a minimum 2 weeks prior to order of materials for approval by the landscape architect. The mock-up should be installed as per manufacturer's specifications and include any bedding material, pedestals, grouts or mortar specified in project drawings or specifications. Grouts, mortars, sealers, or products that require drying time must have been installed a minimum 3 business days prior to the time of review by the landscape architect.

5.2 All approved unit paving and bedding or joining materials should be installed as per manufacturers specifications

5.3 Professionals should be qualified and experienced (minimum 5 years) in installing paving products specified in landscape drawings

METALS:
6.1 All metal work shall conform to Division 4 of the master specification for the project (complete)

6.2 Additional references that apply to metal work (may not necessarily be included under Division 4):

- .1 American Society for Testing and Materials International, (ASTM).
- .1 ASTM A53/A53M_[02], Specification for Pipe, Steel, Black and Hot_Dipped, Zinc_Coated, Welded and Seamless.
- .2 ASTM A121_[99], Specification for Zinc_Coated (Galvanized) Steel Barbed Wire.
- .3 ASTM D5116_[97], Standard Guide For Small_Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- .2 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB_1.28_[98], Alkyd, Exterior House Paint.
- .2 CAN/CGSB_1.69_[98], Aluminum Paint.
- .3 CAN/CGSB_1.181_[99], Ready_Mixed Organic Zinc_Rich Coating.
- .4 CAN/CGSB_1_GP_138M_[97], Paint Exterior Latex Type Flat.
- .3 Canadian Standards Association (CSA International).
- .1 CAN/CSA-A23.1-[00]/A23.2-[F00], Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
- .2 CSA G42_[1964(R1998)], Galvanized (Zinc_Coated) Steel Farm_Field Wire Fencing.
- .3 CSA_O80 Series_[97], Wood Preservation.
- .4 Environmental Choice Program (ECP).
- .1 CCD-047a-[98], Paints, Surface Coatings.
- .2 CCD-47b-[98], Stains, Surface Coatings.
- .3 CCD-47c-[98], Varnishes, Surface Coatings.
- .4 CCD-048-[95], Surface Coatings -Recycled Water-Borne.

6.3 All metal work shall be treated for protection from corrosion (i.e. Aluminum must be anodized and steel must be galvanized or stainless steel) prior to additional coatings of paints or sealers. This is inclusive of fasteners.

6.4 All metal bonding (i.e. welding or soldering) must be completed and metal work should be treated for protection from corrosion. Bonding work should be concealed by the finishes of the metal work. Sanding or handwork needed to provide a smooth and consistent finish along the bonded metal material should be done to match the finish of the metals used for joining

6.5 Install a grounding rod on all fences, metal posts or poles taller than 6' (1800mm) in height through the direction of the project electrical engineer. Contractor to confirm the location(s) of said work at the time of project start-up with the electrical engineer and landscape architect

FENCING & GUARDRAILS:
7.1 All fences, fasteners and railings shall be submitted via shop drawing and submitted for approval by the landscape architect prior to purchase or installation

7.2 All fasteners used in wood connections (i.e. screws, nails, etc) are to be countersunk and predrilled to prevent wood splitting unless specified otherwise

7.3 All anchor plates, hangers, and affiliated fastener joining materials must meet flush between joining surfaces without gaps, unless specified otherwise

7.4 All railing heights, picket spacing, and rail spacing should be in accordance with the British Columbia Building Code, CAN/CSA - Z614-07 and affiliated ASTM standards

IRRIGATION:
8.1 Irrigation work should be completed to comply with the Canadian Electrical Code and Canadian Plumbing Code

8.2 Irrigation work should be completed by and installer with over 5 years experience in irrigation work

8.3 Refer to irrigation drawings for additional specifications

PLANTING AND SOFTSCAPES:

9.1 All landscape materials, planting and softscaping shall conform to standards defined under Division 32 and Canadian Landscape Standards, latest edition.

9.2 The contractor is responsible to have the landscape architect inspect the site for fine grading in areas where slopes, berms or mounds are used as part of soft landscaping features prior to the installation of plant material. A minimum 7 days notice is required for this review.

9.3 The contractor is responsible to have the landscape architect inspect the site for fine grading in areas where sod or seed are used as part of soft landscaping features prior to the installation of sod or seed. A minimum 7 business days notice is required for this review. Preparation of sod and seed areas shall conform to Canadian Landscape Standards. No 1 Turfgrass, and No. 1 Canadian seed standards apply as defined through Canadian landscape standards. Installation and maintenance specifications of sod and seed shall apply as defined through Canadian Landscape Standards.

9.4 Sodded areas as shown on the planting plan are to be certified Canada No. 1 Cultivated Turf Sod, with strong fibrous root system, thick and heavy growth conforming to requirements of the Canadian Landscape Standard latest edition 'Level 1, well groomed'.

9.5 Areas to be sodded shall have a minimum of 150mm topsoil base.

9.6 Deliver sod to site within 24 hours of being lifted and lay within 36 hours of being lifted. During dry weather, protect sod from drying and water as necessary to prevent the loss of soil in handling. Dry sod is subject to rejection as per the project Landscape Architect.

9.7 Lay sod during growing season. Lay sod in rows, perpendicular to slope and with joints staggered. Butt sections closely without overlapping gaps. Gaps between sod strips and small sod strips to fill gaps are subject to rejection as per the project Landscape Architect and require rolling new sod.

9.8 Water sod immediately after laying to obtain moisture penetration into top 150mm of topsoil. Maintain sodded areas from start of installation until final acceptance.

9.9 Establishment maintenance must be completed by the landscape contractor through the course of construction/installation, substantial completion and until the time of final acceptance once all deficiencies are deemed as complete. Establishment maintenance practice and procedures are defined under the BC Landscape Standard, latest edition. This should be compliant with “Level 1, well groomed landscapes”.

9.10 Establishment watering must be completed by the landscape contractor through the course of construction/installation, substantial completion and until the time of final acceptance once all deficiencies are deemed as complete. Establishment watering practice and procedures are defined under the BC Landscape Standard, latest edition. This should be compliant with “Level 1, well groomed landscapes”.

9.11 The landscape contractor should provide the landscape architect with one week's notice to perform a review at local nurseries who are supplying major plant orders to the site. The landscape architect reserves the right to reject plant material that does not meet drawing specification or BC Landscape Standards at any time, despite any review of said materials.

9.12 The landscape contractor must submit a soil report/test report to that shows that growing mediums comply with the standards identified in the BC Landscape Standard, latest edition for “Level 1, well groomed landscapes”

9.13 The general contractor shall pay for a minimum two (2) random tests will be performed during the course of construction to confirm that the growing medium being installed on site matches the test approved by the landscape architect. The landscape architect will notify the general contractor of when said tests will occur and soil samples should be mailed out within 48 hours of this notice. Failure to have soil match approved material could result in removal, amendment or reinstallation of appropriate material at the contractor's expense. Soil tests should be sent to Pacific Soil Analysis Incorporated or approved equal testing center.
Pacific Soil Analysis Inc.
Suite 5-11720 Voyageur Way, RICHMOND, BC V6X 3G9
Telephone 604 273 8226

9.14 Due to the nature of this project, Landscape mulch will not be used based on Fire Risk and CPTED safety principles. Additional growing material shall be used in lieu of Mulch.

9.15 In areas where soft landscaping shall be planted over structural slabs, the contractor must submit, in writing, that the project architect has inspected planters or areas of soft landscape planting and has approved the waterproofing and slab protection present, such that it conforms to contract specifications and drawings. This shall be done prior to any inspections the landscape architect shall make to review growing medium depths or plant installation.

9.16 Should any fertilizers or chemicals be applied to soft landscapes, they must be non-toxic.

9.17 It is expected that the contractor shall recycle waste materials and packaging in accordance with Waste Management and Disposal procedures defined under Division 1 of the master specification

SCHEDULE C
This forms part of application
DP22-0236
City of Kelowna
DEVELOPMENT PLANNING
Planner Initials AC

Project:
NOW CANADA - RICHTER ST

Location:
2609 RICHTER ST
KELOWNA, BC
V1Y 2R3

Drawn: **MM**
Approved: **JT**
Scale:

Key Plan:

No.	By	Description	Date: DD/MM/YY
4	MM	Re-Issued for DP	27/03/2023
3	MM	Re-Issued for DP	28/02/2023
2	MM	Issued for Development Permit	02/12/2022
1	MM	Issued for Review	29/11/2022

REVISIONS TABLE FOR DRAWINGS

BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS REGISTERED MEMBER JESSICA THIESSEN 679
2023-03-28

PROFESSIONAL STAMP/SEAL

MK DESIGN GROUP

Drawing Title:
LANDSCAPE NOTES

Project #:
CD-22-11

Drawing #:
LN-01

1 IRRIGATION PLAN
IR1.0 / 1:150

NORTH

SCHEDULE C
This forms part of application
DP22-0236
City of Kelowna
DEVELOPMENT PLANNING
Planner Initials AC

IRRIGATION LEGEND

RAIN BIRD XQF-75-18 HEADER	13m	RAIN BIRD XFSCV0912 SUBSURFACE DRIPLINE w/ 0.9gph EMITTERS SPACED @ 300mm, LATERALS SPACED @ 450mm, 100mm DEPTH	78m
25mm CLASS 200 PVC LATERAL	38m	1 DRIPLINE LAYOUT IR2.0 RAIN BIRD XFSCV0912	
25mm SCHEDULE 40 PVC MAINLINE	5m	2 AIR RELIEF VALVE IR2.0 RAIN BIRD ARV050	1
50mm SCHEDULE 40 PVC SLEEVING	14m	3 FLUSH VALVE ASSEMBLY IR2.0	2
25mm CSA APPROVED DB2 ELECTRICAL CONDUIT	3m	4 DRIP ZONE KIT IR2.0 RAIN BIRD XCZ-100-PRB-COM	1
		5 ELECTRIC CONTROL VALVE IR2.0 RAIN BIRD 100-PEB	1
		6 BLOW-OUT ASSEMBLY IR2.0	1
		7 SPRAYHEAD SPRINKLER IR2.0 RAIN BIRD 1804-PRS w/ MPR NOZZLE	6
		8 IRRIGATION CONTROLLER IR2.0 RAIN BIRD ESPME3	1

ZONE NUMBER
VALVE SIZE
1 1" 1.8 GPM
ZONE FLOW

IRRIGATION NOTES

1. ALL IRRIGATION PRODUCTS, MATERIALS AND CONSTRUCTION SHALL CONFORM TO *SECTION 32 84 00 IRRIGATION SYSTEM SPECIFICATIONS*, UNLESS OTHERWISE NOTED ON PLANS.
2. CONTRACTOR SHALL SLEEVE ALL IRRIGATION AND WIRES UNDER ALL WALKWAYS, DRIVEWAYS, ROCK WALLS AND RETAINING WALLS. WATER LINES AND WIRE SHALL NOT SHARE SAME SLEEVE. SLEEVE SIZING SHALL BE TWICE THE THE DIAMETER OF IRRIGATION PIPE.
3. THE CONTRACTOR SHALL VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES AND SERVICES PRIOR TO CONSTRUCTION.
4. IRRIGATION PLANS ARE SCHEMATIC ONLY. ALL PLANT MATERIAL, LIGHT STANDARDS, HARD SURFACES OR AMENITIES TAKE PRECEDENCE OVER LOCATION OF IRRIGATION COMPONENTS.
5. CONTRACTOR TO CONFIRM 60psi @ 10gpm AVAILABLE AT SOURCE PRIOR TO INSTALLATION.
6. ALL ELECTRIC CONDUIT SHALL BE CSA NON-METALLIC DB2 PVC, GREY IN COLOUR.
7. INSTALL VALVES WITH MINIMUM 50mm CLEARANCE BETWEEN VALVE AND VALVE BOX, AND BETWEEN VALVE AND DRAIN ROCK.
8. WIRE SPLICES SHALL BE MADE w/ DRYCONN DBR/Y-600 OR 3M DBR/Y CONNECTORS & LOCATED AT ELECTRIC CONTROL ZONE VALVES.
9. INSTALL WIRE WITH MINIMUM 600mm LENGTH OF COILED SLACK AT ALL CHANGES OF DIRECTION, IN WIRE SPLICE BOXES AND AT CONNECTIONS TO CONTROLLED COMPONENTS.
10. SPRAYHEADS AND ROTORS SHALL BE ADJUSTED TO MINIMIZE OVERSPRAY ONTO ADJACENT SURFACES.
11. IF FIXED ARC NOZZLE DOES NOT FIT THE PRESCRIBED AREA, INSTALL RAIN BIRD HE-VAN AND ADJUST AS NECESSARY.
12. CONTRACTOR SHALL MONITOR CONTROLLER SETTINGS AND ADJUST REGULARLY TO ACCOUNT FOR SEASONAL WEATHER CHANGES TO ENSURE THAT PLANT WATER REQUIREMENTS ARE MET AND NOT EXCEEDED.
13. IDENTIFY ELECTRIC CONTROL VALVE WITH PERMANENT LABEL OR TAG INDICATING ZONE NUMBER OF VALVE.
14. CONTRACTOR SHALL CONFIRM LOCATION OF POINT OF CONNECTION AND CONTROLLER PRIOR TO INSTALLATION.
15. ALL WIRES SHALL BE 14 AWG DIRECT BURIAL WIRE, COMMON WIRE SHALL BE WHITE IN COLOUR, MASTER VALVE CONTROL WIRE SHALL BE RED IN COLOUR, CONTROL WIRES TO BE ORANGE, GREEN, YELLOW, BROWN OR BLACK IN COLOUR, SPARE WIRES TO BE BLUE IN COLOUR. COLOURS SHALL STAY CONSISTENT AND NOT CHANGE AT SPLICE.
16. CONTRACTOR SHALL ENSURE EACH DRIPLINE ZONE IS INSPECTED c/w COVERAGE TEST PRIOR TO BURIAL BY CONTRACT ADMINISTRATOR, IRRIGATION CONSULTANT, OR APPROVED PERSONNEL.
17. CONTRACTOR IS RESPONSIBLE TO CHECK AND CONFIRM ALL DIMENSIONS AND ELEVATIONS ON DRAWING.

IRRIGATION SCHEDULE

NOTE: IRRIGATION RUN TIMES ARE FOR ESTABLISHED PLANT MATERIAL ONLY.

						BASED ON PEAK DEMAND FOR MONTH OF JULY (ET=0.23"/DAY)				
ZONE	LANDSCAPE	SPRINKLER MAKE & MODEL	VALVE SIZE	DESIGN FLOW (GPM)	DESIGN PRESSURE (PSI)	PRECIPITATION RATE (IN/HR)	SOIL TYPE	INTERVAL DAYS	CYCLES PER RUN TIME	RUN TIME (MIN)
1	TURF	RAIN BIRD 1804-PRS	25mm	2.1	30	1.69	CLAY LOAM	2	1	17
2	SHRUB	RAIN BIRD XFSCV0912	25mm	3.7	40	0.96	CLAY LOAM	2	1	20
									TOTAL RUN TIME PER CYCLE:	20

REVISIONS / ISSUED				REVISIONS / ISSUED			
1	DEC 01/22	ISSUED FOR DP					
2	MAR 20/23	ISSUED FOR REVIEW					
3	MAR 29/23	ISSUED FOR DP					
NO.	DATE	DESCRIPTION		NO.	DATE	DESCRIPTION	

PROJECT
NOW WOMEN'S SHELTER, KELOWNA, BC

CLIENT
MK DESIGN GROUP, KELOWNA, BC

CONSULTANT
WATER PLAN IT IRRIGATION LTD.

SEAL

WATER PLAN IT IRRIGATION LTD.
IRRIGATION DESIGN | CONSULTING | PLANNING | EFFICIENCY
Kelowna BC t: 250.878.6178 www.waterplanit.ca

DESIGN BY	RH
DRAWN BY	JG
CHECKED BY	RH
PROJECT NO.	22-085
SCALE	AS SHOWN

SHEET TITLE
IRRIGATION PLAN

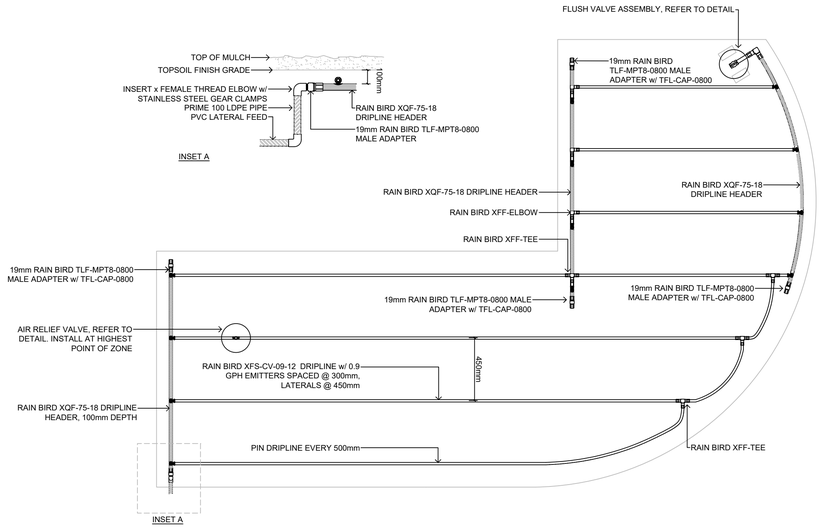
SHEET NO.
IR 1.0

SCHEDULE C

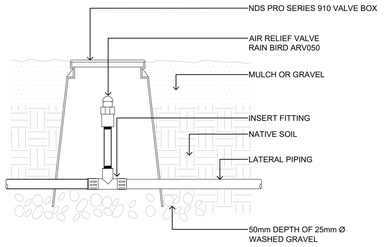
This forms part of application
DP22-0236

Planner Initials AC

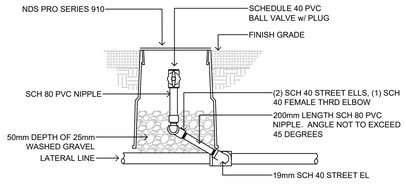
City of Kelowna
DEVELOPMENT PLANNING



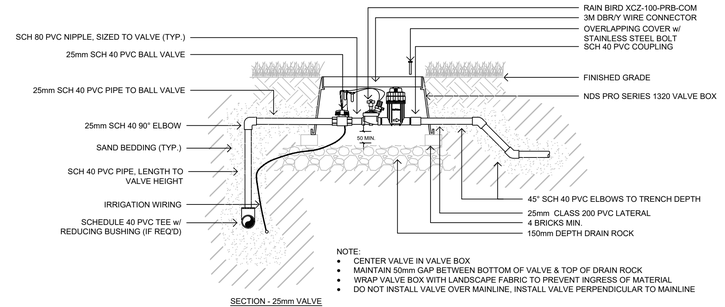
1 IR2.0 DRIPLINE LAYOUT
N.T.S.



2 IR2.0 AIR RELIEF VALVE
N.T.S.



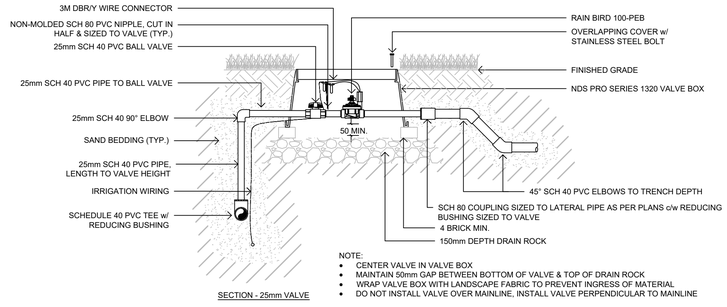
3 IR2.0 FLUSH VALVE
N.T.S.



NOTE:
- CENTER VALVE IN VALVE BOX
- MAINTAIN 50mm GAP BETWEEN BOTTOM OF VALVE & TOP OF DRAIN ROCK
- WRAP VALVE BOX WITH LANDSCAPE FABRIC TO PREVENT INGRESS OF MATERIAL
- DO NOT INSTALL VALVE OVER MAINLINE, INSTALL VALVE PERPENDICULAR TO MAINLINE

SECTION - 25mm VALVE

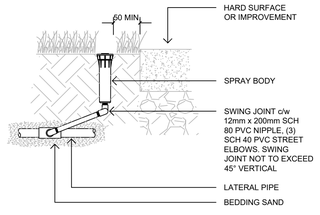
4 IR2.0 DRIP ZONE KIT
SCALE 1:15



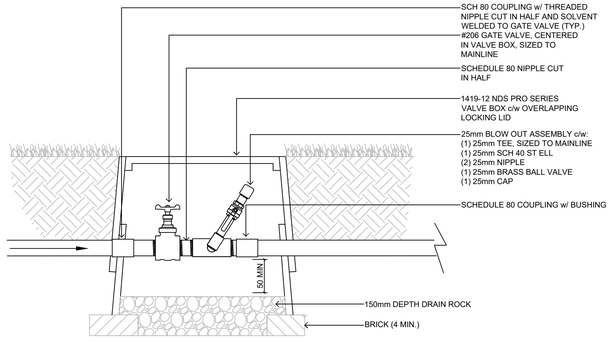
NOTE:
- CENTER VALVE IN VALVE BOX
- MAINTAIN 50mm GAP BETWEEN BOTTOM OF VALVE & TOP OF DRAIN ROCK
- WRAP VALVE BOX WITH LANDSCAPE FABRIC TO PREVENT INGRESS OF MATERIAL
- DO NOT INSTALL VALVE OVER MAINLINE, INSTALL VALVE PERPENDICULAR TO MAINLINE

SECTION - 25mm VALVE

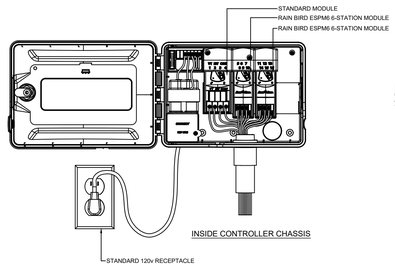
5 IR2.0 ELECTRIC CONTROL VALVE
SCALE 1:15

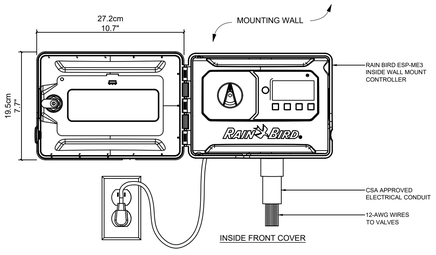


6 IR2.0 SPRAYHEAD SPRINKLER
SCALE 1:10

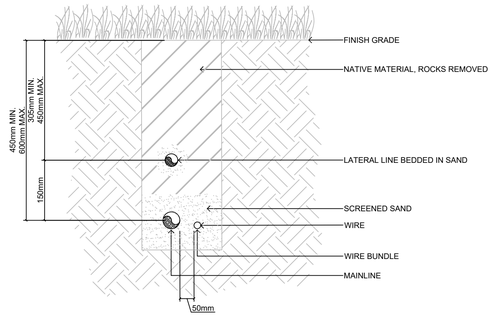


7 IR2.0 BLOW-OUT ASSEMBLY
N.T.S.





8 IR2.0 CONTROLLER
N.T.S.



9 IR2.0 TRENCH SECTION
N.T.S.

REVISIONS / ISSUED				REVISIONS / ISSUED			
1	DEC 01/22	ISSUED FOR DP					
2	MAR 20/23	ISSUED FOR REVIEW					
3	MAR 29/23	ISSUED FOR DP					
NO.	DATE	DESCRIPTION		NO.	DATE	DESCRIPTION	

PROJECT
NOW WOMEN'S SHELTER, KELOWNA, BC

CLIENT
MK DESIGN GROUP, KELOWNA, BC

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Kelowna BC t. 250.878.6178 www.waterplanit.ca

DESIGN BY	RH
DRAWN BY	JG
CHECKED BY	RH
PROJECT NO.	22-085
SCALE	AS SHOWN

SHEET TITLE
IRRIGATION DETAILS

SHEET NO.
IR 2.0

Consideration has been given to the following guidelines as identified in Chapter 18 of the City of Kelowna 2040 Official Community Plan:

SECTION 2.0: GENERAL RESIDENTIAL AND MIXED USE						
RATE PROPOSALS COMPLIANCE TO PERTINENT GUIDELINE *(1 is least complying & 5 is highly complying)*	**N/A**	**1**	**2**	**3**	**4**	**5**
2.1 General residential & mixed use guidelines						
2.1.1 Relationship to the Street	**N/A**	**1**	**2**	**3**	**4**	**5**
a. Orient primary building facades and entries to the fronting street or open space to create street edge definition and activity.						✓
b. On corner sites, orient building facades and entries to both fronting streets.	✓					
c. Minimize the distance between the building and the sidewalk to create street definition and a sense of enclosure.						✓
d. Locate and design windows, balconies, and street-level uses to create active frontages and 'eyes on the street', with additional glazing and articulation on primary building facades.					✓	
e. Ensure main building entries are clearly visible with direct sight lines from the fronting street.						✓
f. Avoid blank, windowless walls along streets or other public open spaces.					✓	
g. Avoid the use of roll down panels and/or window bars on retail and commercial frontages that face streets or other public open spaces.	✓					
h. In general, establish a street wall along public street frontages to create a building height to street width ratio of 1:2, with a minimum ratio of 1:3 and a maximum ration of 1:1.75. • Wider streets (e.g. transit corridors) can support greater street wall heights compared to narrower streets (e.g. local streets); • The street wall does not include upper storeys that are setback from the primary frontage; and • A 1:1 building height to street width ratio is appropriate for a lane or mid-block connection condition provided the street wall height is no greater than 3 storeys.						✓
2.1.2 Scale and Massing	**N/A**	**1**	**2**	**3**	**4**	**5**
a. Provide a transition in building height from taller to shorter buildings both within and adjacent to the site with consideration for future land use direction.						✓
b. Break up the perceived mass of large buildings by incorporating visual breaks in facades.					✓	
c. Step back the upper storeys of buildings and arrange the massing and siting of buildings to: • Minimize the shadowing on adjacent buildings as well as public and open spaces such as sidewalks, plazas, and courtyards; and • Allow for sunlight onto outdoor spaces of the majority of ground floor units during the winter solstice.						✓

2.1.3 Site Planning	N/A	1	2	3	4	5
a. Site and design buildings to respond to unique site conditions and opportunities, such as oddly shaped lots, location at prominent intersections, framing of important open spaces, corner lots, sites with buildings that terminate a street end view, and views of natural features.					✓	
b. Use Crime Prevention through Environmental Design (CPTED) principles to better ensure public safety through the use of appropriate lighting, visible entrances, opportunities for natural surveillance, and clear sight lines for pedestrians.						✓
c. Limit the maximum grades on development sites to 30% (3:1)						✓
d. Design buildings for 'up-slope' and 'down-slope' conditions relative to the street by using strategies such as: • Stepping buildings along the slope, and locating building entrances at each step and away from parking access where possible; • Incorporating terracing to create usable open spaces around the building • Using the slope for under-building parking and to screen service and utility areas; • Design buildings to access key views; and • Minimizing large retaining walls (retaining walls higher than 1 m should be stepped and landscaped).	✓					
e. Design internal circulation patterns (street, sidewalks, pathways) to be integrated with and connected to the existing and planed future public street, bicycle, and/or pedestrian network.						✓
f. Incorporate easy-to-maintain traffic calming features, such as on-street parking bays and curb extensions, textured materials, and crosswalks.	✓					
g. Apply universal accessibility principles to primary building entries, sidewalks, plazas, mid-block connections, lanes, and courtyards through appropriate selection of materials, stairs, and ramps as necessary, and the provision of wayfinding and lighting elements.						✓
2.1.4 Site Servicing, Access, and Parking	**N/A**	**1**	**2**	**3**	**4**	**5**
a. Locate off-street parking and other 'back-of-house' uses (such as loading, garbage collection, utilities, and parking access) away from public view.						✓
b. Ensure utility areas are clearly identified at the development permit stage and are located to not unnecessarily impact public or common open spaces.						✓
c. Avoid locating off-street parking between the front façade of a building and the fronting public street.						✓
d. In general, accommodate off-street parking in one of the following ways, in order of preference: • Underground (where the high water table allows)						✓

• Parking in a half-storey (where it is able to be accommodated to not negatively impact the street frontage); • Garages or at-grade parking integrated into the building (located at the rear of the building); and • Surface parking at the rear, with access from the lane or secondary street wherever possible.						
e. Design parking areas to maximize rainwater infiltration through the use of permeable materials such as paving blocks, permeable concrete, or driveway planting strips.					✓	
f. In cases where publicly visible parking is unavoidable, screen using strategies such as: • Landscaping; • Trellises; • Grillwork with climbing vines; or • Other attractive screening with some visual permeability.	✓					
g. Provide bicycle parking at accessible locations on site, including: • Covered short-term parking in highly visible locations, such as near primary building entrances; and • Secure long-term parking within the building or vehicular parking area.						✓
h. Provide clear lines of site at access points to parking, site servicing, and utility areas to enable casual surveillance and safety.						✓
i. Consolidate driveway and laneway access points to minimize curb cuts and impacts on the pedestrian realm or common open spaces.						✓
j. Minimize negative impacts of parking ramps and entrances through treatments such as enclosure, screening, high quality finishes, sensitive lighting and landscaping.						✓
2.1.5 Streetscapes, Landscapes, and Public Realm Design	**N/A**	**1**	**2**	**3**	**4**	**5**
a. Site buildings to protect mature trees, significant vegetation, and ecological features.					✓	
b. Locate underground parkades, infrastructure, and other services to maximize soil volumes for in-ground plantings.	✓					
c. Site trees, shrubs, and other landscaping appropriately to maintain sight lines and circulation.						✓
d. Design attractive, engaging, and functional on-site open spaces with high quality, durable, and contemporary materials, colors, lighting, furniture, and signage.					✓	
e. Ensure site planning and design achieves favourable microclimate outcomes through strategies such as: • Locating outdoor spaces where they will receive ample sunlight throughout the year; • Using materials and colors that minimize heat absorption; • Planting both evergreen and deciduous trees to provide a balance of shading in the summer and solar access in the winter; and • Using building mass, trees and planting to buffer wind.					✓	

f. Use landscaping materials that soften development and enhance the public realm.						✓
g. Plant native and/or drought tolerant trees and plants suitable for the local climate.						✓
h. Select trees for long-term durability, climate and soil suitability, and compatibility with the site's specific urban conditions.						✓
i. Design sites and landscapes to maintain the pre-development flows through capture, infiltration, and filtration strategies, such as the use of rain gardens and permeable surfacing.						✓
j. Design sites to minimize water use for irrigation by using strategies such as: • Designing planting areas and tree pits to passively capture rainwater and stormwater run-off; and • Using recycled water irrigation systems.					✓	
k. Create multi-functional landscape elements wherever possible, such as planting areas that also capture and filter stormwater or landscape features that users can interact with.				✓		
l. Select materials and furnishings that reduce maintenance requirements and use materials and site furnishings that are sustainably sourced, re-purposed or 100% recycled.						✓
m. Use exterior lighting to complement the building and landscape design, while: • Minimizing light trespass onto adjacent properties; • Using full cut-off lighting fixtures to minimize light pollution; and • Maintaining lighting levels necessary for safety and visibility.					✓	
n. Employ on-site wayfinding strategies that create attractive and appropriate signage for pedestrians, cyclists, and motorists using a 'family' of similar elements.	✓					
2.1.6 Building Articulation, Features and Materials	**N/A**	**1**	**2**	**3**	**4**	**5**
a. Express a unified architectural concept that incorporates variation in façade treatments. Strategies for achieving this include: • Articulating facades by stepping back or extending forward a portion of the façade to create a series of intervals or breaks; • Repeating window patterns on each step-back and extension interval; • Providing a porch, patio, or deck, covered entry, balcony and/or bay window for each interval; and • Changing the roof line by alternating dormers, stepped roofs, gables, or other roof elements to reinforce each interval.						✓
b. Incorporate a range of architectural features and details into building facades to create visual interest, especially when approached by pedestrians. Include architectural features such as: bay windows and balconies; corner feature accents, such as turrets or cupolas; variations in roof height, shape and detailing; building entries; and canopies and overhangs.					✓	

Include architectural details such as: Masonry such as tiles, brick, and stone; siding including score lines and varied materials to distinguish between floors; articulation of columns and pilasters; ornamental features and art work; architectural lighting; grills and railings; substantial trim details and moldings / cornices; and trellises, pergolas, and arbors.						
c. Design buildings to ensure that adjacent residential properties have sufficient visual privacy (e.g. by locating windows to minimize overlook and direct sight lines into adjacent units), as well as protection from light trespass and noise.					✓	
d. Design buildings such that their form and architectural character reflect the buildings internal function and use.						✓
e. Incorporate substantial, natural building materials such as masonry, stone, and wood into building facades.						✓
f. Provide weather protection such as awnings and canopies at primary building entries.						✓
g. Place weather protection to reflect the building's architecture.						✓
h. Limit signage in number, location, and size to reduce visual clutter and make individual signs easier to see.						✓
i. Provide visible signage identifying building addresses at all entrances.						✓

SECTION 4.0: LOW & MID-RISE RESIDENTIAL MIXED USE						
RATE PROPOSALS COMPLIANCE TO PERTINENT GUIDELINE *(1 is least complying & 5 is highly complying)*	**N/A**	**1**	**2**	**3**	**4**	**5**
4.1 Low & mid-rise residential & mixed use guidelines						
4.1.1 Relationship to the Street	**N/A**	**1**	**2**	**3**	**4**	**5**
i. Ensure lobbies and main building entries are clearly visible from the fronting street.						✓
j. Avoid blank walls at grade wherever possible by: • Locating enclosed parking garages away from street frontages or public open spaces; • Using ground-oriented units or glazing to avoid creating dead frontages; and • When unavoidable, screen blank walls with landscaping or incorporate a patio café or special materials to make them more visually interesting.					✓	
4.1.2 Scale and Massing	**N/A**	**1**	**2**	**3**	**4**	**5**
a. Residential building facades should have a maximum length of 60 m. A length of 40 m is preferred.						✓
b. Residential buildings should have a maximum width of 24 m.						✓
c. Buildings over 40 m in length should incorporate a significant horizontal and vertical break in the façade.	✓					

d. For commercial facades, incorporate a significant break at intervals of approximately 35 m.	✓					
4.1.3 Site Servicing, Access, and Parking	**N/A**	**1**	**2**	**3**	**4**	**5**
a. On sloping sites, floor levels should step to follow natural grade and avoid the creation of blank walls.	✓					
b. Site buildings to be parallel to the street and to have a distinct front-to-back orientation to public street and open spaces and to rear yards, parking, and/or interior court yards: • Building sides that interface with streets, mid-block connections and other open spaces and should positively frame and activate streets and open spaces and support pedestrian activity; and • Building sides that are located away from open spaces (building backs) should be designed for private/shared outdoor spaces and vehicle access.						✓
c. Break up large buildings with mid-block connections which should be publicly-accessible wherever possible.	✓					
d. Ground floors adjacent to mid-block connections should have entrances and windows facing the mid-block connection.	✓					
4.1.4 Site Servicing, Access and Parking	**N/A**	**1**	**2**	**3**	**4**	**5**
a. Vehicular access should be from the lane. Where there is no lane, and where the re-introduction of a lane is difficult or not possible, access may be provided from the street, provided: • Access is from a secondary street, where possible, or from the long face of the block; • Impacts on pedestrians and the streetscape is minimised; and • There is no more than one curb cut per property.						✓
b. Above grade structure parking should only be provided in instances where the site or high water table does not allow for other parking forms and should be screened from public view with active retail uses, active residential uses, architectural or landscaped screening elements.						✓
c. Buildings with ground floor residential may integrate half-storey underground parking to a maximum of 1.2 m above grade, with the following considerations: • Semi-private spaces should be located above to soften the edge and be at a comfortable distance from street activity; and • Where conditions such as the high water table do not allow for this condition, up to 2 m is permitted, provided that entryways, stairs, landscaped terraces, and patios are integrated and that blank walls and barriers to accessibility are minimized.					✓	
4.1.5 Publicly-Accessible and Private Open Spaces	**N/A**	**1**	**2**	**3**	**4**	**5**
a. Integrate publicly accessible private spaces (e.g. private courtyards accessible and available to the public) with public open areas to create seamless, contiguous spaces.					✓	

b. Locate semi-private open spaces to maximize sunlight penetration, minimize noise disruptions, and minimize 'overlook' from adjacent units.					✓	
4.1.6 Building Articulation, Features, and Materials	**N/A**	**1**	**2**	**3**	**4**	**5**
a. Articulate building facades into intervals that are a maximum of 15 m wide for mixed-use buildings and 20 m wide for residential buildings. Strategies for articulating buildings should consider the potential impacts on energy performance and include: • Façade Modulation – stepping back or extending forward a portion of the façade to create a series of intervals in the façade; • Repeating window pattern intervals that correspond to extensions and step backs (articulation) in the building façade; • Providing a porch, patio, deck, or covered entry for each interval; • Providing a bay window or balcony for each interval, while balancing the significant potential for heat loss through thermal bridge connections which could impact energy performance; • Changing the roof line by alternating dormers, stepped roofs, gables, or other roof elements to reinforce the modulation or articulation interval; • Changing the materials with the change in building plane; and • Provide a lighting fixture, trellis, tree or other landscape feature within each interval.						✓
b. Break up the building mass by incorporating elements that define a building's base, middle and top.						✓
c. Use an integrated, consistent range of materials and colors and provide variety, by for example, using accent colors.						✓
d. Articulate the façade using design elements that are inherent to the buildings as opposed to being decorative. For example, create depth in building facades by recessing window frames or partially recessing balconies to allow shadows to add detail and variety as a byproduct of massing.						✓
e. Incorporate distinct architectural treatments for corner sites and highly visible buildings such as varying the roofline, articulating the façade, adding pedestrian space, increasing the number and size of windows, and adding awnings or canopies.	✓					
f. Provide weather protection (e.g. awnings, canopies, overhangs, etc.) along all commercial streets and plazas with particular attention to the following locations: • Primary building entrances;, • Adjacent to bus zones and street corners where people wait for traffic lights; • Over store fronts and display windows; and • Any other areas where significant waiting or browsing by people occurs.						✓
g. Architecturally-integrate awnings, canopies, and overhangs to the building and incorporate architectural design features of buildings from which they are supported.						✓

h.	Place and locate awnings and canopies to reflect the building's architecture and fenestration pattern.					✓	
i.	Place awnings and canopies to balance weather protection with daylight penetration. Avoid continuous opaque canopies that run the full length of facades.					✓	
j.	Provide attractive signage on commercial buildings that identifies uses and shops clearly but which is scaled to the pedestrian rather than the motorist. Some exceptions can be made for buildings located on highways and/or major arterials in alignment with the City's Sign Bylaw.	✓					
k.	Avoid the following types of signage: • Internally lit plastic box signs; • Pylon (stand alone) signs; and • Rooftop signs.	✓					
l.	Uniquely branded or colored signs are encouraged to help establish a special character to different neighbourhoods.	✓					

NEW TOWN SERVICES

ATTACHMENT C
This forms part of application
DP22-0236
Planner Initials AC
City of Kelowna
DEVELOPMENT PLANNING

Proposal for Development Permit

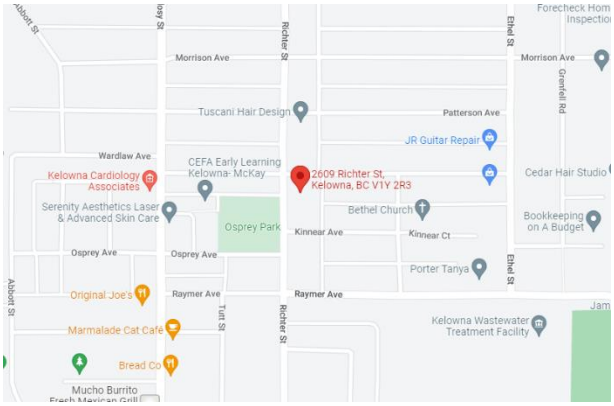
2609-2611 Richter St

Introduction

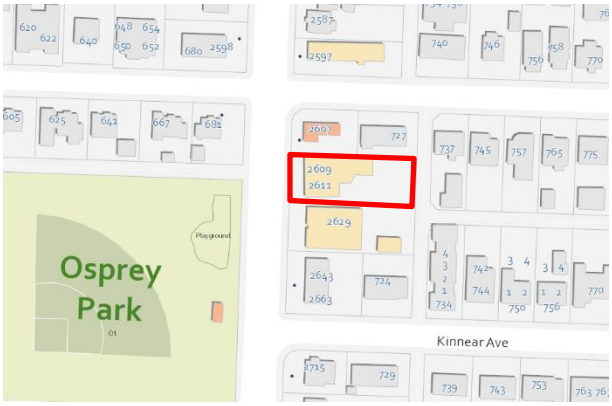
This application is for a Development Permit to facilitate the construction of a unique, energy efficient building focused on offering a Women's shelter and supportive housing services.

Site Context and Land Use

The subject site consists of a single legal parcel, upon which exists a 1950's era building operated as a group home by the NOW Canada Society. The site is designated and zoned as Urban Centre (UC5) under both the OCP and Zoning bylaw. The neighboring property to the North consists of a Telus-owned industrial structure, and the property to the South is Ozanam House, a men's recovery facility.



Site Location
Source: Google Map



Site Context
Source: City of Kelowna

Proposal Overview

The NOW Canada Society would like to undertake a Development Permit to construct a 5-storey building with an integrated continuum of care ranging from emergency shelter services into supportive housing. This is a BC Housing funded project that will provide shelter and below-market rental homes to women and children. To facilitate this outcome, the approval of a Form and Character Development Permit is required.

The structure has been designed with significant contemporary influence and hosts a very modern appearance with a mix of high-quality cladding materials. The building steps back on both side yards above 2 storeys to reduce the massing impact on neighboring properties. Parking is accessed from the rear lane and constitutes most of the 1st floor due to high water table conditions. Pedestrian access comes via the Richter St frontage. Shelter services constitute the 2nd floor level, with supportive housing on floors 3-5.

Landscaping along the Richter frontage is robust, and fully meets the requirements in S7.2 of the zoning bylaw with provision of two street-interfacing trees within a 3m landscape buffer. A 1.8m solid screen vinyl

fence will serve as an attractive buffer along the North property line, and the southern portion of the property line alongside the parking stall.

Conclusion

The project provides homes for a vulnerable segment of the population who need safe, affordable housing in the downtown core. Focusing this type of gentle medium density, within an Urban Centre, locates more residents within walking/biking distance of jobs, shopping, and services. Furthermore, this project is offered on an already zoned site, with no proposed variances. The applicant kindly requests support from staff and council on this application.

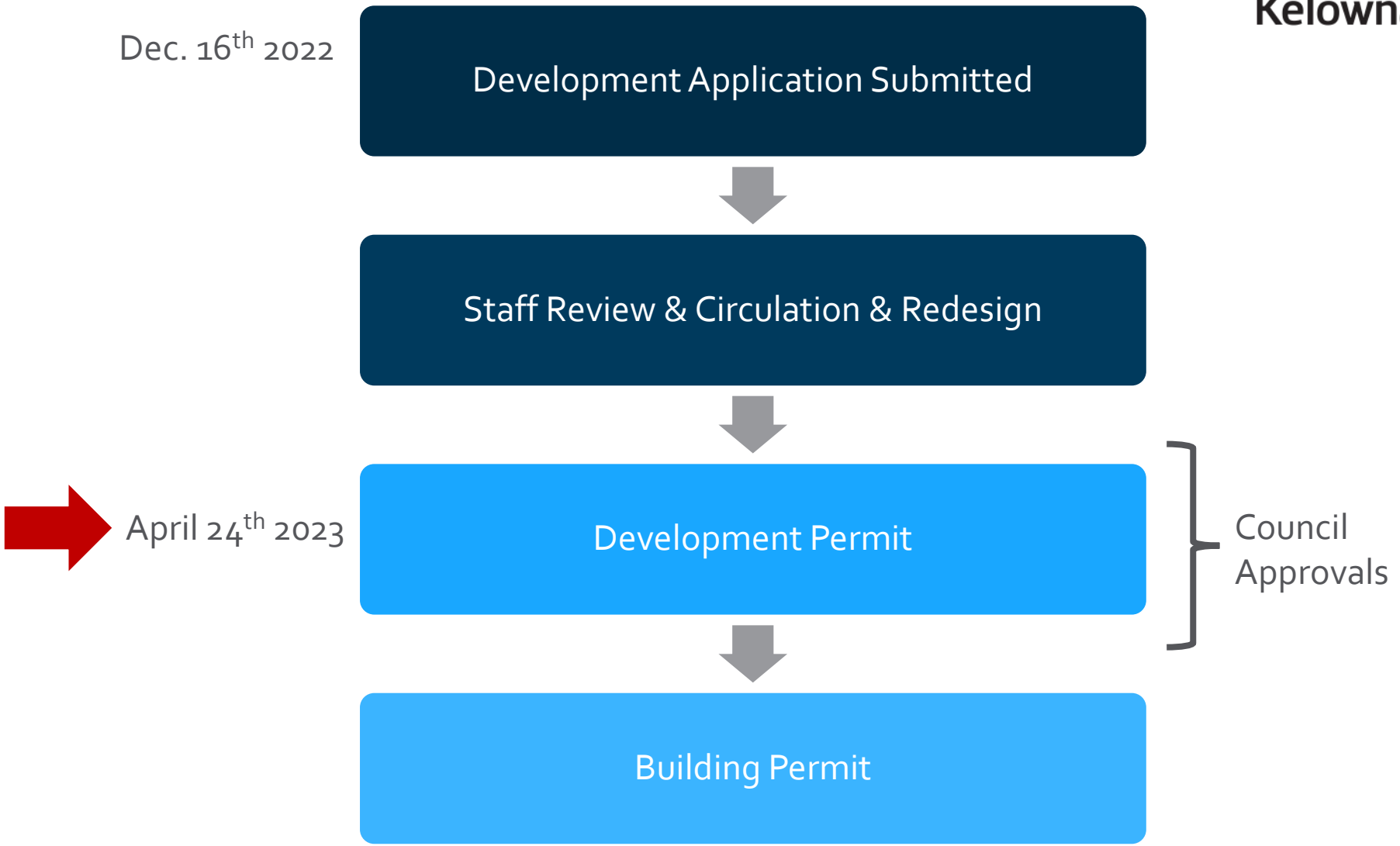
DP22-0236
2609-2611 Richter Street

Development Permit

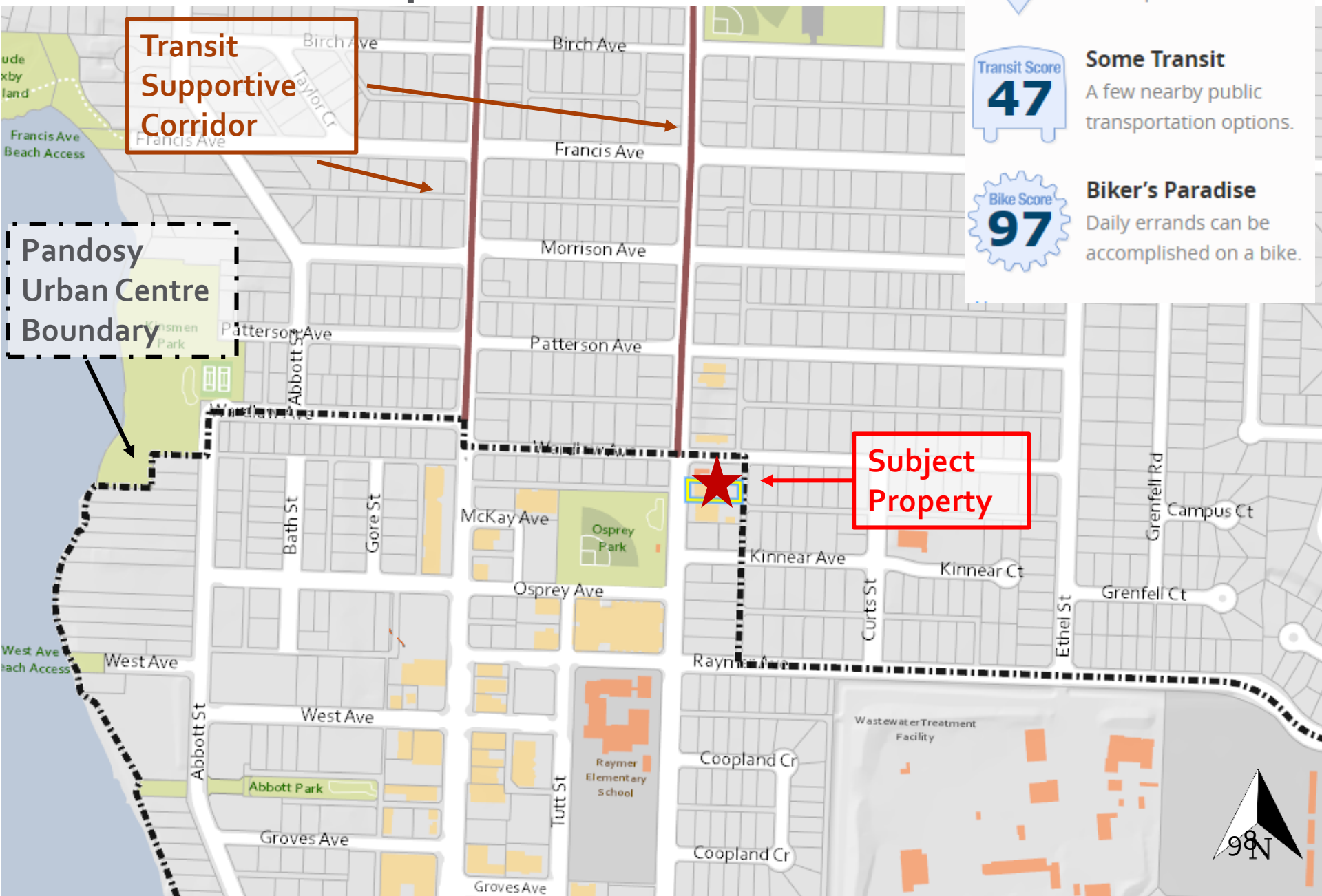
Purpose

- To issue a Development Permit for the form and character of a 5-storey building offering a women's shelter and supportive housing services.

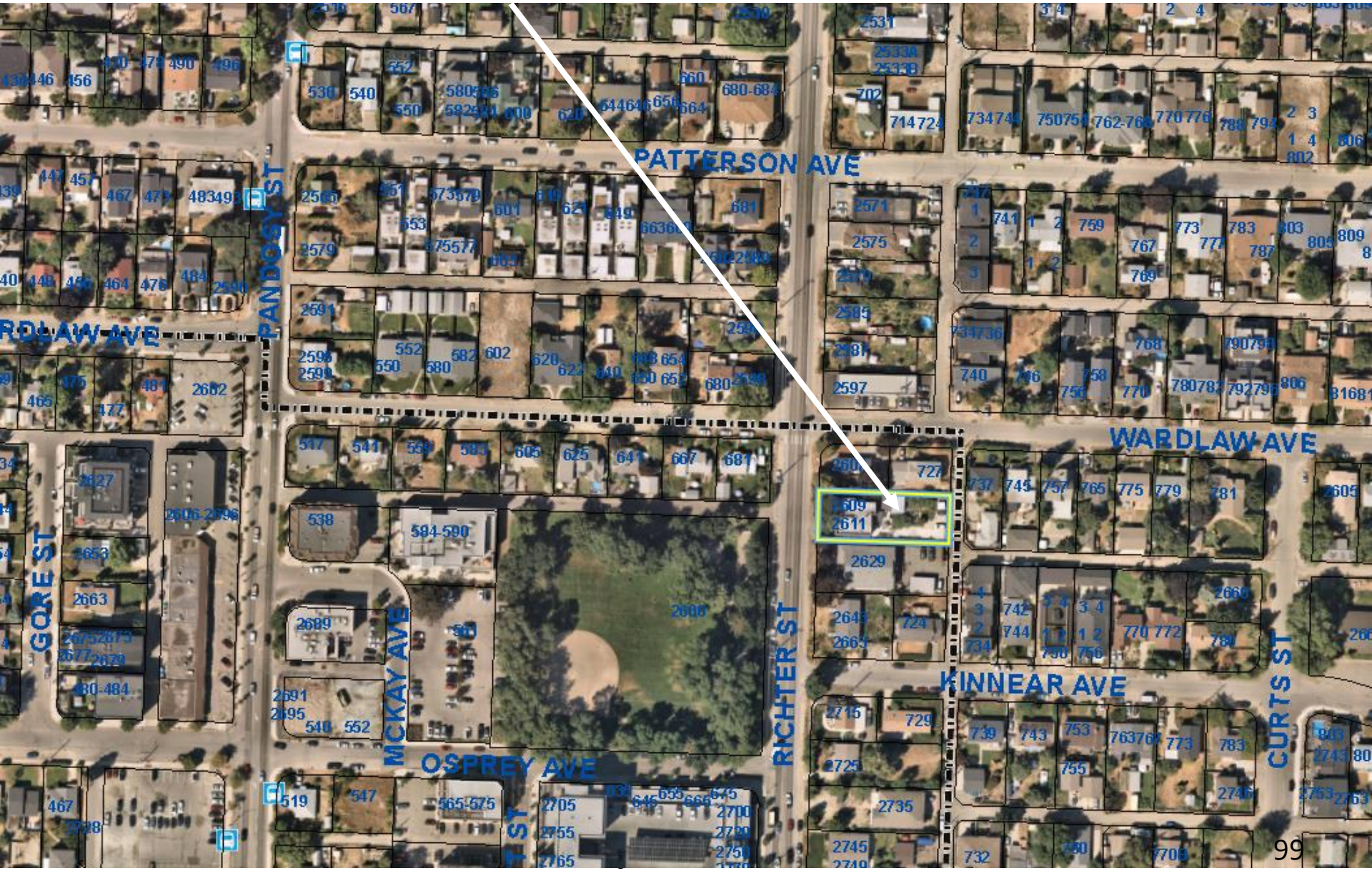
Development Process



Context Map


Transit Supportive Corridor
Pandosy Urban Centre Boundary
Subject Property
Walk Score 81
Very Walkable
Most errands can be accomplished on foot.
Transit Score 47
Some Transit
A few nearby public transportation options.
Bike Score 97
Biker's Paradise
Daily errands can be accomplished on a bike.
Birch Ave
Francis Ave
Morrison Ave
Patterson Ave
Abbott St
Bath St
Gore St
McKay Ave
Osprey Park
Osprey Ave
Kinnear Ave
Kinnear Ct
Curts St
Ethel St
Grenfell Rd
Grenfell Ct
Campus Ct
West Ave
Abbott Park
Groves Ave
Tutt St
Raymer Elementary School
Coopland Cr
Wastewater Treatment Facility
Francis Ave Beach Access
West Ave Beach Access
N

Subject Property Map



Subject Property Map

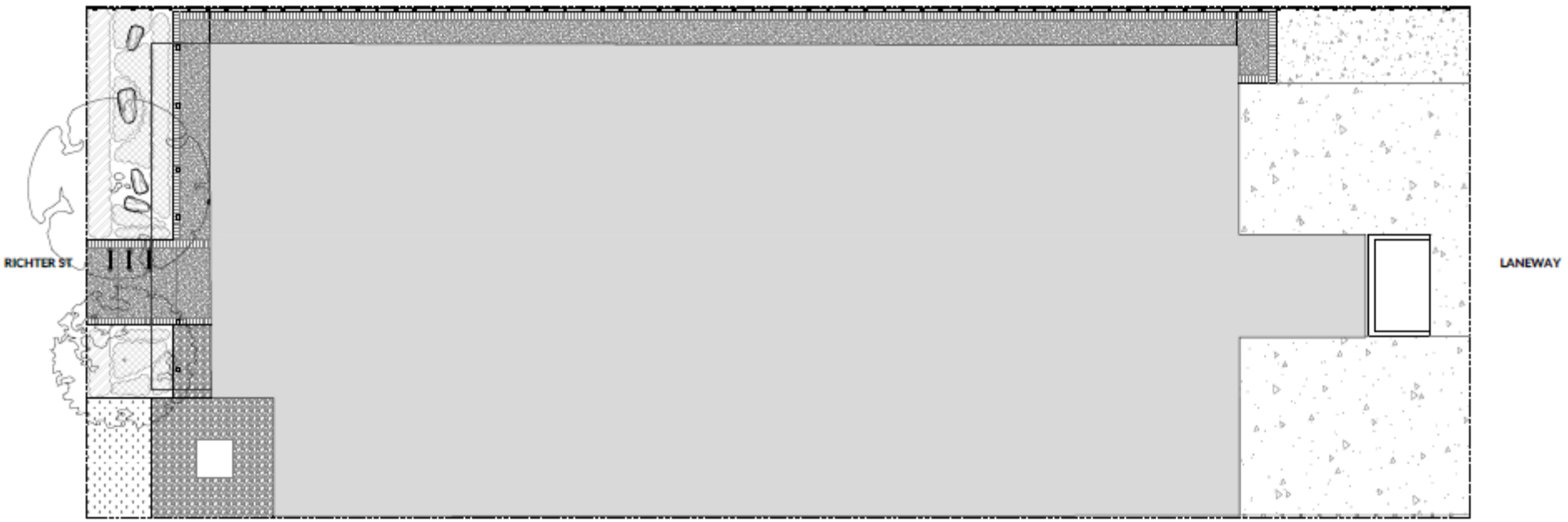
Subject Property Map

Technical Details

- Women's Shelter and Supportive Housing
  - 10 unit shelter on floor 2
  - 24 unit supportive housing on floor 3 to 5
  - 20 Parking Stalls
  - 14 Bicycle Parking Stalls

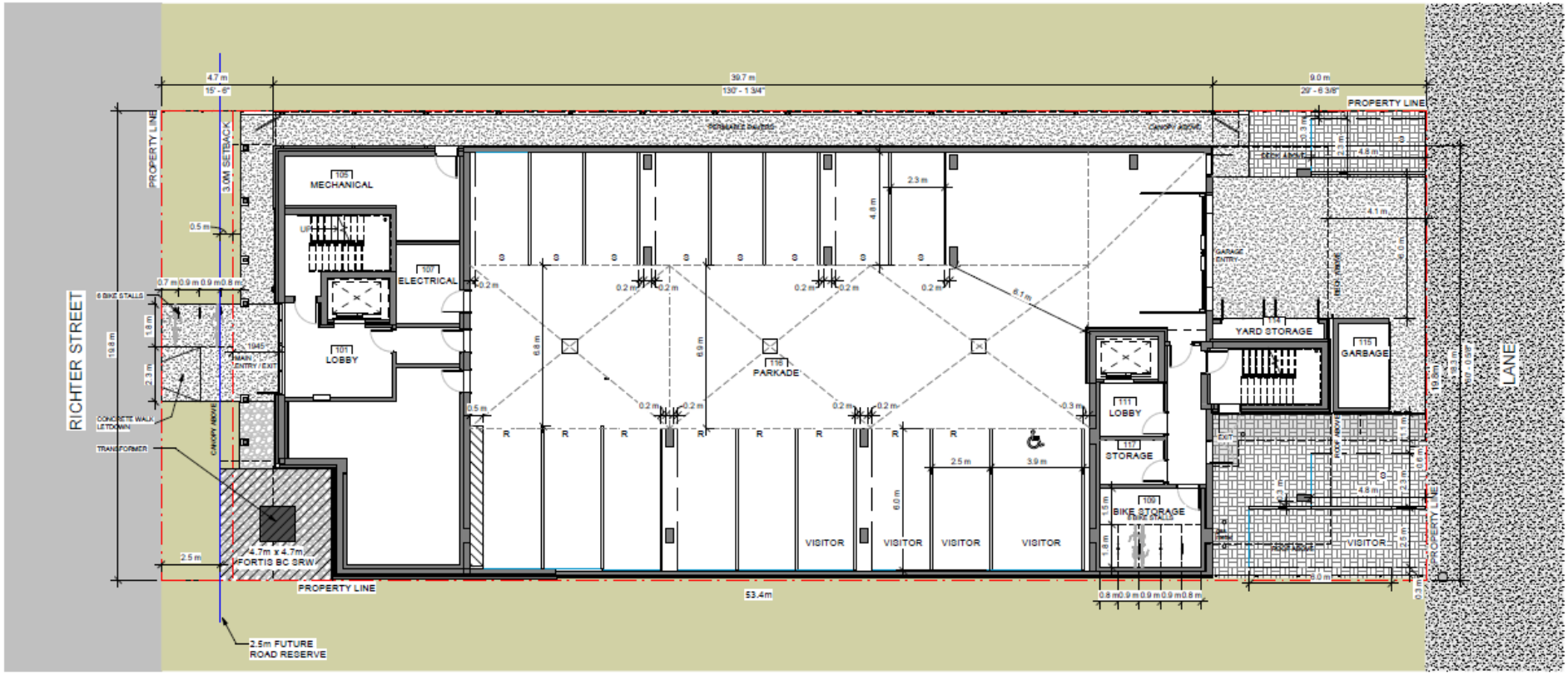
Site Plan & Landscape Plan

Site Plan Overview - 1:100



Springfield Rd

Level 1 and Parkade



Springfield Rd

Floors Two & Three Plans

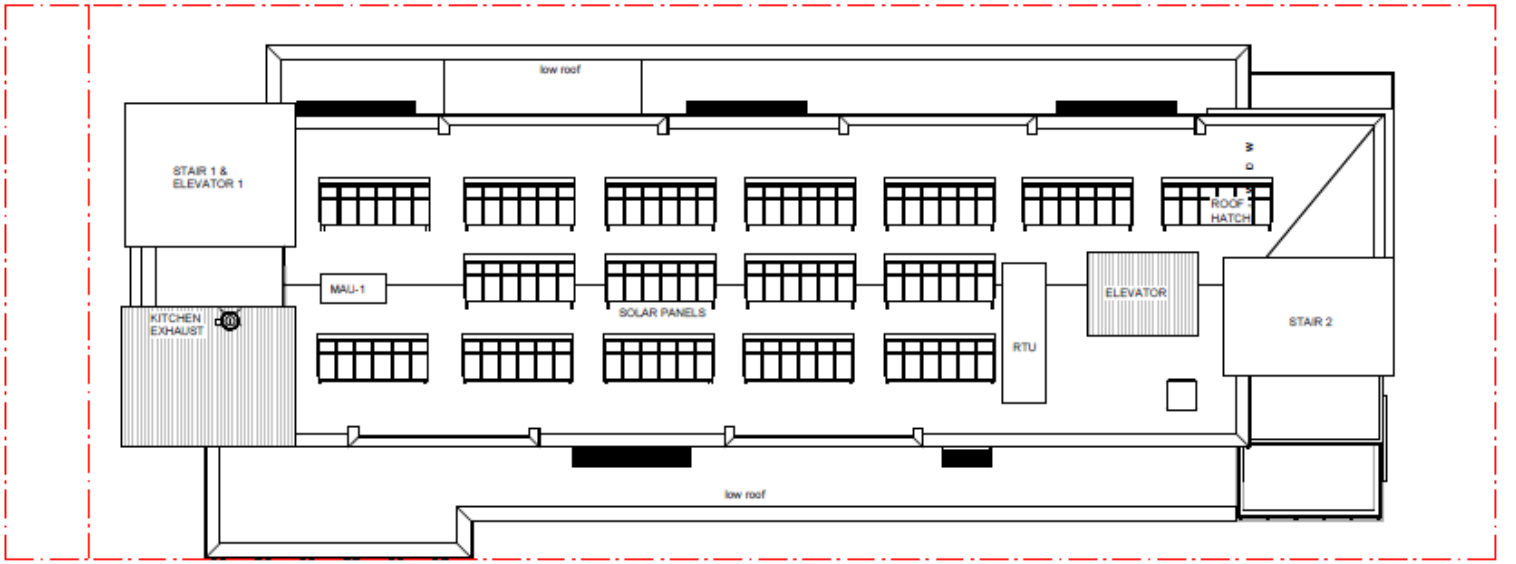
2nd Storey

3rd Storey

Floors Four, Five, & Roof Plans

4th & 5th Storey

Roof Plan



ROOF PLAN

Materials Board

LUX ALUMINUM WOOD GRAIN VERTICAL (#1)

FIBER CEMENT PANEL - WHITE (#2)

FIBER CEMENT PANEL - BLUE (#4)

FIBER CEMENT PANEL - BLACK (#6)

FIBER CEMENT PANEL - GREY (#3)

BRICK VENEER - GREY (#8)

CONCRETE WALL / COLUMN (#8 & #9)

GLASS RAILING (#10)

Elevation – West and East

West

East

Elevation – North

NORTH ELEVATION

Elevation – South

Rendering – NE

VIEW LOOKING NORTH EAST - FRONT ELEVATION

Rendering – SE

VIEW LOOKING SOUTH EAST - FRONT ELEVATION

Rendering – NW

VIEW LOOKING NORTH WEST - REAR ELEVATION

Rendering – NW

VIEW LOOKING SOUTH WEST - REAR ELEVATION

OCP Policies & Design Guidelines

- Diverse Housing Form
- Diverse Housing Tenure
- Housing with Supports
- Appropriate height and scale
  - Within OCP Building Height Map
- Appropriate Form and Function
  - Within Residential Character as stated by OCP Retail Street Map

cil

Staff Recommendation

- Staff recommend **support** for the proposed Development Permit as it:
  - Aligns with OCP Chapter 5 Policies
  - Meets majority of OCP Design Guidelines
  - No Variances

Report to Council

Date:	April 24, 2023
To:	Council
From:	City Manager
Subject:	2023 Financial Plan – Final Budget Volume
Department:	Financial Planning

Recommendation:

THAT Council adopts the 2023-2027 Financial Plan;

AND THAT Council approves the formulation of 2023 Property Tax Rates that will raise the required funds in 2023, from General Taxation, in the amount of $176,624,339 resulting in an average net property owner impact of 3.78 per cent;

AND THAT Bylaw No. 12502 being the 2023-2027 Five-Year Financial Plan, 2023 be advanced for reading consideration;

AND THAT Bylaw No. 12503 being the Tax Structure Bylaw, 2023 be advanced for reading consideration;

AND THAT Bylaw No. 12504 being the Annual Tax Rates Bylaw, 2023 be advanced for reading consideration;

AND THAT Bylaw No. 12505 being the DCC Reserve Fund Expenditure Bylaw, 2023 be advanced for reading consideration;

AND THAT Bylaw No. 12508 being the Septic Removal Specified Area Reserve Fund Expenditure Bylaw, 2023 be advanced for reading consideration;

AND FUTHER THAT Bylaw No. 12506 being the Sale of City Owned Land Reserve Fund Expenditure Bylaw, 2023 be advanced for reading consideration.

Purpose:
To present the 2023 Final Budget Volume submissions, the 2023-2027 Financial Plan and related bylaws to Council for their consideration and approval.

Background:
Council approved the 2023 Financial Plan – Preliminary volume on December 8, 2022 and the addition of the 2023 Financial Plan – Carryover Budget volume on March 20, 2023. The 2023 Financial Plan - Final Budget volume includes emergent, legislated or Council directed requests. The three volumes provide the 2023 portion of the 2023-2027 Five Year Financial Plan. Depending on the nature of the item being considered within Final Budget, the adjustments could cause the final tax demand to increase or decrease.

The City of Kelowna's strong financial management and clear budgeting practices continue to allow the delivery of essential services residents expect while maintaining, expanding, and building infrastructure that makes Kelowna a great place to live. The 2023 Final Budget as proposed, reflects a net municipal property tax increase of 3.78 per cent, a 0.2 per cent decrease to the Preliminary Budget tax requirement approved in December 2022, of 3.80 per cent.

The largest Final Budget request affecting taxation can be attributed to the H2O facility air handling renewal request which is offset by an increase in new construction revenue and the FortisBC franchise fee revenue. Information about the requested changes are included in the attached 2023 Final Budget Volume.

A tax rate of 3.78 per cent means the owner of a residential property with an average assessed value of $1,009,350 will pay $2,373 which is an increase of $87 from the prior year for the municipal portion of their property taxes.

Considerations applicable to this report:
Legal/Statutory Authority:
In Section 165 of the Community Charter regarding Financial Plans, adoption of a 5 Year Financial Plan bylaw is required prior to the annual property tax bylaw. Under the Annual Property Tax Bylaw Section 197 of the Community Charter, Council must establish tax rates by bylaw after adoption of the financial plan but before May 15th.

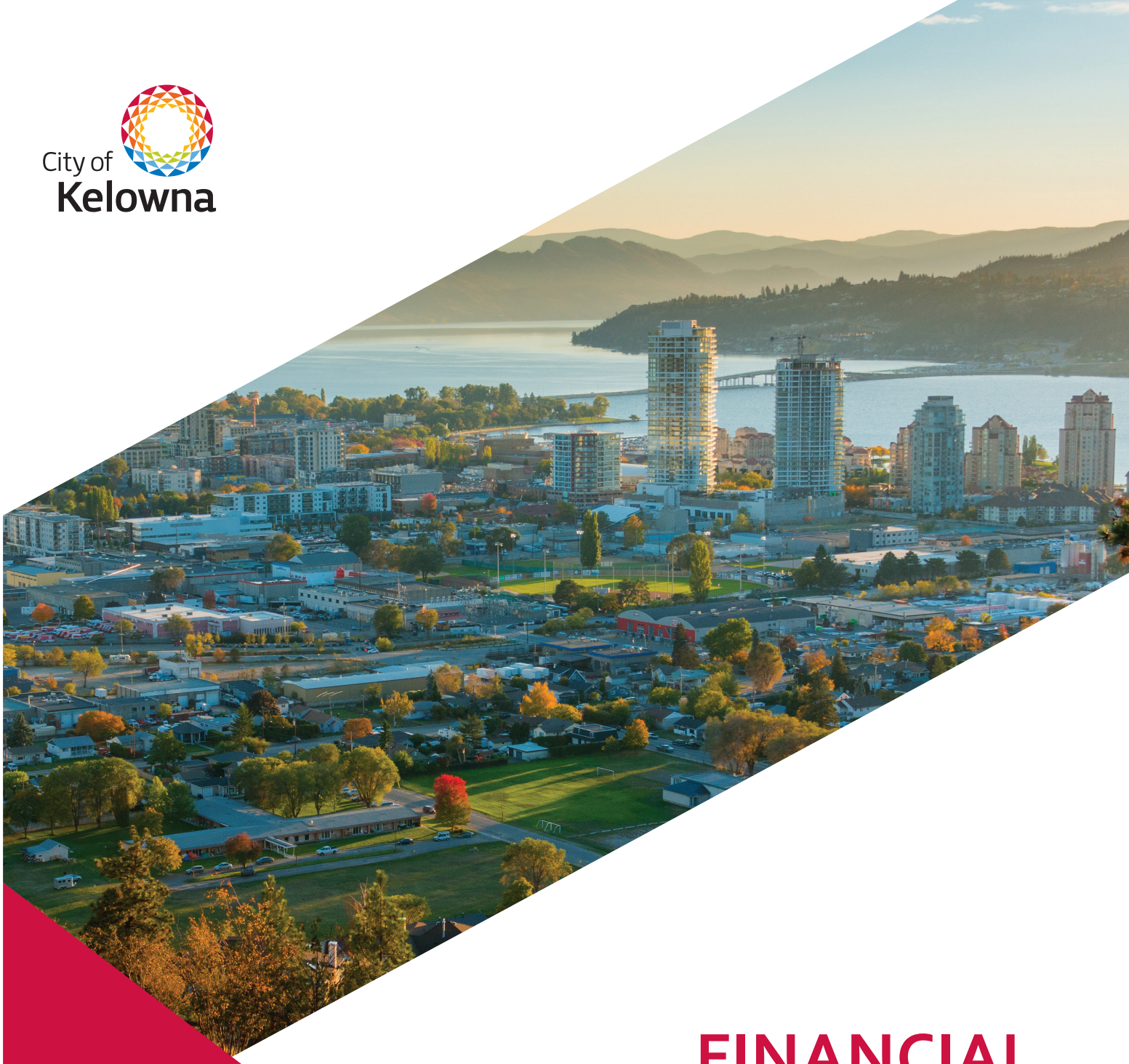
Considerations not applicable to this report:
Legal/Statutory Procedural Requirements:
Existing Policy:
Financial/Budgetary Considerations:
External Agency/Public Comments:
Communications Comments:

Submitted by:
M. Antunes, CPA Financial Planning Manager

Approved for inclusion: J. Sass, CA, CPA Director of Financial Services

Attachment:
1: 2023 Financial Plan – Final Budget Volume
2. 2023-2027 Five-Year Financial Plan
3: 2023 Financial Plan Presentation

City of Kelowna



FINANCIAL PLAN

Kelowna, BC Canada
Final Budget - Volume 3

2023

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Report to Council

Date: April 24, 2023

To: Council

From: City Manager

Subject: 2023 Financial Plan – Final Budget Volume

Department: Financial Planning

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External Agency/Public Comments:
Communications Comments:

Submitted by:

M. Antunes, CPA Financial Planning Manager

Approved for inclusion: J. Sass, CA, CPA Director of Financial Services

Attachment:

1: 2023 Financial Plan – Final Budget Volume
2. 2023-2027 Five-Year Financial Plan
3: 2023 Financial Plan Presentation

FINANCIAL SUMMARIES

The 2023 Final Budget Volume includes requests that are emergent, required by legislation or have been directed by City Council. This volume is consolidated with the first two volumes, 2023 Preliminary Volume and the 2023 Carryover Volume, to create the 2023 Financial Plan and the 2023-2027 Five-Year Financial Plan.

The 2023 Financial Plan results in a Final Tax Demand of $176.6M. This represents an increase of $1.5M relative to the 2023 Preliminary Financial Plan, and an increase of $1.5M of taxation revenue from new construction.

The impact to the average property owner is 3.78 per cent.

FINAL BUDGET SUMMARIES

Analysis of tax demand ($ thousands)

The 2022 final tax demand was $167.1M and had a 3.94 per cent net property owner impact. The final 2023 gross department operating expenditures have increased by 2.40 per cent over 2022 and net department revenues by decreased by 2.19 per cent. The net general debt decreased by 32.41 per cent while capital expenditures from general taxation increased by 10.51 per cent and general revenue increased by 28.45 per cent for a total gross tax demand increase of $9.5M.

	2022	2023	Change	% change
Gross departmental operating expenditures	298,253	305,416	7,163	2.40%
Net departmental revenue	(136,935)	(133,942)	2,993	(2.19)%
Net departmental operating expenditure	**161,318**	**171,474**	**10,156**	**6.30%**
Net general debt	4,305	5,701	1,395	32.41%
Capital expenditures from general taxation	13,693	15,132	1,439	10.51%
General revenue	(12,209)	(15,683)	(3,473)	28.45%
Gross tax demand	**167,107**	**176,624**	**9,517**	**5.70%**
Less estimated new construction revenue	(3,160)	(3,200)		
Net property owner impact	**3.94%**	**3.78%**		**(0.16%)**

Note: Totals may not add due to rounding

General Fund tax demand ($ thousands)

The tax demand established at Preliminary Budget was $175.1M. The estimated new construction revenue was $1.7M, based on BC Assessment preliminary roll information, resulting in a 3.80 per cent net property owner impact.

Final Budget requests for net general fund operating and capital expenditures of $1.5M have held the total tax demand to $176.6M. Final new construction revenues, based on the revised assessment roll, increased by $1.5M to $3.2M, reducing the net property owner impact to 3.78 per cent.

Preliminary Budget Tax Demand			175,126
Final Budget Submissions			
General Revenues	(397)		
Operating Requests	765	368	
Capital Project Requests		1,130	
Total Final Budget Additions			1,498
Final Gross Tax Demand			**176,624**
Less new construction revenue			(3,200)
Final Net Tax Demand			**173,424**
Net Property Owner Impact			
Preliminary Budget		*3.80%*	
Financial Plan - Final Budget			**3.78%**

Note: Totals may not add due to rounding

Airport and Utility Funds – Final Budget ($ thousands)

Final Budget requests for the Water utility totals $300k funded from water reserves.

Final Budget Submissions			
Revenue	0		
Operating Requests	0	0	
Capital Project Requests		300	
Total Final Budget Additions			**300**

Note: Totals may not add due to rounding

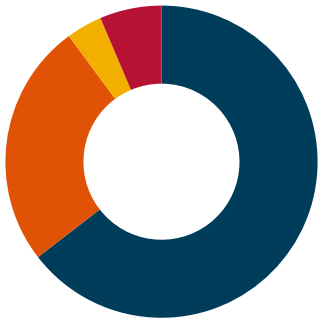
Analysis of total revenues

The total revenue budget is $780.2M with $412.9M from operating sources and $367.2M from capital sources.

The tables below summarize the total operating and capital revenue by fund, including the prior year's carryover amounts, and the same revenue information by revenue source.

Revenues by Fund ($ thousands)

	Operating	Capital
General	319,618	186,422
Airport	56,891	139,065
Water	18,204	10,501
Wastewater	18,250	31,220
	412,963	367,208
Total		**780,171**

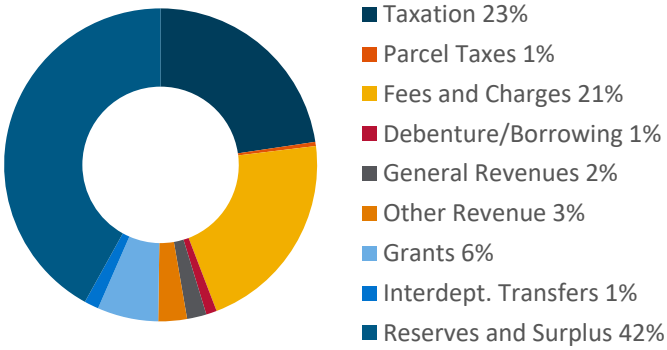


Total $780.2M

Note: Totals may not add due to rounding

Revenues by Type ($ thousands)

Taxation	176,624
Parcel Taxes	3,434
Fees and Charges	164,593
Debenture/Borrowing	8,507
General Revenues	15,683
Other Revenue	23,179
Grants	49,131
Interdept. Transfers	11,573
Reserves and Surplus	327,448
Total	**780,171**



Total $780.2M

Note: Totals may not add due to rounding

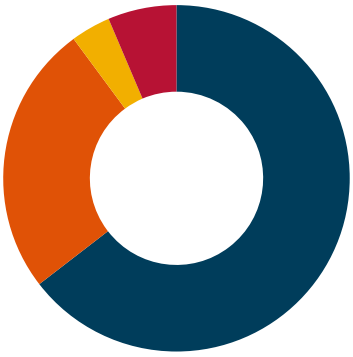
Analysis of total expenditures

The total expenditure budget requirement is $780.2M with $412.9M for operating needs and $367.2M for the 2023 capital program.

The tables below summarize the total operating and capital expenditures by fund, including the prior year's carryover amounts, and the same total operating and capital expenditure information by expenditure type.

Expenditures by Fund ($ thousands)

	Operating	Capital
General	319,618	186,422
Airport	56,891	139,065
Water	18,204	10,501
Wastewater	18,250	31,220
	412,963	367,208
Total		**780,171**

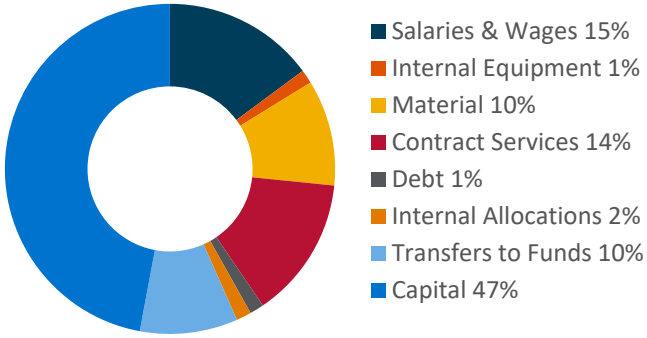


Total $780.2M

Note: Totals may not add due to rounding

Expenditures by Type ($ thousands)

Salaries & Wages	116,113
Internal Equipment	10,539
Material	80,930
Contract Services	108,344
Debt	10,899
Internal Allocations	11,403
Transfer to Funds	74,734
Capital	367,208
Total	**780,171**



Total $780.2M

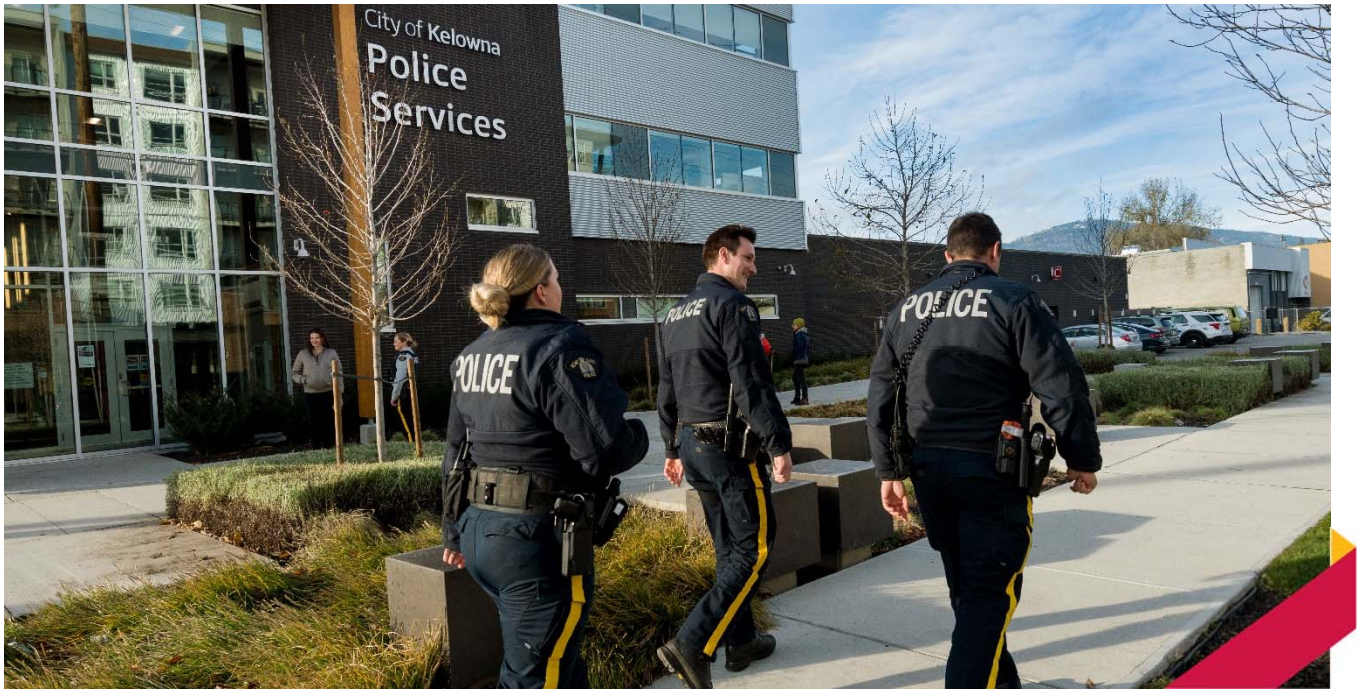
Note: Totals may not add due to rounding

Use of tax dollar by service area

The table below highlights the cost by service area and the resulting total municipal taxes for the average residential property in Kelowna for 2023. Note the municipal portion of taxes does not include amounts collected on behalf of other taxing authorities or applicable business improvement areas such as: Regional District of Central Okanagan, BC Assessment, Okanagan Regional Library, Minister of Finance – School Tax, Downtown Kelowna Business Improvement Area or Uptown Rutland Business Improvement Area. The average assessed value of a residential property is $1,009,350 in 2023, as obtained from BC Assessment. The service area with the highest cost is Community Safety, including RCMP, at 34 per cent, followed by the Parks Services at 14 per cent and Fire Department at 13 per cent.

Service area	$ Cost	2023 %	2022 %
Community Safety	803.11	34	35
Fire Department	322.14	13	13
Infrastructure			
Street Lights	28.47	1	1
Parks Services	331.32	14	13
Transportation Services	229.03	10	11
Utility Services	55.51	2	2
Planning & Development	237.83	10	10
Active Living & Culture Services	113.14	5	5
Regional Programs	10.76	1	1
Public Transit	111.91	5	4
Debt	80.36	3	3
Grants or transfers to external organizations/individuals	49.21	2	2
Total Municipal portion of taxes	**$ 2,372.80**	**100%**	**100%**

Based on the 2023 average residential property assessed property value of $1,009,350
Note: Totals may not add due to rounding



Ongoing budget impacts

Below is a projection of the next five years net property owner impacts using the best information available at the time of preparation for the Final Budget volume. As with any planning exercise, the level of certainty and detail is most appropriately found in the current year. For the years after 2023, budgets have been adjusted for current one-time projects, changes in operating budgets from previously approved requests, new capital projects included in the Council endorsed 10-Year Capital Plan, 2022-2031 (10YCP), growth and/or inflationary rates, and other key assumptions. Although this forward looking information is based on what is believed to be reasonable assumptions, there can be no assurance that this information will prove to be accurate as actual results and future events could differ materially from the anticipated information contained in this forecast.

Specific assumptions in the preparation of the years 2024-2027 included in the forecasted increases below:

- Growth rates of 1.59 per cent for 2024 to 2026, 1.47 per cent in 2027.
- Inflation rates of 2 per cent for most operating expenses and certain revenues, rate increase to 4 per cent in 2024 for materials expense.
- Debt impacts have been split over the expected construction years to match required cash flow and to spread the debt repayment impacts. Included in the plan with significant impacts, are the Parkinson Recreation Centre and the Capital New Centre – Expansion projects along with anticipated alternate funding sources.

Additional details on all assumptions are provided in the Five-Year Financial Plan (2023-2027).

	2023	2024	2025	2026	2027
General revenues	(15,683)	(16,023)	(16,371)	(16,735)	(17,089)
Net operating budget	177,175	188,047	199,214	211,274	222,421
Pay-as-you-go capital	15,132	16,255	17,453	18,727	19,981
Taxation demand	**176,624**	**188,279**	**200,296**	**213,266**	**225,313**
New construction tax revenue	(3,200)	(2,808)	(2,994)	(3,185)	(3,135)
Net property owner impact	**3.78%**	**5.01%**	**4.79%**	**4.89%**	**4.18%**

Note: Totals may not add due to rounding.

Financial Plan 2023 - 2027

The table below outlines the City's Five-Year forecast for all funds revenues and expenditures for 2023-2027. The years 2028-2030 are included in summary to match the term of the 20-Year Servicing Plan. For detailed divisional information see the Five-Year Financial Plan section of the 2023 Financial Plan.

	2023	2024	2025	2026	2027	2028-2030
Revenue						
Property Value Tax	176,624,339	188,279,055	200,295,838	213,266,188	225,313,048	723,943,923
Library Requisition	7,325,200	7,471,704	7,621,138	7,773,561	7,929,032	24,751,330
Parcel Taxes	3,433,673	3,386,926	3,226,092	2,878,729	2,643,767	7,706,257
Fees and Charges	166,752,954	168,998,093	176,296,845	181,604,696	185,477,990	607,768,371
Borrowing Proceeds	8,507,400	161,039,504	50,989,600	0	0	6,321,200
Other Sources	90,079,744	64,924,162	68,236,877	65,808,081	64,104,429	192,860,588
	452,723,310	594,099,445	506,666,391	471,331,255	485,468,266	1,563,351,669
Transfer between Funds						
Reserve Funds	2,399,489	1,803,987	4,018,987	5,018,987	5,018,987	4,271,961
DCC Funds	55,191,710	27,879,895	45,071,243	42,110,785	72,931,463	131,287,135
Surplus/Reserve Accounts	269,856,570	73,537,991	74,663,418	52,310,615	67,176,349	243,984,608
	327,447,769	103,221,873	123,753,649	99,440,388	145,126,799	379,543,705
Total Revenues	780,171,079	697,321,318	630,420,039	570,771,643	630,595,065	1,942,895,374
Expenditures						
Municipal Debt						
Debt Interest	3,980,837	5,854,736	10,057,004	13,579,814	15,783,808	46,825,315
Debt Principal	6,918,584	7,140,895	9,295,237	13,569,554	14,561,097	43,009,316
Capital Expenditures	367,208,100	288,733,676	204,324,905	129,728,128	173,098,283	427,984,615
Other Municipal Purposes						
General Government	38,935,773	44,982,463	47,990,399	51,232,650	54,614,371	185,472,621
Planning, Development & Building Services	35,969,865	29,502,083	29,279,911	30,240,946	31,205,486	99,725,484
Community Services	102,941,048	105,058,206	108,811,337	112,228,174	115,657,991	368,692,809
Protective Services	94,492,441	88,067,171	91,149,022	94,369,042	97,594,381	313,263,910
Utilities	27,894,607	26,681,298	27,473,602	28,278,225	28,981,397	92,258,679
Airport	22,666,780	23,045,145	24,379,339	26,662,772	27,403,596	86,108,813
	701,008,035	619,065,673	552,760,756	499,889,305	558,900,411	1,663,341,561
Transfers between Funds						
Reserve Funds	31,694,307	31,556,581	32,324,994	32,376,236	32,439,085	97,164,211
DCC Funds	0	0	0	0	0	0
Surplus/Reserve Accounts	47,468,737	46,699,064	45,334,289	38,506,102	39,255,570	182,389,601
	79,163,044	78,255,645	77,659,283	70,882,338	71,694,655	279,553,812
Total Expenditures	780,171,079	697,321,318	630,420,039	570,771,643	630,595,065	1,942,895,374

Note: Totals may not add due to rounding.

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OPERATING BUDGET

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2023 Operating Requests
Final Budget
Summary - General Fund

Page	Description	Cost	Reserve	Borrow	Grant/Other	Revenue	Utility	Taxation	Cat
City Administration									
New									
549	Council Initiatives	500,000	0	0	0	0	0	(500,000)	OG
	Total New	500,000	0	0	0	0	0	(500,000)	
	Division Priority 1 Total	500,000	0	0	0	0	0	(500,000)	
Infrastructure Division									
Growth									
550	** Downtown On Call and Clean Team Support Increase*	24,000	0	0	0	0	0	(24,000)	OG
	Total Growth	24,000	0	0	0	0	0	(24,000)	
	Division Priority 1 Total	24,000	0	0	0	0	0	(24,000)	
Corporate & Protective Services Division									
Corporate Services									
Maintain									
549	Insurance Premiums - Inflationary Increase	161,000	0	0	0	0	0	(161,000)	OG
	Total Maintain	161,000	0	0	0	0	0	(161,000)	
Growth									
550	Downtown On Call and Clean Team Support Increase	30,000	0	0	0	0	0	(30,000)	OG
550	Extreme Weather Response Program Funding	30,000	(30,000)	0	0	0	0	0	OG
551	Security Services Enhancement - Additional Guard	50,000	0	0	0	0	0	(50,000)	OG
	Total Growth	110,000	(30,000)	0	0	0	0	(80,000)	
	Division Priority 1 Total	271,000	(30,000)	0	0	0	0	(241,000)	
Financial Services Division									
Debt & Other									
Maintain									
551	Transmission of Taxes - BIA's and Other Governments	133,554,000	0	0	0	(133,554,000)	0	0	OT
	Total Maintain	133,554,000	0	0	0	(133,554,000)	0	0	

Page	Description	Cost	Reserve	Borrow	Grant/Other	Revenue	Utility	Taxation	Cat
	Division Priority 1 Total	133,554,000	0	0	0	(133,554,000)	0	0	
	Financial Services Division								
	Revenue & Fees								
	Maintain								
552	FortisBC Operating Fee	0	0	0	0	(396,800)	0	396,800	OG
	Total Maintain	0	0	0	0	(396,800)	0	396,800	
	Division Priority 1 Total	0	0	0	0	(396,800)	0	396,800	
	Total Priority 1 Operating	134,349,000	(30,000)	0	0	(133,950,800)	0	(368,200)	

2023 Operating Request Details

Division:	City Manager	Priority: 1	New
Department:	Council		ON-GOING
Title:	Council Initiatives		FINAL

Justification:

Kelowna City Council is committed to working closely with residents, community partners and other levels of government to bring positive change. Council priorities and results identify where residents and City Council want to make a difference. Budget is requested for City Council to provide funding to promote and finance various initiatives that will contribute to this change.

Strategic Direction: Other - Council Resolution

	Cost	Reserve	Borrow	Grant	Other	Revenue	Utility	Taxation
2023	500,000	0	0	0	0	0	0	(500,000)
2024	500,000	0	0	0	0	0	0	(500,000)
2025	500,000	0	0	0	0	0	0	(500,000)

Division:	Corporate & Protective Services	Priority: 1	Maintain
Department:	Risk Management		ON-GOING
Title:	Insurance Premiums - Inflationary Increase		FINAL

Justification:

Budget is requested to cover inflationary increases in insurance premiums. Inflation on insurance premium rates in 2023 has been significant worldwide. Property insurance costs in particular increased as a result of higher building replacement costs due to inflation of materials and labour. The City of Kelowna insures $1.1B of built infrastructure with coverage including liability, property, cybercrime and environmental impairment.

2023 Base budget: $1.55M

Expected Completion: Dec 2023

Strategic Direction: Financial management - Cost to deliver services is quantified

	Cost	Reserve	Borrow	Grant	Other	Revenue	Utility	Taxation
2023	161,000	0	0	0	0	0	0	(161,000)
2024	161,000	0	0	0	0	0	0	(161,000)
2025	161,000	0	0	0	0	0	0	(161,000)

2023 Operating Request Details

Division:	Corporate & Protective Services	Priority: 1	Growth
Department:	Risk Management		ON-GOING
Title:	Downtown On Call and Clean Team Support Increase		FINAL

Justification:

The City of Kelowna works in collaboration with the Downtown Kelowna Business Association to maintain a safe and inviting environment in the downtown core. Since 2019, the City has financially supported the Downtown On Call (DOC) and Downtown Clean Team (DCT). Budget is requested to increase the support for these important teams to allow them to address an increasing demand for service.

2023 Base budget: $106k

Strategic Direction: Community Safety - Residents feel safe

	Cost	Reserve	Borrow	Grant	Other	Revenue	Utility	Taxation
2023	54,000	0	0	0	0	0	0	(54,000)
2024	54,000	0	0	0	0	0	0	(54,000)
2025	54,000	0	0	0	0	0	0	(54,000)

Division:	Corporate & Protective Services	Priority: 1	Growth
Department:	Risk Management		ON-GOING
Title:	Extreme Weather Response Program Funding		FINAL

Justification:

Budget is requested for the City of Kelowna to support vulnerable people throughout the community during extreme hot and cold weather events, for which there is no formal program or funding currently in place. These activities are separate from actions taken by the Regional Emergency Program. In 2022, the Province formally asked all local governments in BC to work with community partners to have a community plan for heat domes and freezing cold conditions. Staff will monitor for grants and other funding sources as they become available to offset or supplement this funding.

Strategic Direction: Community Safety - Residents feel safe

	Cost	Reserve	Borrow	Grant	Other	Revenue	Utility	Taxation
2023	30,000	(30,000)	0	0	0	0	0	0
2024	30,000	0	0	0	0	0	0	(30,000)
2025	30,000	0	0	0	0	0	0	(30,000)

2023 Operating Request Details

Division:	Corporate & Protective Services	Priority: 1	Growth
Department:	Risk Management		ON-GOING
Title:	Security Services Enhancement - Additional Guard		FINAL

Justification:

Budget is requested for an additional seasonal security guard to support downtown from April through September. More support is needed to address growing security concerns during the early morning hours. Additional security presence at these times will reduce vandalism and misuse of washrooms amenities as well as improve asset protection.

2023 Base budget: $1.02M

Strategic Direction: Other - Supports Base Business

	Cost	Reserve	Borrow	Grant	Other	Revenue	Utility	Taxation
2023	50,000	0	0	0	0	0	0	(50,000)
2024	50,000	0	0	0	0	0	0	(50,000)
2025	50,000	0	0	0	0	0	0	(50,000)

Division:	Financial Services	Priority: 1	Maintain
Department:	Financial Services		ONE-TIME
Title:	Transmission of Taxes - BIA's and Other Governments		FINAL

Justification:

To establish the receipt and disbursement of taxes to Business Improvement Areas (BIA) and other governments: Regional District of Central Okanagan (RDCO) ($14,816,900); RDCO SIR Land Levy ($763,200); RDCO SIR Parcel Tax ($275,000); BC Assessment Authority ($2,759,700); School Tax ($87,498,800); Additional School Tax ($4,074,800); Kelowna Downtown BIA ($1,149,000); Uptown Rutland BIA ($222,500); Regional Hospital ($14,668,900); and Okanagan Regional Library ($7,325,200). The total amount to be collected for all other taxing authorities is $133,554,000.

Strategic Direction: Financial management - Cost to deliver services is quantified

	Cost	Reserve	Borrow	Grant	Other	Revenue	Utility	Taxation
2023	133,554,000	0	0	0	0	(133,554,000)	0	0

2023 Operating Request Details

Division:	Financial Services	Priority: 1	Maintain
Department:	Financial Services		ON-GOING
Title:	FortisBC Operating Fee		FINAL

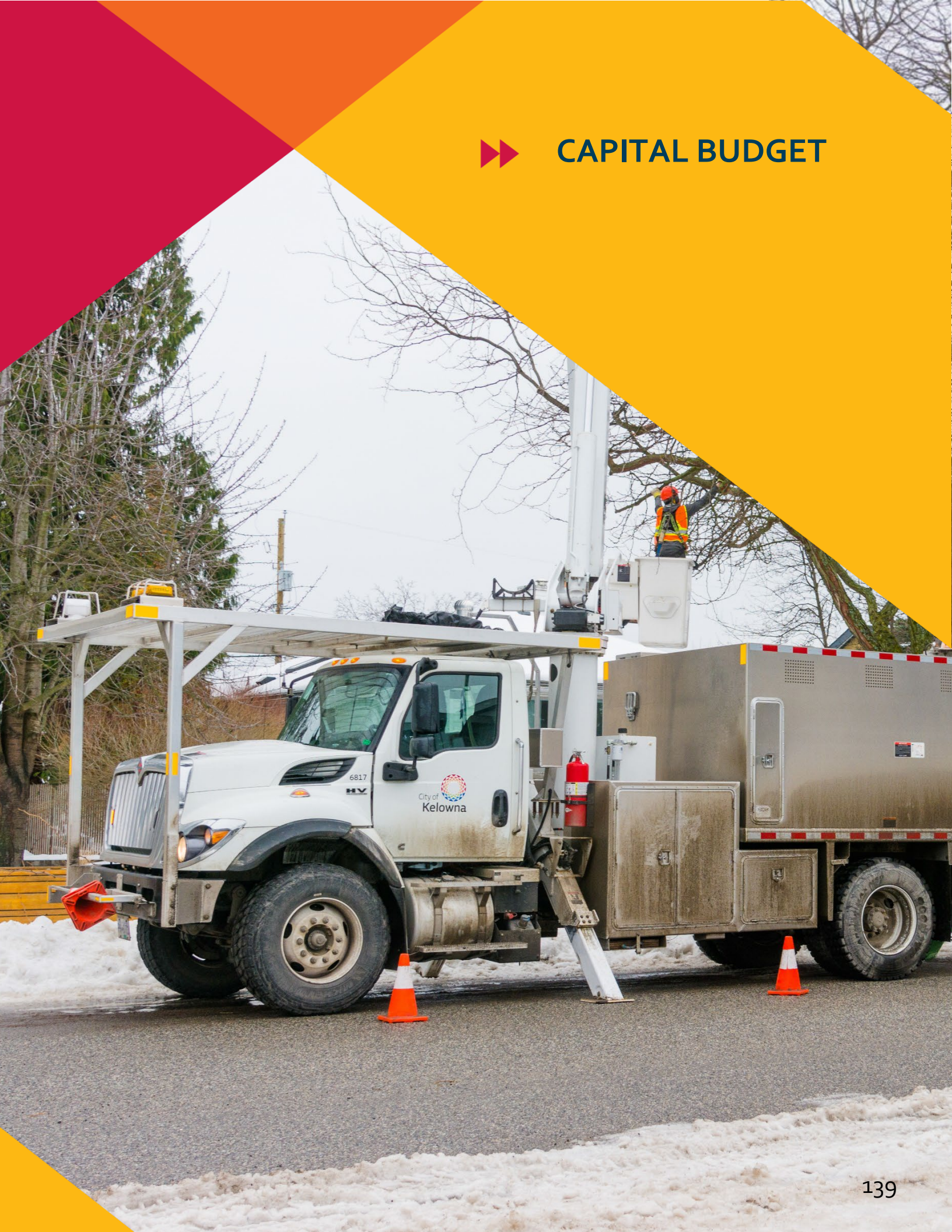
Justification:

This request is to adjust the franchise fee revenue due from FortisBC up to $2,157,365 from the 2023 Preliminary budget amount of $1,760,540. The fee is based on 3 per cent of the gross revenue for the provision and distribution of all gas consumed within the City of Kelowna during the 2022 calendar year.

Strategic Direction: Financial management - Non-tax revenues are increasing

	Cost	Reserve	Borrow	Grant	Other	Revenue	Utility	Taxation
2023	0	0	0	0	0	(396,800)	0	396,800
2024	0	0	0	0	0	(396,800)	0	396,800
2025	0	0	0	0	0	(396,800)	0	396,800

CAPITAL BUDGET



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2023 Capital Requests
Final Budget
Summary - General Fund

Page	Type	Description	Asset Cost	Reserve	Borrow	Grant	Other	Utility	Taxation
Building Capital - Priority 1									
556	Renew	H20 Facility Air Handling Renewal	2,500,000	(1,500,000)	0	0	0	0	(1,000,000)
		B1 - Parks and Recreation Buildings	2,500,000	(1,500,000)	0	0	0	0	(1,000,000)
556	Renew	General Building Infrastructure Renewal	1,050,000	(1,050,000)	0	0	0	0	0
		B2 - Community and Cultural Buildings	1,050,000	(1,050,000)	0	0	0	0	0
557	Renew	City Hall - Level 1 Meeting Room Suite	135,000	(135,000)	0	0	0	0	0
		B3 - Civic/Protective Service Buildings	135,000	(135,000)	0	0	0	0	0
557	Renew	City Yards - Female Changeroom Upgrades	130,000	0	0	0	0	0	(130,000)
		B4 - Transportation and Public Works Buildings	130,000	0	0	0	0	0	(130,000)
		Cost Center Totals	3,815,000	(2,685,000)	0	0	0	0	(1,130,000)
Parks Capital - Priority 1									
558	Renew	City Park - Rose Garden Improvements	220,000	(220,000)	0	0	0	0	0
		P6 - City-wide Park Development	220,000	(220,000)	0	0	0	0	0
558	Growth	Mission Recreation Park - Modular park washroom unit	162,000	(162,000)	0	0	0	0	0
		P8 - Renewal, Rehabilitation & Infra	162,000	(162,000)	0	0	0	0	0
		Cost Center Totals	382,000	(382,000)	0	0	0	0	0
		Grand Total	4,197,000	(3,067,000)	0	0	0	0	(1,130,000)

2023 Capital Request Details

Department: Capital Projects
Cost Center: Building Capital
Priority: 1
10 Yr Cap Plan Ref: Not included B1
Renew

Title: H20 Facility Air Handling Renewal
FINAL

Justification:

Air Handling units at the H2O Adventure & Fitness Centre are approaching the end of their useful life. Immediate service work and replacement is recommended to ensure building operations are not impacted. In consideration of supply chain issues, final work is anticipated into Q2, 2024.

Expected Completion: Dec 2024

Strategic Direction: Other - Extraordinary or Unforeseen Obligation

Operating Impact: There are no operation and maintenance budget impacts associated with this request

Asset Cost	Reserve	Borrow	Fed/Prov	Dev/Com	Utility	Taxation
2,500,000	(1,500,000)	0	0	0	0	(1,000,000)

Department: Capital Projects
Cost Center: Building Capital
Priority: 1
10 Yr Cap Plan Ref: Not included B2
Renew

Title: General Building Infrastructure Renewal
FINAL

Justification:

Budget is requested for general building infrastructure renewal that includes additional budget for the City Hall mechanical upgrade due to equipment cost escalations, and for the modernization of the elevator at the Parkinson Activity Centre. The elevator has had recent frequent maintenance concerns and outages. Contractor investigation identified critical parts are now obsolete requiring modernization to ensure accessibility.

Expected Completion: Dec 2023

Strategic Direction: Other - Extraordinary or Unforeseen Obligation

Operating Impact: There are no operation and maintenance budget impacts associated with this request

Asset Cost	Reserve	Borrow	Fed/Prov	Dev/Com	Utility	Taxation
1,050,000	(1,050,000)	0	0	0	0	0

2023 Capital Request Details

Department: Capital Projects
Cost Center: Building Capital
Priority: 1 Renew
10 Yr Cap Plan Ref: 2021 B3 - $4.685M

Title: City Hall - Level 1 Meeting Room Suite FINAL

Justification:

The meeting room suite of 4,200sqft on Level 1 of City Hall is complete and will be open shortly for use for City business as well as available for community bookings after hours. In the spirit of reconciliation and recognizing the living history of our region, the rooms are proposed to be given First Nations names, with artwork and decor to honour these names. The name na'?k'?ulam?n generally translates to 'the things that we do'.

The existing capital project is complete, and due to inflationary costs experienced throughout this project, there is no budget remaining for such enhancements. Budget is therefore requested for artwork, decor and specific furniture to create a most meaningful space in the meeting room suite.

Expected Completion: Dec 2023

Strategic Direction: Social & inclusive - Inclusivity and diversity are increasing

Operating Impact: There are no operation and maintenance budget impacts associated with this request

Asset Cost	Reserve	Borrow	Fed/Prov	Dev/Com	Utility	Taxation
135,000	(135,000)	0	0	0	0	0

Department: Capital Projects
Cost Center: Building Capital
Priority: 1 Renew
10 Yr Cap Plan Ref: Not included B4

Title: City Yards - Female Changeroom Upgrades FINAL

Justification:

Budget is requested to accommodate the increase of female staff for the Outdoor Operations team at the City Yards facility. The female changeroom facilities have become unsuitably overcrowded for the increased number of female staff. A remodeling of the changeroom and washroom is recommended to increase the area and allow for adequate room for the additional female staff.

Expected Completion: Dec 2023

Strategic Direction: People - Ability to attract, select & retain talent

Operating Impact: There are no operation and maintenance budget impacts associated with this request

Asset Cost	Reserve	Borrow	Fed/Prov	Dev/Com	Utility	Taxation
130,000	0	0	0	0	0	(130,000)

2023 Capital Request Details

Department: Capital Projects
Cost Center: Parks Capital
Priority: 1
10 Yr Cap Plan Ref: Not included P6
Renew

Title: City Park - Rose Garden Improvements
FINAL

Justification:

Budget is requested for a cross-divisional operational initiative to modify existing amenities, with a focus on safety and operational improvements at City Park. Through the improvement of sightlines, and the introduction of new activities to encourage more park users onto the east side of the park, it is expected many of the social issues that occur will be moved from this area.

Expected Completion: Dec 2023

Strategic Direction: Community Safety - Residents feel safe

Operating Impact: There are no operation and maintenance budget impacts associated with this request

Asset Cost	Reserve	Borrow	Fed/Prov	Dev/Com	Utility	Taxation
220,000	(220,000)	0	0	0	0	0

Department: Capital Projects
Cost Center: Parks Capital
Priority: 1
10 Yr Cap Plan Ref: Not included P8
Growth

Title: Mission Recreation Park - Modular park washroom unit
FINAL

Justification:

Budget is requested to purchase, transport and install a new, unused multi-stall parks washroom unit. The unit is proposed to be installed first at Mission Rec Park (MRP) to service the high demand in the southern half of the site. When other permanent washrooms become available at MRP, the unit will be relocated to another high demand location. Cost savings are expected to be realized through the reduction of renting and maintaining of the blue portable toilets.

Expected Completion: Dec 2023

Strategic Direction: Financial management - Cost to deliver services is quantified

Operating Impact: There are no operation and maintenance budget impacts associated with this request

Asset Cost	Reserve	Borrow	Fed/Prov	Dev/Com	Utility	Taxation
162,000	(162,000)	0	0	0	0	0

2023 Capital Requests
Final Budget
Summary - Water Fund

Page	Type	Description	Asset Cost	Reserve	Borrow	Grant	Other	Utility
Water Capital - Priority 1								
560	Growth	Osprey Ave Watermain	300,000	(300,000)	0	0	0	0
		W7 - Network and Facility Improvements	300,000	(300,000)	0	0	0	0
		Cost Center Totals	300,000	(300,000)	0	0	0	0
		Grand Total	300,000	(300,000)	0	0	0	0

2023 Capital Request Details

Department:	Capital Projects	Priority: 1	Growth
Cost Center:	Water Capital	10 Yr Cap Plan Ref: Not included W7 - $0	
Title:	Osprey Ave Watermain		FINAL

Justification:

Budget is requested to help minimize the overall service disruption to the surrounding Osprey Avenue neighbourhood. The project consists of upgrading the watermain along Osprey Avenue while the sewer project is being constructed as this neighbourhood was approved for intensification. The Water Utility will fund 50 per cent of the project to reflect the advancing of the renewal project, while the remaining 50 percent will be recovered, from development, through future latecomer fees.

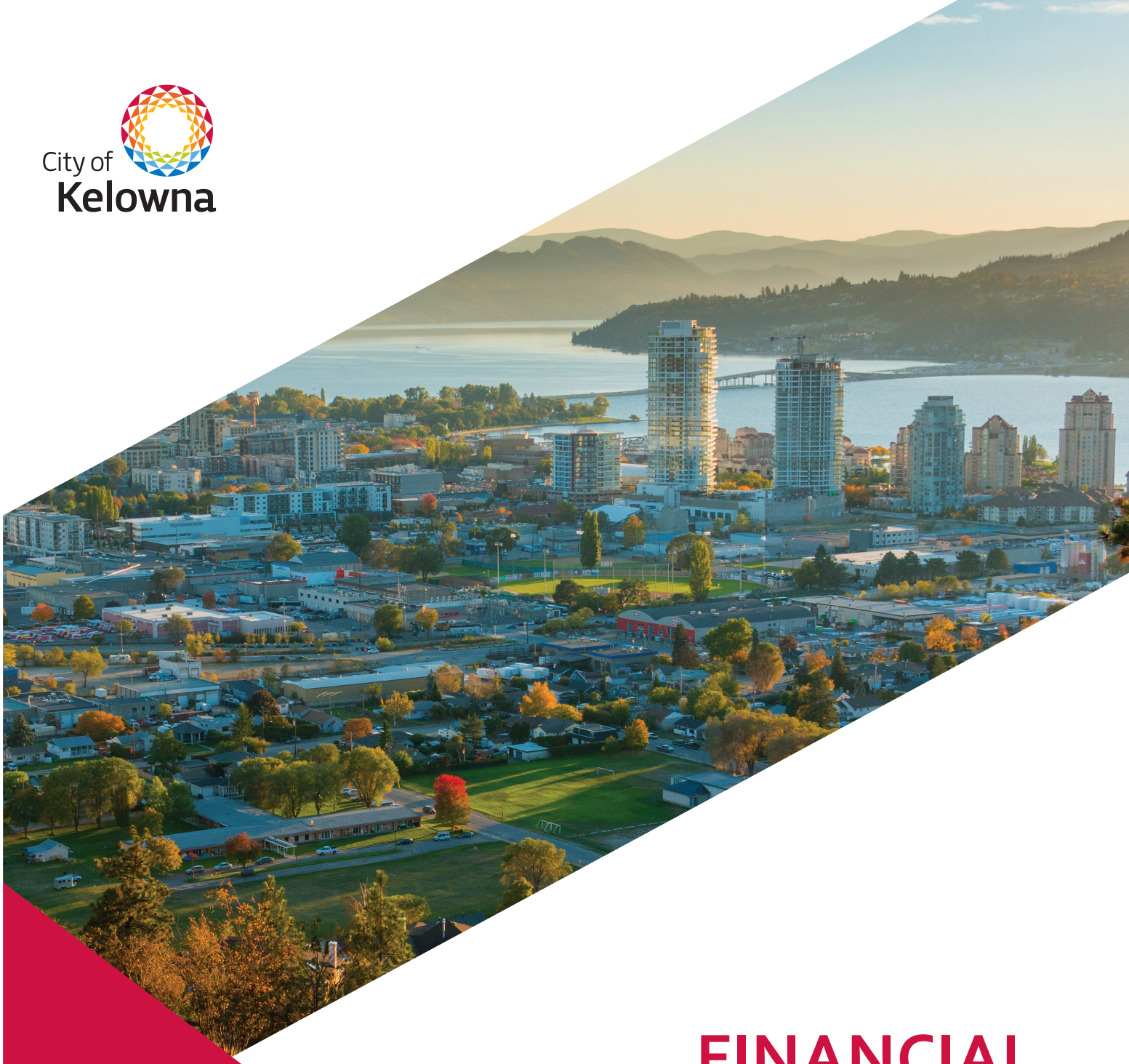
Expected Completion: Dec 2023

Strategic Direction: Economic resiliency - City policies are enabling investment

Operating Impact: There are no operation and maintenance budget impacts associated with this request

Asset Cost	Reserve	Borrow	Fed/Prov	Dev/Com	Utility
300,000	(300,000)	0	0	0	0

City of Kelowna



FINANCIAL PLAN

Kelowna, BC Canada
Five-Year Financial Plan
2023-2027

2023

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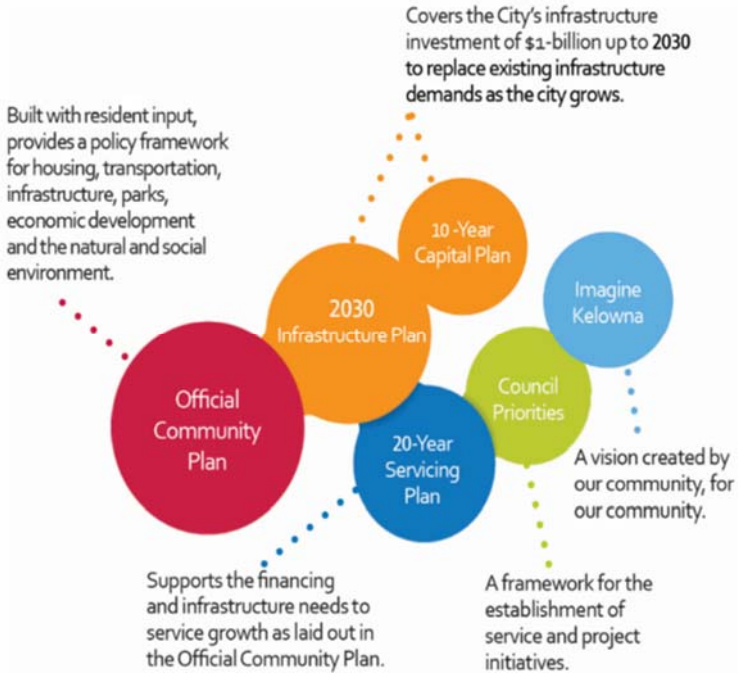
FINANCIAL PLAN

The City of Kelowna has developed a comprehensive Financial Plan providing a five-year summary of general revenues, operating expenditures, and capital expenditures to help guide the City throughout the next five years. The format of the plan keeps the General Fund separate from the Utility Funds to clearly identify taxation requirements for the five-year period.

Over the past year there has been a significant economic change that has led to increased inflation, interest rate pressures, supply chain disruptions and labour shortages which have impacted the City of Kelowna's Financial Plan. Strategic decision making is the key to strong financial management to govern economic challenges and will require attention to reposition priorities, seek out cost saving opportunities and find new ways to generate revenue. The priority is to continue to deliver on our promise to the community and organizations by keeping the tax rate low, addressing social issues, supporting affordable housing and improving transportation programs.

The Financial Plan attempts to provide a 'snapshot' of the future using current standards and service levels. The City is committed to delivering programs, services and infrastructure in a manner that respects the community vision identified through Imagine Kelowna. The community input received through Imagine Kelowna, the availability of funding from other sources (Federal, Provincial, and Community), the Official Community Plan, 20 Year Servicing Plan, the 2030 Infrastructure Plan and the 10-Year Capital Plan, all affect the programs included in the future years of the plan. The Council endorsed 10-Year Capital Plan, 2022-2031, and the 2030 Infrastructure Plan, have provided a guideline for future capital through to 2030 in this Financial Plan. The Financial Plan is intended to provide guidance and information upon which to base current and future expenditure decisions. It will aid in the understanding of the City's financial position and financing capabilities over the next five years.



The development of the Financial Plan follows the 2023 budget process which includes:

- Preliminary Budget – approved by Council December 8, 2022
- Carryover Requests – approved by Council March 20, 2023
- Final Budget – approved by Council on April 24, 2023

Although most of this plan is devoted to the Preliminary Budget details, the changes made by Council at Preliminary, Carryover, and Final Budget, together, provide the 2023 portion of the Financial Plan.

For the years after 2023, the operating budget is adjusted for current one-time projects, approved prior year changes in operating requirements, new capital projects included in the Council endorsed 10-Year Capital Plan, growth and/or inflation factors depending on the nature of the revenue or expenditure, and other key assumptions. As with any planning exercise, the level of certainty and detail is most appropriately found in the current year. Future year assumptions are required to forecast general revenues, incremental operating expenditures to support new capital, debt servicing and ongoing departmental revenues and expenditures.

Assumptions used in the preparation of the years 2024 to 2027 in the Financial Plan projections include:

- An inflation rate of 2 per cent for most of the operating costs and for some revenues. The Bank of Canada aims to keep inflation at the 2 per cent midpoint of an inflation-control target range of 1 to 3 per cent. An inflation rate of 4 per cent was used in 2024 for materials expenses to accommodate the higher rate of cost escalation for these items.
- A growth rate of 1.59 per cent per year for 2024 to 2026 and 1.47 per cent per year for 2027 per the Official Community Plan was used for various revenues and expenditures and for incremental taxation revenue. Growth rates for the utilities are based on servicing expectations over the next five years which may include existing residential or commercial units.
- MFA amortization schedules and estimated rates are used as a basis for projected principal and interest where applicable.
- Approval to borrow for all priority one capital projects funded through debt as presented in the Council endorsed 10-Year Capital Plan, 2022-2031.
- There is no change in current service levels except as provided for in the capital program.
- Reserve funding is used for one-time operating and capital programs to reduce the requirement for increased taxation.

The Financial Plan summary can be found on page 543 and is used in the Financial Plan bylaw. The final column of the Financial Plan, years 2028 to 2030, is included at the request of the Ministry of Municipal Affairs and Housing for information to support the City of Kelowna's 20 Year Servicing Plan.

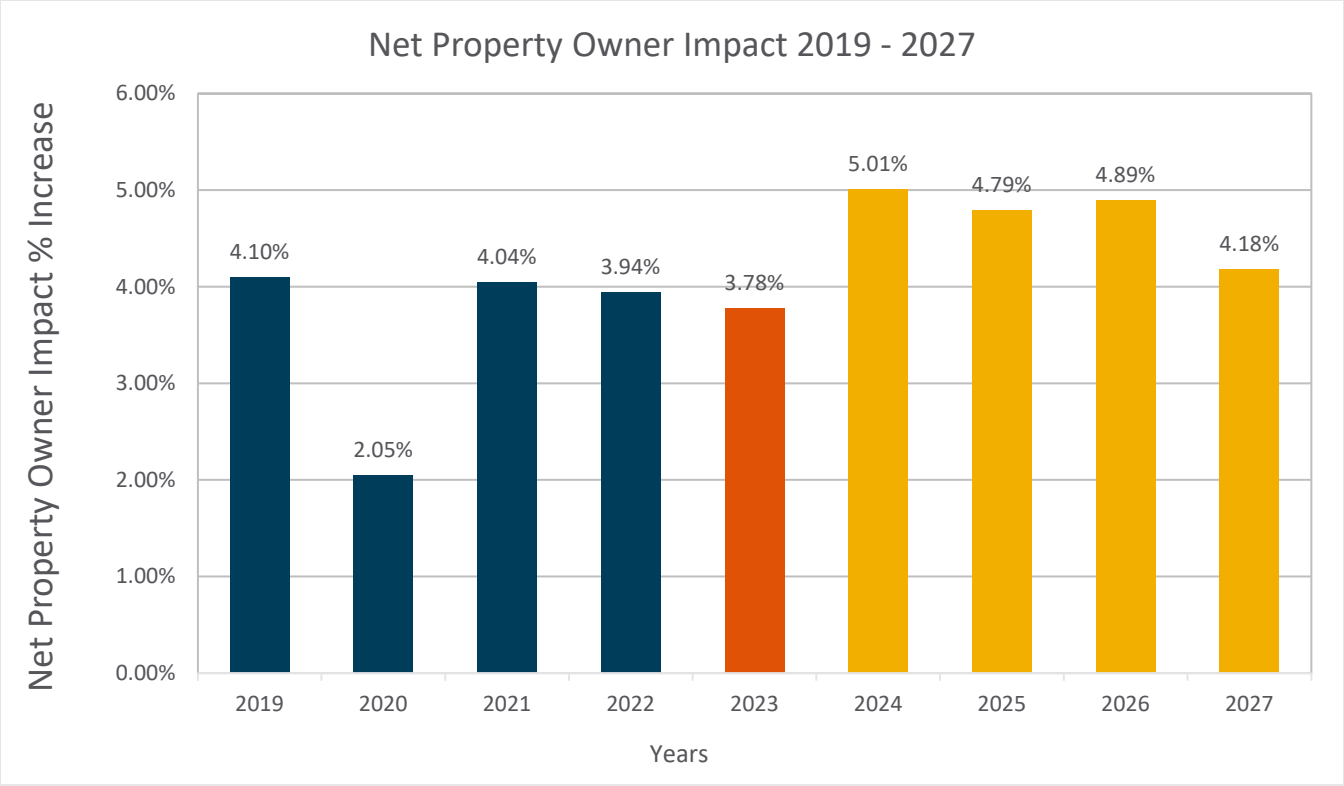
REVENUE SOURCES & TRENDS SUMMARY

The City defines financial strength and stability as "the ability to acquire and manage a portfolio of financial and physical assets that meet the current and future needs of our community." This is the goal. To guide future financial planning, the City uses the Council adopted Principles and Strategies for Financial Strength and Stability. The principles and strategies set out in this document guide decision-making within the City and help to realize this goal and, ultimately, the vision for Kelowna. While some of these strategies focus on a particular component of the financial balance – revenues and costs – they are all interrelated and work together to provide a broad framework for managing the City's overall finances.

Taxation

The City strives to ensure property taxes are sufficient to meet the community's short and long-term needs. Taxation is a major revenue source in the General Fund and accounts for 23 per cent of the 2023 Financial Plan's total revenue estimate of $780.2M.

Kelowna continues to be below the average taxes paid by property owners in British Columbia. Historical tax rate increases from 2019 to 2023 is shown in the graph below beside the projected increases for 2024 to 2027. Future year increases are estimated using projected growth, average inflation, annualization of budget requests previously approved by Council, capital projects included in the Council endorsed 10-Year Capital Plan, debt changes, and other key assumptions.



Note: Rates presented in the graph above for years 2024 to 2027 have not been approved by Council and are subject to change.

The forecasted increases for 2024 to 2027 assumes approval to borrow for all priority one capital projects funded through debt as presented in the Council endorsed 10-Year Capital Plan, 2022-2031 (10YCP). Although the 10YCP presents full project budgets in one year, debt impacts have been split over the expected construction years to match required cash flow and to spread the debt repayment impacts. Included in this plan with a significant impact are the Parkinson Recreation Centre Replacement and the Capital News Centre – Expansion projects.

Parcel Taxes

Parcel taxes are taxes levied through bylaw on the unit, frontage or area of a property that receive a specific service. The majority of the $3.4M in the 2023 Financial Plan parcel tax budget is made up of Water Utility parcel taxes and Sewer Specified Area debt recoveries.

Fees & Charges

General fund

Fees and charges are another way that the City of Kelowna raises revenues and is currently the third largest source of revenue for the general fund at 21 per cent. Fees and charges are useful because those that benefit from a service bear the cost of it. The City's objective is to ensure user fees and charges are sufficient to meet the City's needs.

General fund fees & charges revenues can be attributed to several Divisions:

- Planning & Development Services generates revenue in the form of development, subdivision, permit and inspection fees along with other service revenues. Most future fees and charges revenue in Planning and Development are estimated using growth projections alone as there is a direct relationship between development revenue and community growth.

- The Partnerships & Investments Division generates revenues in rental fees from properties owned by the City and from parking throughout the City. Future revenues have been factored by inflation alone as there is little anticipated growth in the inventory of these real estate assets.
- The Infrastructure Division budget includes Fleet Services, Parks, Public Works and Utility Services which generates the largest proportion of revenue from fees & charges. This revenue is collected through internal equipment charges, cemetery fees, landfill tipping fees and waste collection charges. Estimates of future fees and charges revenue generation are factored for inflation. This Division also includes Regional Transit. Future transit revenues are factored for growth to reflect the expected increase in service demand due to community growth.
- Active Living & Culture generates revenue from a wide variety of services including facility rentals and sales revenues along with program revenue and recreation facility use revenues. Estimates of future fees and charges revenue generation are factored for inflation and growth to recognize the expected increase in service demand due to community growth as well as recovery for program costs increases.
- Corporate & Protective Services generates revenue through Bylaw fines, Police Services such as criminal record checks, and the sale of Fire Dispatch Services to other municipalities and regional districts within the Province. Estimates of future fees and charges revenue generation for Corporate & Protective Services are factored for inflation.

Airport and Utility funds

The Kelowna International Airport (YLW) is the largest municipally owned and operated airport in Canada. YLW operates on a financially self-sufficient basis generating all funding required for services and infrastructure from several sources including airport improvement fees, landing & terminal fees, and parking fees. Passenger numbers for the Airport are expected to increase to 2.1M in 2023.

The City of Kelowna operates two utility funds: the Water Utility and the Wastewater Utility. Included in the 2023 Financial Plan is a budgeted 6 per cent rate increase for water rates, 2 per cent for the Water Quality Enhancement Fee and a 1.6 per cent rate increase for wastewater rates.

The City Wastewater Utility operates citywide. Future growth potential is limited by infrastructure cost and the availability of Provincial capital support funding. Future local service areas have been identified and the number of sewer customers and amount of revenue generated is scheduled to increase slightly over the next five years. Future revenue estimates are factored for both growth and inflation.

Borrowing Proceeds

Debt is a common tool that municipalities use to finance capital expenditures over the medium and long term. Debt is viewed as a fair way of financing a project since those who are paying the principal and interest charges are benefitting from the service. The City strives to ensure debt financing is used strategically to maintain the City's financial strength and stability.

There are no new borrowing requirements in the Financial Plan for 2023, but the City does anticipate working through the alternative approval process in 2024 to obtain approval to borrow for the replacement of the Parkinson Recreation Centre. Future projects that are planned to be funded through borrowing as indicated in the Council endorsed 10-Year Capital Plan, 2022-2031 include:

- 2024-2026: Parkinson Recreation Centre Replacement
- 2024: North Glenmore Fire Hall
- 2025-2026: Capital News Centre - Expansion
- 2025: Mission Activity Centre
- 2025: City Hall Envelope Renewal
- 2029: City Yards – New Offices

Reserves and Surplus

Reserves

Saving money for future projects and unexpected expenditures is an important planning consideration for the City of Kelowna. Reserves provide a financial mechanism for saving money to finance all or part of future infrastructure, equipment, and other requirements. Reserve funds can also provide a degree of financial stability, by reducing reliance on indebtedness to finance capital projects and acquisitions, or flexibility to leverage opportunities as they arise.

This revenue source is mainly used in the capital program for major works. A balance must be maintained between expenditure levels and reserve replenishment to ensure the sustainability of this funding source. The 2030 Infrastructure Plan relies on surplus funds being contributed to reserve on an annual basis. Reserve funding requirements vary significantly depending on the annual capital programs. In the 2023 Financial Plan, it is the largest source of revenue at 42 per cent largely due to the addition of carryover budgets which are funded through reserves.

Surplus

Surplus funds generated in the General Fund, as well as the Utility Funds of Water and Wastewater, are contributed to the accumulated surplus annually. The Council adopted Principles & Strategies for Financial Strength and Stability document includes a strategy that restricts the use of these funds to emergencies such as fires and floods.

Other sources

General revenues

General revenues include revenues not associated directly with any one City division or service. Examples of this revenue include investment interest, penalties on taxes and utility accounts, traffic fine revenue sharing and 1% payment in lieu of taxes for private utilities. These revenues are anticipated to increase by growth and/or inflation in the coming years. Over the next five years, total general revenues are anticipated to increase by approximately 2.2 per cent annually 2024 to 2026 and 2.1 per cent in 2027.

Government grants and contributions

Grants are a useful tool in a municipality's financial toolbox and can be used strategically to offset costs to taxpayers and ratepayers. However, a reliance on grants to fund capital projects and services will undermine a community's ability to attain

financial strength and stability. Grants in 2023 help to fund 6 per cent of the City's overall budget. The City's objective is to pragmatically leverage grant opportunities.

Significant grants in 2023 include the transit partnership with the Province of British Columbia which provides funding for conventional transit and custom transit costs at 26 per cent and the Investing in Canada Infrastructure program which is a federal and provincial program to help fund Kelowna's Sewer Connection area project.

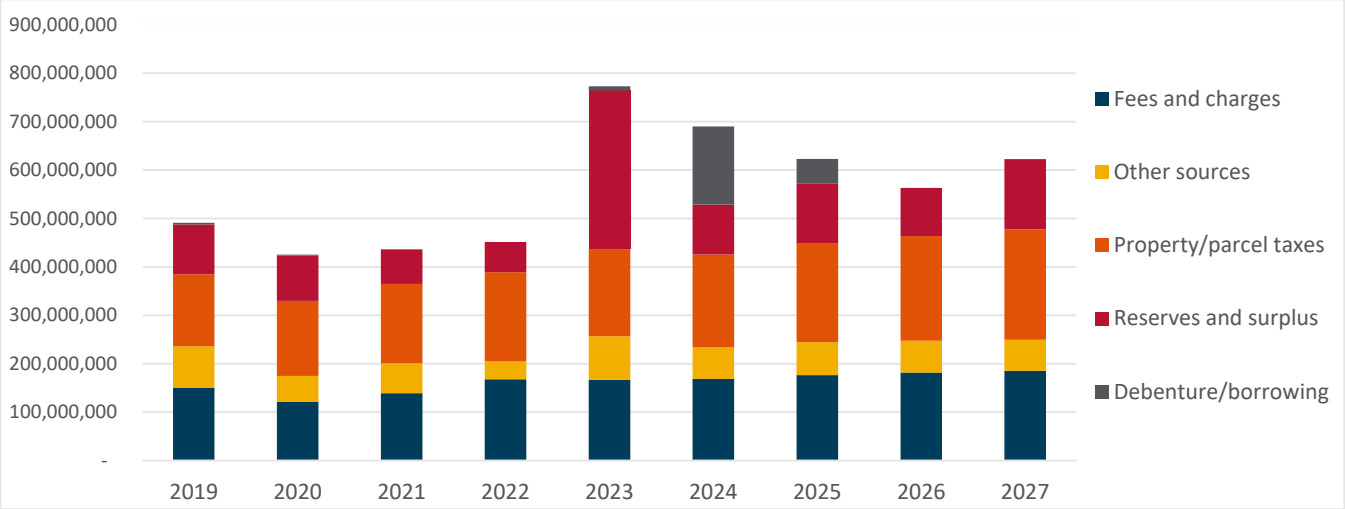
Gaming revenues are expected to increase by 27 per cent throughout 2023. This revenue is included in the RCMP budget to be applied against police costs.

The city continues to receive funding from the Canada Community-Building Fund, formerly the federal Gas Tax Fund. This fund provides predictable, long-term and stable funding for investment in infrastructure and capacity building projects to local governments in British Columbia. In 2023, the City of Kelowna expects to receive $5.7M.

The City of Kelowna will continue to apply for Federal and Provincial Grants during the year. Successful grants will be added to the 2023 Financial Plan through the budget amendment process.

Summary of revenue sources ($ thousands)

The following graph summaries the City's revenue sources by type. The years 2019 to 2022 are based on actual amounts received. Years 2023 to 2027 are forecasted values calculated using the assumptions discussed above.



Note: Reserve funding totals in the chart above are higher in 2023 due to carry-over projects.

Five-Year Financial Plan Summaries

Financial Plan 2023-2027

	2023	2024	2025	2026	2027	2028-2030
Revenue						
Property Value Tax	176,624,339	188,279,055	200,295,838	213,266,188	225,313,048	723,943,923
Library Requisition	7,325,200	7,471,704	7,621,138	7,773,561	7,929,032	24,751,330
Parcel Taxes	3,433,673	3,386,926	3,226,092	2,878,729	2,643,767	7,706,257
Fees and Charges	166,752,954	168,998,093	176,296,845	181,604,696	185,477,990	607,768,371
Borrowing Proceeds	8,507,400	161,039,504	50,989,600	0	0	6,321,200
Other Sources	90,079,744	64,924,162	68,236,877	65,808,081	64,104,429	192,860,588
	452,723,310	594,099,445	506,666,391	471,331,255	485,468,266	1,563,351,669
Transfer between Funds						
Reserve Funds	2,399,489	1,803,987	4,018,987	5,018,987	5,018,987	4,271,961
DCC Funds	55,191,710	27,879,895	45,071,243	42,110,785	72,931,463	131,287,135
Surplus/Reserve Accounts	269,856,570	73,537,991	74,663,418	52,310,615	67,176,349	243,984,608
	327,447,769	103,221,873	123,753,649	99,440,388	145,126,799	379,543,705
Total Revenues	780,171,079	697,321,318	630,420,039	570,771,643	630,595,065	1,942,895,374
Expenditures						
Municipal Debt						
Debt Interest	3,980,837	5,854,736	10,057,004	13,579,814	15,783,808	46,825,315
Debt Principal	6,918,584	7,140,895	9,295,237	13,569,554	14,561,097	43,009,316
Capital Expenditures	367,208,100	288,733,676	204,324,905	129,728,128	173,098,283	427,984,615
Other Municipal Purposes						
General Government	38,935,773	44,982,463	47,990,399	51,232,650	54,614,371	185,472,621
Planning, Development & Building Services	35,969,865	29,502,083	29,279,911	30,240,946	31,205,486	99,725,484
Community Services	102,941,048	105,058,206	108,811,337	112,228,174	115,657,991	368,692,809
Protective Services	94,492,441	88,067,171	91,149,022	94,369,042	97,594,381	313,263,910
Utilities	27,894,607	26,681,298	27,473,602	28,278,225	28,981,397	92,258,679
Airport	22,666,780	23,045,145	24,379,339	26,662,772	27,403,596	86,108,813
	701,008,035	619,065,673	552,760,756	499,889,305	558,900,411	1,663,341,561
Transfers between Funds						
Reserve Funds	31,694,307	31,556,581	32,324,994	32,376,236	32,439,085	97,164,211
DCC Funds	0	0	0	0	0	0
Surplus/Reserve Accounts	47,468,737	46,699,064	45,334,289	38,506,102	39,255,570	182,389,601
	79,163,044	78,255,645	77,659,283	70,882,338	71,694,655	279,553,812
Total Expenditures	780,171,079	697,321,318	630,420,039	570,771,643	630,595,065	1,942,895,374

Note: Totals may not add due to rounding.

General Fund Tax Impact Summary

	2023	2024	2025	2026	2027
General revenues	(15,682,529)	(16,022,621)	(16,371,392)	(16,735,455)	(17,089,412)
Net operating budget	177,175,069	188,046,676	199,214,230	211,274,643	222,421,460
Pay-as-you-go capital	15,131,800	16,255,000	17,453,000	18,727,000	19,981,000
Taxation demand	**176,624,340**	**188,279,055**	**200,295,838**	**213,266,188**	**225,313,048**
New construction tax revenue	(3,200,000)	(2,808,000)	(2,994,000)	(3,185,000)	(3,135,000)
Municipal Impact	2.78%	4.01%	3.79%	3.89%	3.18%
Public Safety Levy Impact	1.00%	1.00%	1.00%	1.00%	1.00%
Net property owner impact	**3.78%**	**5.01%**	**4.79%**	**4.89%**	**4.18%**

Note: Totals may not add due to rounding.

General Revenue

	2023	2024	2025	2026	2027
Licences					
Dog Licences	3,100	3,100	3,100	3,100	3,100
	3,100	3,100	3,100	3,100	3,100
Franchise fee					
Fortis Gas	2,157,340	2,234,789	2,315,017	2,398,126	2,481,341
	2,157,340	2,234,789	2,315,017	2,398,126	2,481,341
Interest & penalties					
Interest on Investments	7,129,261	7,242,616	7,357,774	7,474,763	7,584,642
Tax Arrears & Delinquent	195,000	198,101	201,250	204,450	207,455
Penalties on Taxes	1,500,000	1,523,850	1,548,079	1,572,693	1,595,812
Penalties Utility Accounts	100,000	101,590	103,205	104,846	106,387
Interest on Accounts Receivable	69,000	69,000	69,000	69,000	69,000
	8,993,261	9,135,157	9,279,308	9,425,752	9,563,296
Miscellaneous revenues					
Work Order Administration	40,000	41,436	42,924	44,465	46,008
Local Improvement Prepayments	24,050	24,050	24,050	24,050	24,050
Discounts Earned & Misc	137,029	141,948	147,045	158,683	170,187
Risk to Roll	(310,000)	(321,129)	(332,658)	(344,600)	(356,558)
	(108,921)	(113,695)	(118,639)	(117,402)	(116,313)
Federal contributions					
Grants in Lieu of Taxes	150,438	153,447	156,516	159,646	162,839
Provincial contributions					
Grants in Lieu of Taxes	476,169	485,692	495,406	505,314	515,420
Traffic Fine Revenue Sharing	1,550,553	1,575,207	1,600,253	1,625,697	1,649,595
Climate Action Rev Incentive	-	-	-	-	-
Certificate of Recognition Rebate	143,000	143,000	143,000	143,000	143,000
Appropriation to Reserves	(143,000)	(143,000)	(143,000)	(143,000)	(143,000)
	2,026,722	2,060,899	2,095,659	2,131,011	2,165,015
Natural Gas Utility	-	-	-	-	-
Taxes - private utilities					
1% in Lieu of Taxes	2,460,589	2,548,924	2,640,431	2,735,222	2,830,134
Total General Revenues	**15,682,529**	**16,022,621**	**16,371,392**	**16,735,455**	**17,089,412**
Property taxation	176,624,339	188,279,055	200,295,838	213,266,188	225,313,048
Total General Revenue & taxation	**192,306,868**	**204,301,676**	**216,667,230**	**230,001,643**	**242,402,460**

Note: Totals may not add due to rounding.

Operating Summary - General Fund

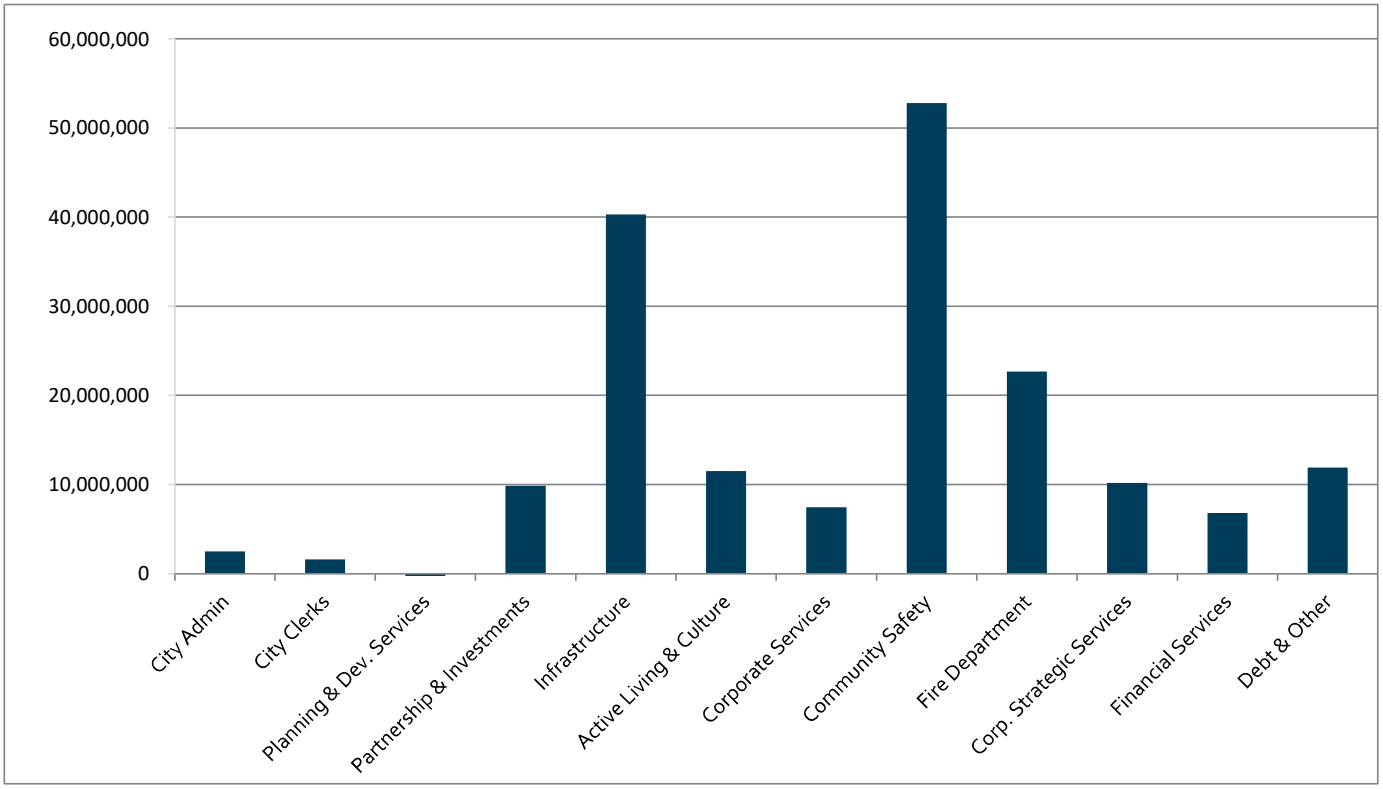
Revenues/Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Library Requisition	(7,325,200)	(7,471,704)	(7,621,138)	(7,773,561)	(7,929,032)
Parcel Tax	(142,448)	(142,448)	(142,448)	(142,448)	(142,448)
Fees and Charges	(73,415,113)	(74,915,627)	(76,340,683)	(77,864,391)	(79,416,512)
Sales of Service	(60,940,805)	(62,167,051)	(63,311,274)	(64,537,527)	(65,782,693)
Other	0	0	0	0	0
User Fees	(12,474,308)	(12,748,576)	(13,029,409)	(13,326,864)	(13,633,819)
Other Revenue	(40,704,009)	(37,681,214)	(38,236,787)	(38,017,169)	(38,716,543)
Interest	(1,910,490)	(1,948,700)	(1,987,674)	(2,027,427)	(2,067,976)
Grants	(19,561,800)	(17,129,076)	(17,420,564)	(17,715,851)	(18,000,403)
Other	0	0	0	0	0
Services to Other Governments	(8,827,427)	(8,883,140)	(9,060,114)	(9,240,615)	(9,424,506)
Interdepartment Transfer	(10,404,292)	(9,720,298)	(9,768,435)	(9,033,276)	(9,223,658)
Interfund Transfer	0	0	0	0	0
Transfers from Funds	(20,855,859)	(4,033,687)	(6,042,887)	(7,042,887)	(7,042,887)
Special (Stat Reserve) Funds	(2,399,489)	(1,803,987)	(4,018,987)	(5,018,987)	(5,018,987)
Development Cost Charges	(795,400)	(795,400)	(795,400)	(795,400)	(795,400)
Accumulated Surplus	(17,660,970)	(1,434,300)	(1,228,500)	(1,228,500)	(1,228,500)
Total Revenue	**(142,442,629)**	**(124,244,680)**	**(128,383,943)**	**(130,840,456)**	**(133,247,422)**
Expenditures					
Salaries and Wages	99,178,350	104,039,948	109,510,591	115,310,661	121,245,457
Internal Equipment	8,595,130	9,057,844	9,452,186	9,772,327	10,093,327
Material and Other	57,941,849	47,481,619	48,638,471	49,701,181	50,781,342
Contract Services	106,377,812	102,568,003	106,101,913	109,759,136	113,424,595
Debt Interest	2,838,890	4,586,506	7,841,954	10,519,185	11,688,491
Debt Principal	3,948,472	4,180,067	5,837,986	7,716,490	9,032,323
Internal Allocations	4,674,907	4,462,507	3,527,507	3,527,507	3,527,507
Interdepartment Transfer	4,674,907	4,462,507	3,527,507	3,527,507	3,527,507
Interfund Transfer	0	0	0	0	0
Transfer to Funds	36,062,288	35,914,862	36,687,565	35,808,612	35,875,839
Special (Stat Reserve) Funds	31,495,847	31,358,121	32,126,534	32,177,776	32,240,625
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	4,566,441	4,556,741	4,561,031	3,630,836	3,635,214
Total Expenditures	**319,617,698**	**312,291,356**	**327,598,173**	**342,115,099**	**355,668,882**
Net Operating Expenditures	**177,175,069**	**188,046,676**	**199,214,230**	**211,274,643**	**222,421,460**

Note: Totals may not add due to rounding.

General Fund - operating summary by division

2023 Net Operating Expenditure



Net Operating Expenditure by Year

	2023	2024	2025	2026	2027
City Administration	2,488,272	2,547,848	2,601,499	2,666,355	2,731,966
City Clerks	1,617,092	1,786,886	1,895,493	1,953,460	2,011,739
Planning & Development Services	(382,496)	(99,128)	76,748	263,266	460,321
Partnerships & Investments	9,871,586	9,848,908	10,146,993	10,433,618	10,716,339
Infrastructure	40,279,072	43,378,231	45,637,518	47,577,986	49,543,210
Active Living & Culture	11,517,155	11,600,522	12,014,771	12,262,715	12,514,300
Corporate & Protective Services					
Corporate Services	7,451,944	9,098,666	11,139,290	13,345,242	15,682,815
Community Safety	52,793,649	55,935,872	57,952,094	60,122,232	62,293,149
Fire Department	22,667,716	23,477,852	24,085,914	24,923,904	25,762,409
Corporate Strategic Services	10,178,364	11,042,800	11,418,238	11,750,114	12,083,926
Financial Services	6,798,054	7,055,128	7,306,967	7,606,296	7,880,891
Debt & Other	11,894,661	12,373,091	14,938,705	18,369,455	20,740,395
Total Division Net Operating Expenditures	**177,175,069**	**188,046,676**	**199,214,230**	**211,274,643**	**222,421,460**

Note: Totals may not add due to rounding.

City Administration

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	0	0	0	0	0
Fees and Charges	0	0	0	0	0
Sales of Service	0	0	0	0	0
User Fees	0	0	0	0	0
Other Revenue	0	0	0	0	0
Interest	0	0	0	0	0
Grants	0	0	0	0	0
Services to Other Governments	0	0	0	0	0
Interdepartment Transfer	0	0	0	0	0
Transfers from Funds	(14,500)	0	0	0	0
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(14,500)	0	0	0	0
Total Revenue	**(14,500)**	**0**	**0**	**0**	**0**
Expenditures					
Salaries and Wages	1,227,847	1,264,356	1,302,023	1,340,889	1,379,990
Internal Equipment	21,090	21,512	21,942	22,381	22,829
Material and Other	907,405	908,621	917,108	935,450	954,159
Contract Services	346,430	353,359	360,426	367,635	374,988
Debt Interest	0	0	0	0	0
Debt Principal	0	0	0	0	0
Internal Allocations	0	0	0	0	0
Interdepartment Transfer	0	0	0	0	0
Interfund Transfer	0	0	0	0	0
Transfer to Funds	0	0	0	0	0
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	0	0	0	0	0
Total Expenditures	**2,502,772**	**2,547,848**	**2,601,499**	**2,666,355**	**2,731,966**
Net Operating Expenditures	**2,488,272**	**2,547,848**	**2,601,499**	**2,666,355**	**2,731,966**

Note: Totals may not add due to rounding.

City Clerk

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	0	0	0	0	0
Fees and Charges	(10,000)	(10,359)	(10,731)	(11,116)	(11,501)
Sales of Services	(1,900)	(1,968)	(2,039)	(2,112)	(2,185)
User Fees	(8,100)	(8,391)	(8,692)	(9,004)	(9,316)
Other Revenue	(80,000)	(81,600)	(83,232)	(84,897)	(86,595)
Interest	0	0	0	0	0
Grants	0	0	0	0	0
Services to Other Governments	0	0	0	0	0
Interdepartment Transfer	(80,000)	(81,600)	(83,232)	(84,897)	(86,595)
Transfers from Funds	0	0	0	0	0
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	0	0	0	0	0
Total Revenue	**(90,000)**	**(91,959)**	**(93,963)**	**(96,013)**	**(98,096)**
Expenditures					
Salaries and Wages	1,129,555	1,228,116	1,272,206	1,317,878	1,363,608
Internal Equipment	0	0	0	0	0
Material and Other	482,077	553,360	617,933	630,292	642,898
Contract Services	95,460	97,369	99,317	101,303	103,329
Debt Interest	0	0	0	0	0
Debt Principal	0	0	0	0	0
Internal Allocations	0	0	0	0	0
Interdepartment Transfer	0	0	0	0	0
Interfund Transfer	0	0	0	0	0
Transfer to Funds	0	0	0	0	0
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	0	0	0	0	0
Total Expenditures	**1,707,092**	**1,878,845**	**1,989,456**	**2,049,473**	**2,109,835**
Net Operating Expenditures	**1,617,092**	**1,786,886**	**1,895,493**	**1,953,460**	**2,011,739**

Note: Totals may not add due to rounding.

Planning & Development Services

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	0	0	0	0	0
Fees and Charges	(10,653,372)	(10,826,114)	(11,001,670)	(11,180,086)	(11,349,033)
Sales of Services	(10,653,372)	(10,826,114)	(11,001,670)	(11,180,086)	(11,349,033)
User Fees	-	0	0	0	0
Other Revenue	(663,900)	(181,866)	(78,030)	(79,591)	(81,183)
Interest	0	0	0	0	0
Grants	(485,600)	0	0	0	0
Services to Other Governments	0	0	0	0	0
Interdepartment Transfer	(178,300)	(181,866)	(78,030)	(79,591)	(81,183)
Transfer from Funds	(1,754,100)	(175,880)	(155,880)	(155,880)	(155,880)
Special (Stat Reserve) Funds	(75,000)	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(1,679,100)	(175,880)	(155,880)	(155,880)	(155,880)
Total Revenue	**(13,071,372)**	**(11,183,860)**	**(11,235,580)**	**(11,415,557)**	**(11,586,096)**
Expenditures					
Salaries and Wages	8,976,231	9,053,073	9,267,228	9,599,921	9,933,038
Internal Equipment	118,487	123,917	126,395	128,923	131,501
Material and Other	3,169,648	1,481,842	1,491,387	1,521,215	1,551,639
Contract Services	69,510	70,900	72,318	73,764	75,239
Debt Interest	0	0	0	0	0
Debt Principal	0	0	0	0	0
Internal Allocations	55,000	55,000	55,000	55,000	55,000
Interdepartment Transfer	55,000	55,000	55,000	55,000	55,000
Interfund Transfer	0	0	0	0	0
Transfer to Funds	300,000	300,000	300,000	300,000	300,000
Special (Stat Reserve) Funds	300,000	300,000	300,000	300,000	300,000
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	0	0	0	0	0
Total Expenditures	**12,688,876**	**11,084,732**	**11,312,328**	**11,678,823**	**12,046,417**
Net Operating Expenditures	**(382,496)**	**(99,128)**	**76,748**	**263,266**	**460,321**

Note: Totals may not add due to rounding.

Partnerships & Investments

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	0	0	0	0	0
Fees and Charges	(10,087,520)	(10,291,650)	(10,499,949)	(10,722,485)	(10,954,774)
Sales of Services	(7,877,056)	(8,034,597)	(8,195,289)	(8,359,195)	(8,526,379)
User Fees	(2,210,464)	(2,257,053)	(2,304,660)	(2,363,290)	(2,428,395)
Other Revenue	(607,488)	(468,858)	(479,435)	(489,023)	(498,803)
Interest	0	0	0	0	0
Grants	(89,400)	(1,200)	(2,424)	(2,472)	(2,521)
Services to Other Governments	0	0	0	0	0
Interdepartment Transfer	(518,088)	(467,658)	(477,011)	(486,551)	(496,282)
Transfer from Funds	(2,172,730)	(424,340)	(424,340)	(424,340)	(424,340)
Special (Stat Reserve) Funds	(552,600)	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(1,620,130)	(424,340)	(424,340)	(424,340)	(424,340)
Total Revenue	**(12,867,738)**	**(11,184,848)**	**(11,403,724)**	**(11,635,848)**	**(11,877,917)**
Expenditures					
Salaries and Wages	5,738,045	5,791,256	6,006,216	6,221,839	6,437,737
Internal Equipment	311,052	317,273	323,619	330,091	336,693
Material and Other	8,623,903	6,705,819	6,845,094	6,981,996	7,121,636
Contract Services	3,138,532	3,223,117	3,310,177	3,399,790	3,490,205
Debt Interest	0	0	0	0	0
Debt Principal	0	0	0	0	0
Internal Allocations	673,260	673,260	673,260	673,260	673,260
Interdepartment Transfer	673,260	673,260	673,260	673,260	673,260
Interfund Transfer	0	0	0	0	0
Transfer to Funds	4,254,532	4,323,031	4,392,351	4,462,490	4,534,725
Special (Stat Reserve) Funds	3,708,862	3,777,361	3,846,681	3,916,820	3,989,055
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	545,670	545,670	545,670	545,670	545,670
Total Expenditures	**22,739,324**	**21,033,756**	**21,550,717**	**22,069,466**	**22,594,256**
Net Operating Expenditures	**9,871,586**	**9,848,908**	**10,146,993**	**10,433,618**	**10,716,339**

Note: Totals may not add due to rounding.

Infrastructure

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	0	0	0	0	0
Fees and Charges	(42,063,900)	(42,874,993)	(43,603,828)	(44,444,752)	(45,292,737)
Sales of Service	(35,744,924)	(36,431,417)	(37,033,188)	(37,744,536)	(38,460,928)
User Fees	(6,318,976)	(6,443,576)	(6,570,640)	(6,700,216)	(6,831,809)
Other Revenue	(16,507,388)	(15,896,470)	(16,118,678)	(16,386,085)	(16,641,625)
Interest	0	0	0	0	0
Grants	(12,569,900)	(12,754,320)	(12,957,113)	(13,163,131)	(13,356,629)
Services to Other Governments	(1,333,400)	(1,239,233)	(1,263,328)	(1,287,893)	(1,312,730)
Interdepartment Transfer	(2,604,088)	(1,902,917)	(1,898,237)	(1,935,061)	(1,972,266)
Transfers from Funds	(3,278,271)	(634,131)	(577,131)	(577,131)	(577,131)
Special (Stat Reserve) Funds	(508,971)	(76,071)	(76,071)	(76,071)	(76,071)
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(2,769,300)	(558,060)	(501,060)	(501,060)	(501,060)
Total Revenue	**(61,849,559)**	**(59,405,594)**	**(60,299,637)**	**(61,407,968)**	**(62,511,493)**
Expenditures					
Salaries and Wages	21,963,444	23,105,293	23,950,102	24,809,911	25,670,815
Internal Equipment	7,611,612	8,051,595	8,425,812	8,725,426	9,025,488
Material and Other	16,562,106	13,852,280	14,348,850	14,725,767	15,106,420
Contract Services	40,409,823	41,702,436	43,151,287	44,700,418	46,251,523
Debt Interest	0	0	0	0	0
Debt Principal	0	0	0	0	0
Internal Allocations	3,662,669	3,450,269	2,515,269	2,515,269	2,515,269
Interdepartment Transfer	3,662,669	3,450,269	2,515,269	2,515,269	2,515,269
Interfund Transfer	0	0	0	0	0
Transfer to Funds	11,918,977	12,621,952	13,545,835	13,509,163	13,485,188
Special (Stat Reserve) Funds	10,991,362	11,690,537	12,610,130	12,568,653	12,540,300
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	927,615	931,415	935,705	940,510	944,888
Total Expenditures	**102,128,631**	**102,783,825**	**105,937,155**	**108,985,954**	**112,054,703**
Net Operating Expenditures	**40,279,072**	**43,378,231**	**45,637,518**	**47,577,986**	**49,543,210**

Note: Totals may not add due to rounding.

Active Living & Culture

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	0	0	0	0	0
Fees and Charges	(5,589,740)	(5,800,771)	(6,009,019)	(6,224,743)	(6,440,741)
Sales of Service	(4,027,290)	(4,182,229)	(4,332,371)	(4,487,903)	(4,643,633)
Other	-	-	-	-	-
User Fees	(1,562,450)	(1,618,542)	(1,676,648)	(1,736,840)	(1,797,108)
Other Revenue	(660,300)	(188,904)	(192,682)	(196,536)	(200,467)
Interest	0	0	0	0	0
Grants	(585,100)	(112,200)	(114,444)	(116,733)	(119,068)
Other	-	-	-	-	-
Services to Other Governments	-	-	-	-	-
Interdepartment Transfer	(75,200)	(76,704)	(78,238)	(79,803)	(81,399)
Interfund Transfer	-	-	-	-	-
Transfers from Funds	(1,249,800)	-	-	-	0
Special (Stat Reserve) Funds	(20,000)	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(1,229,800)	-	-	-	0
Total Revenue	**(7,499,840)**	**(5,989,675)**	**(6,201,701)**	**(6,421,279)**	**(6,641,208)**
Expenditures					
Salaries and Wages	7,299,530	7,603,713	7,969,187	8,255,281	8,541,739
Internal Equipment	194,400	198,288	202,254	206,299	210,425
Material and Other	4,693,955	3,359,184	3,446,036	3,514,957	3,585,256
Contract Services	5,639,706	5,253,108	5,423,091	5,531,553	5,642,184
Debt Interest	0	0	0	0	0
Debt Principal	0	0	0	0	0
Internal Allocations	0	0	0	0	0
Interdepartment Transfer	0	0	0	0	0
Interfund Transfer	0	0	0	0	0
Transfer to Funds	1,189,404	1,175,904	1,175,904	1,175,904	1,175,904
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	1,189,404	1,175,904	1,175,904	1,175,904	1,175,904
Total Expenditures	**19,016,995**	**17,590,197**	**18,216,472**	**18,683,994**	**19,155,508**
Net Operating Expenditures	**11,517,155**	**11,600,522**	**12,014,771**	**12,262,715**	**12,514,300**

Note: Totals may not add due to rounding.

Corporate & Protective Services - Corporate Services

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	0	0	0	0	0
Fees and Charges	(61,000)	(62,220)	(63,464)	(64,733)	(66,028)
Sales of Service	(5,000)	(5,100)	(5,202)	(5,306)	(5,412)
Other	0	0	0	0	0
User Fees	(56,000)	(57,120)	(58,262)	(59,427)	(60,616)
Other Revenue	(325,760)	(332,275)	(338,921)	(345,699)	(352,613)
Interest	0	0	0	0	0
Grants	0	0	0	0	0
Services to Other Governments	0	0	0	0	0
Interdepartment Transfer	(325,760)	(332,275)	(338,921)	(345,699)	(352,613)
Transfers from Funds	(572,840)	(128,800)	0	0	0
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(572,840)	(128,800)	0	0	0
Total Revenue	**(959,600)**	**(523,295)**	**(402,385)**	**(410,432)**	**(418,641)**
Expenditures					
Salaries and Wages	3,471,881	4,844,438	6,707,431	8,824,745	11,071,908
Internal Equipment	900	918	936	955	974
Material and Other	3,536,127	3,345,916	3,374,006	3,441,486	3,510,316
Contract Services	1,402,636	1,430,689	1,459,302	1,488,488	1,518,258
Debt Interest	0	0	0	0	0
Debt Principal	0	0	0	0	0
Internal Allocations	0	0	0	0	0
Interdepartment Transfer	0	0	0	0	0
Interfund Transfer	0	0	0	0	0
Transfer to Funds	0	0	0	0	0
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	0	0	0	0	0
Total Expenditures	**8,411,544**	**9,621,961**	**11,541,675**	**13,755,674**	**16,101,456**
Net Operating Expenditures	**7,451,944**	**9,098,666**	**11,139,290**	**13,345,242**	**15,682,815**

Note: Totals may not add due to rounding.

Corporate & Protective Services - Community Safety

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	0	0	0	0	0
Fees and Charges	(934,241)	(957,603)	(981,600)	(1,006,251)	(1,031,183)
Sale of Service	(797,154)	(816,811)	(836,994)	(857,719)	(878,690)
User Fees	(137,087)	(140,792)	(144,606)	(148,532)	(152,493)
Other Revenue	(7,402,387)	(5,917,313)	(6,035,659)	(6,156,373)	(6,279,500)
Interest	0	0	0	0	0
Grants	(5,778,900)	(4,261,356)	(4,346,583)	(4,433,515)	(4,522,185)
Services to Other Governments	(1,393,292)	(1,421,158)	(1,449,581)	(1,478,573)	(1,508,144)
Interdepartment Transfer	(230,195)	(234,799)	(239,495)	(244,285)	(249,171)
Transfers from Funds	(9,172,900)	(147,220)	(147,220)	(147,220)	(147,220)
Special (Stat Reserve) Funds	(300,000)	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(8,872,900)	(147,220)	(147,220)	(147,220)	(147,220)
Total Revenue	**(17,509,528)**	**(7,022,136)**	**(7,164,479)**	**(7,309,844)**	**(7,457,903)**
Expenditures					
Salaries and Wages	11,620,014	11,843,407	12,268,586	12,709,028	13,150,031
Internal Equipment	148,466	151,435	154,464	157,553	160,704
Material and Other	3,504,173	1,252,236	1,198,624	1,222,596	1,247,048
Contract Services	55,030,524	49,710,930	51,494,899	53,342,899	55,193,269
Debt Interest	0	0	0	0	0
Debt Principal	0	0	0	0	0
Internal Allocations	0	0	0	0	0
Interdepartment Transfer	0	0	0	0	0
Interfund Transfer	0	0	0	0	0
Transfer to Funds	0	0	0	0	0
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	0	0	0	0	0
Total Expenditures	**70,303,177**	**62,958,008**	**65,116,573**	**67,432,076**	**69,751,052**
Net Operating Expenditures	**52,793,649**	**55,935,872**	**57,952,094**	**60,122,232**	**62,293,149**

Note: Totals may not add due to rounding.

Corporate & Protective Services - Fire Department

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	0	0	0	0	0
Fees and Charges	(2,760,588)	(2,815,799)	(2,872,116)	(2,929,558)	(2,988,149)
Sales of Service	(770,622)	(786,034)	(801,755)	(817,790)	(834,146)
User Fees	(1,989,966)	(2,029,765)	(2,070,361)	(2,111,768)	(2,154,003)
Other Revenue	(436,612)	(445,344)	(454,251)	(463,336)	(472,603)
Interest	0	0	0	0	0
Grants	0	0	0	0	0
Services to Other Governments	(436,612)	(445,344)	(454,251)	(463,336)	(472,603)
Interdepartment Transfer	0	0	0	0	0
Transfers from Funds	(150,000)	0	0	0	0
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(150,000)	0	0	0	0
Total Revenue	**(3,347,200)**	**(3,261,143)**	**(3,326,367)**	**(3,392,894)**	**(3,460,752)**
Expenditures					
Salaries and Wages	22,337,994	23,276,874	24,162,734	25,030,176	25,898,723
Internal Equipment	176,743	180,278	183,883	187,561	191,312
Material and Other	1,548,656	1,431,306	1,461,033	1,490,254	1,520,059
Contract Services	200,691	204,705	208,799	212,975	217,235
Debt Interest	0	0	0	0	0
Debt Principal	0	0	0	0	0
Internal Allocations	16,000	16,000	16,000	16,000	16,000
Interdepartment Transfer	16,000	16,000	16,000	16,000	16,000
Interfund Transfer	0	0	0	0	0
Transfer to Funds	1,734,832	1,629,832	1,379,832	1,379,832	1,379,832
Special (Stat Reserve) Funds	1,255,000	1,150,000	900,000	900,000	900,000
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	479,832	479,832	479,832	479,832	479,832
Total Expenditures	**26,014,916**	**26,738,995**	**27,412,281**	**28,316,798**	**29,223,161**
Net Operating Expenditures	**22,667,716**	**23,477,852**	**24,085,914**	**24,923,904**	**25,762,409**

Note: Totals may not add due to rounding.

Corporate Strategic Services

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	0	0	0	0	0
Fees and Charges	(110,400)	(112,608)	(114,860)	(117,157)	(119,500)
Sales of Service	(2,400)	(2,448)	(2,497)	(2,547)	(2,598)
User Fees	(108,000)	(110,160)	(112,363)	(114,610)	(116,902)
Other Revenue	(165,932)	(115,293)	(117,598)	(119,950)	(122,349)
Interest	0	0	0	0	0
Grants	(52,900)	0	0	0	0
Services to Other Governments	0	0	0	0	0
Interdepartment Transfer	(113,032)	(115,293)	(117,598)	(119,950)	(122,349)
Transfers from Funds	(253,900)	0	0	0	0
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(253,900)	0	0	0	0
Total Revenue	**(530,232)**	**(227,901)**	**(232,458)**	**(237,107)**	**(241,849)**
Expenditures					
Salaries and Wages	6,456,867	6,750,926	6,993,284	7,244,343	7,495,722
Internal Equipment	6,500	6,630	6,763	6,898	7,036
Material and Other	4,056,709	4,092,305	4,229,075	4,313,657	4,399,930
Contract Services	36,000	36,720	37,454	38,203	38,967
Debt Interest	0	0	0	0	0
Debt Principal	0	231,600	231,600	231,600	231,600
RCMP CONTRACT	0				
Internal Allocations	0	0	0	0	0
Interdepartment Transfer	0	0	0	0	0
Interfund Transfer	0	0	0	0	0
Transfer to Funds	152,520	152,520	152,520	152,520	152,520
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	152,520	152,520	152,520	152,520	152,520
Total Expenditures	**10,708,596**	**11,270,701**	**11,650,696**	**11,987,221**	**12,325,775**
Net Operating Expenditures	**10,178,364**	**11,042,800**	**11,418,238**	**11,750,114**	**12,083,926**

Note: Totals may not add due to rounding.

Financial Services

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	0	0	0	0	0
Fees and Charges	(536,087)	(555,333)	(575,269)	(555,333)	(554,689)
Sales of Service	(536,087)	(555,333)	(575,269)	(555,333)	(554,689)
Other	0	0	0	0	0
User Fees	0	0	0	0	0
Other Revenue	(1,094,491)	(1,038,345)	(1,063,055)	(1,089,929)	(1,122,940)
Interest	0	0	0	0	0
Grants	0	0	0	0	0
Other	0	0	0	0	0
Services to Other Governments	0	0	0	0	0
Interdepartment Transfer	(1,094,491)	(1,038,345)	(1,063,055)	(1,089,929)	(1,122,940)
Interfund Transfer	0	0	0	0	0
Transfers from Funds	(498,500)	0	0	0	0
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(498,500)	0	0	0	0
Total Revenue	**(2,129,078)**	**(1,593,678)**	**(1,638,324)**	**(1,645,262)**	**(1,677,629)**
Expenditures					
Salaries and Wages	7,529,046	7,799,339	8,079,335	8,369,383	8,659,801
Internal Equipment	5,880	5,998	6,118	6,240	6,365
Material and Other	1,328,728	779,821	796,017	811,937	828,176
Contract Services	8,500	8,670	8,843	9,020	9,200
Debt Interest	0	0	0	0	0
Debt Principal	0	0	0	0	0
RCMP CONTRACT	0				
Internal Allocations	54,978	54,978	54,978	54,978	54,978
Interdepartment Transfer	54,978	54,978	54,978	54,978	54,978
Interfund Transfer	0	0	0	0	0
Transfer to Funds	0	0	0	0	0
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	0	0	0	0	0
Total Expenditures	**8,927,132**	**8,648,806**	**8,945,291**	**9,251,558**	**9,558,520**
Net Operating Expenditures	**6,798,054**	**7,055,128**	**7,306,967**	**7,606,296**	**7,880,891**

Note: Totals may not add due to rounding.

Financial Services - Debt & Other

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Library Requisition	(7,325,200)	(7,471,704)	(7,621,138)	(7,773,561)	(7,929,032)
Parcel Tax	(142,448)	(142,448)	(142,448)	(142,448)	(142,448)
Fees and Charges	(608,265)	(608,177)	(608,177)	(608,177)	(608,177)
Sales of Service	(525,000)	(525,000)	(525,000)	(525,000)	(525,000)
User Fees	(83,265)	(83,177)	(83,177)	(83,177)	(83,177)
Other Revenue	(12,759,751)	(13,014,946)	(13,275,246)	(12,605,750)	(12,857,865)
Interest	(1,910,490)	(1,948,700)	(1,987,674)	(2,027,427)	(2,067,976)
Grants	0	0	0	0	0
Services to Other Governments	(5,664,123)	(5,777,405)	(5,892,954)	(6,010,813)	(6,131,029)
Interdepartment Transfer	(5,185,138)	(5,288,841)	(5,394,618)	(4,567,510)	(4,658,860)
Transfers from Funds	(1,738,318)	(2,523,316)	(4,738,316)	(5,738,316)	(5,738,316)
Special (Stat Reserve) Funds	(942,918)	(1,727,916)	(3,942,916)	(4,942,916)	(4,942,916)
Development Cost Charges	(795,400)	(795,400)	(795,400)	(795,400)	(795,400)
Accumulated Surplus	0	0	0	0	0
Total Revenue	**(22,573,982)**	**(23,760,591)**	**(26,385,325)**	**(26,868,252)**	**(27,275,838)**
Expenditures					
Salaries and Wages	1,427,896	1,479,157	1,532,259	1,587,267	1,642,345
Internal Equipment	0	0	0	0	0
Material and Other	9,528,362	9,718,929	9,913,308	10,111,574	10,313,805
Contract Services	0	476,000	476,000	493,088	510,198
Debt Interest	2,838,890	4,586,506	7,841,954	10,519,185	11,688,491
Debt Principal	3,948,472	3,948,467	5,606,386	7,484,890	8,800,723
Internal Allocations	213,000	213,000	213,000	213,000	213,000
Interdepartment Transfer	213,000	213,000	213,000	213,000	213,000
Interfund Transfer	0	0	0	0	0
Transfer to Funds	16,512,023	15,711,623	15,741,123	14,828,703	14,847,670
Special (Stat Reserve) Funds	15,240,623	14,440,223	14,469,723	14,492,303	14,511,270
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	1,271,400	1,271,400	1,271,400	336,400	336,400
Total Expenditures	**34,468,643**	**36,133,682**	**41,324,030**	**45,237,707**	**48,016,232**
Net Operating Expenditures	**11,894,661**	**12,373,091**	**14,938,705**	**18,369,455**	**20,740,395**

Note: Totals may not add due to rounding.

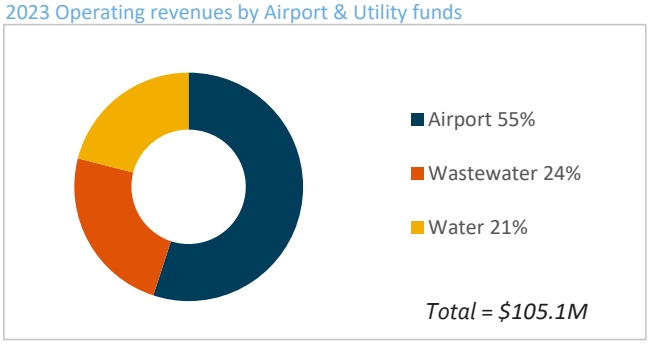
Operating Summary - Airport & Utility Funds

Revenues and Expenditures by Year

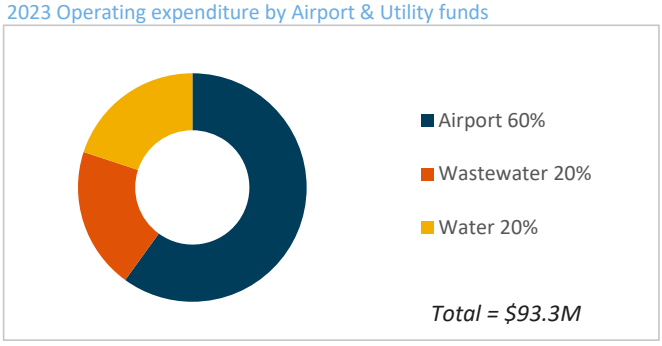
	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	(3,291,225)	(3,244,478)	(3,083,644)	(2,736,281)	(2,501,319)
Fees and Charges	(91,177,400)	(91,844,577)	(97,638,045)	(101,339,079)	(103,577,037)
Sales of Service	(88,815,650)	(91,697,147)	(97,489,666)	(101,189,732)	(103,426,703)
Other	0	0	0	0	0
User Fees	(2,361,750)	(147,430)	(148,379)	(149,347)	(150,334)
Other Revenue	(3,198,246)	(9,175,787)	(8,945,437)	(5,651,718)	(5,668,776)
Interest	(847,812)	(2,577,593)	(2,954,780)	(2,875,525)	(2,850,193)
Grants	(277,839)	(4,027,840)	(3,378,679)	(121,996)	(121,996)
Other	0	(584,854)	(594,153)	(602,887)	(611,749)
Interdepartment Transfer	(1,168,535)	(1,096,240)	(1,128,565)	(1,162,050)	(1,195,578)
Transfers from Funds	(7,402,110)	(3,948,590)	(6,630,040)	(6,837,437)	(20,212,068)
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(7,402,110)	(3,948,590)	(6,630,040)	(6,837,437)	(20,212,068)
Total Revenue	**(105,068,981)**	**(108,213,433)**	**(116,297,167)**	**(116,564,516)**	**(131,959,200)**
Expenditures					
Salaries and Wages	16,934,208	18,564,682	19,133,476	20,035,512	20,651,753
Internal Equipment	1,944,067	1,995,698	2,035,612	2,076,324	2,117,850
Material and Other	22,988,342	15,088,886	16,275,181	18,149,884	18,696,242
Contract Services	1,966,270	8,545,939	8,652,407	8,839,521	8,934,080
Debt Interest	1,141,947	1,268,230	2,215,050	3,060,629	4,095,317
Debt Principal	2,970,112	2,960,828	3,457,251	5,853,064	5,528,774
Internal Allocations	6,728,500	5,531,238	5,756,265	5,839,756	5,985,068
Interdepartment Transfer	5,487,554	3,128,695	3,088,695	3,088,695	3,088,695
Interfund Transfer	1,240,946	2,402,543	2,667,570	2,751,061	2,896,373
Transfer to Funds	38,671,835	42,340,783	40,971,718	35,073,726	35,818,816
Special (Stat Reserve) Funds	198,460	198,460	198,460	198,460	198,460
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	38,473,375	42,142,323	40,773,258	34,875,266	35,620,356
Total Expenditures	**93,345,281**	**96,296,284**	**98,496,960**	**98,928,416**	**101,827,900**
Net Operating Expenditures	**(11,723,700)**	**(11,917,148)**	**(17,800,207)**	**(17,636,100)**	**(30,131,301)**

Note: Totals may not add due to rounding.

2023 Operating revenues by Airport & Utility funds



2023 Operating expenditure by Airport & Utility funds



Airport Fund

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	0	0	0	0	0
Fees and Charges	(50,939,660)	(51,499,134)	(55,275,173)	(56,862,720)	(56,862,720)
Sales of Service	(48,624,410)	(51,499,134)	(55,275,173)	(56,862,720)	(56,862,720)
User Fees	(2,315,250)	0	0	0	0
Other Revenue	(247,730)	(5,087,805)	(4,757,485)	(1,529,462)	(1,529,462)
Interest	(132,230)	(1,222,305)	(1,491,985)	(1,413,962)	(1,413,962)
Grants	(115,500)	(3,865,500)	(3,265,500)	(115,500)	(115,500)
Other	0	0	0	0	0
Interdepartment Transfer	0	0	0	0	0
Transfers from Funds	(5,703,810)	(2,709,141)	(4,582,115)	(5,773,566)	(5,218,091)
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(5,703,810)	(2,709,141)	(4,582,115)	(5,773,566)	(5,218,091)
Total Revenue	**(56,891,200)**	**(59,296,081)**	**(64,614,774)**	**(64,165,749)**	**(63,610,273)**
Expenditures					
Salaries and Wages	6,732,001	7,889,000	8,074,000	8,586,000	8,804,943
Internal Equipment	32,350	0	0	0	0
Material and Other	13,027,080	5,101,485	5,909,843	7,442,430	7,617,240
Contract Services	1,141,860	7,691,933	7,767,742	7,923,097	8,124,856
Debt Interest	584,250	711,650	1,439,650	1,788,500	1,568,000
Debt Principal	1,905,288	1,897,191	2,500,809	4,707,124	4,147,087
Internal Allocations	1,733,489	2,362,727	2,627,754	2,711,245	2,856,557
Interdepartment Transfer	1,685,159	0	0	0	0
Interfund Transfer	48,330	2,362,727	2,627,754	2,711,245	2,856,557
Transfer to Funds	31,734,882	33,642,094	36,294,976	31,007,353	30,491,590
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	31,734,882	33,642,094	36,294,976	31,007,353	30,491,590
Total Expenditures	**56,891,200**	**59,296,080**	**64,614,774**	**64,165,748**	**63,610,273**
Net Operating Expenditures	**0**	**0**	**0**	**0**	**0**
Surplus/(Deficit) (Included Above)	26,031,072	30,932,953	31,712,861	25,233,787	25,273,499

Note: Totals may not add due to rounding.

The Surplus/(Deficit) is the overall surplus/(deficit) budgeted for the fund during the year.

Water Fund

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	(2,051,046)	(2,256,609)	(2,281,482)	(2,306,008)	(2,330,895)
Fees and Charges	(18,649,740)	(18,375,982)	(19,621,419)	(20,935,663)	(22,346,164)
Sales of Service	(18,603,240)	(18,328,552)	(19,573,040)	(20,886,316)	(22,295,830)
User Fees	(46,500)	(47,430)	(48,379)	(49,347)	(50,334)
Other Revenue	(665,765)	(841,125)	(851,385)	(861,022)	(870,800)
Interest	(401,440)	(60,446)	(61,407)	(62,310)	(63,226)
Grants	0	0	0	0	0
Other	0	(584,854)	(594,153)	(602,887)	(611,749)
Interdepartment Transfer	(264,325)	(195,825)	(195,825)	(195,825)	(195,825)
Transfers from Funds	(1,197,800)	(880,749)	(1,689,225)	0	0
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(1,197,800)	(880,749)	(1,689,225)	0	0
Total Revenue	**(22,564,351)**	**(22,354,465)**	**(24,443,511)**	**(24,102,693)**	**(25,547,859)**
Expenditures					
Salaries and Wages	4,741,220	4,962,448	5,140,600	5,318,148	5,502,688
Internal Equipment	737,767	791,384	807,212	823,356	839,823
Material and Other	5,234,697	5,135,789	5,334,416	5,495,922	5,686,630
Contract Services	155,500	161,082	166,865	172,855	39,853
Debt Interest	275,752	274,635	274,106	274,106	274,106
Debt Principal	358,899	357,714	357,003	357,003	357,003
Internal Allocations	2,818,290	1,443,090	1,423,090	1,423,090	1,423,090
Interdepartment Transfer	2,028,974	1,403,274	1,383,274	1,383,274	1,383,274
Interfund Transfer	789,316	39,816	39,816	39,816	39,816
Transfer to Funds	3,882,226	3,543,336	3,535,453	3,671,913	4,932,766
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	3,882,226	3,543,336	3,535,453	3,671,913	4,932,766
Total Expenditures	**18,204,351**	**16,669,478**	**17,038,745**	**17,536,393**	**19,055,959**
Net Operating Expenditures	**(4,360,000)**	**(5,684,987)**	**(7,404,766)**	**(6,566,300)**	**(6,491,900)**
Surplus/(Deficit) (Included Above)	386,186	(872,249)	(1,689,225)	138,855	1,399,164

Note: Totals may not add due to rounding.

The Net Operating Expenditures total is the amount of funding required for capital expenditures in the specific year. The Surplus/(Deficit) is the overall surplus/(deficit) budgeted for the fund during the year.

Wastewater Fund

Revenues and Expenditures by Year

	2023	2024	2025	2026	2027
Revenue					
Parcel Tax	(1,240,179)	(987,869)	(802,162)	(430,273)	(170,424)
Fees and Charges	(21,588,000)	(21,969,461)	(22,741,453)	(23,540,696)	(24,368,153)
Sales of Service	(21,588,000)	(21,869,461)	(22,641,453)	(23,440,696)	(24,268,153)
Other	0	0	0	0	0
User Fees	0	(100,000)	(100,000)	(100,000)	(100,000)
Other Revenue	(2,284,751)	(3,246,857)	(3,336,567)	(3,261,234)	(3,268,514)
Interest	(314,142)	(1,294,842)	(1,401,388)	(1,399,253)	(1,373,005)
Grants	(162,339)	(162,340)	(113,179)	(6,496)	(6,496)
Other	0	0	0	0	0
Interdepartment Transfer	(904,210)	(900,415)	(932,740)	(966,225)	(999,753)
Transfers from Funds	(500,500)	(358,700)	(358,700)	(1,063,871)	(14,993,977)
Special (Stat Reserve) Funds	0	0	0	0	0
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	(500,500)	(358,700)	(358,700)	(1,063,871)	(14,993,977)
Total Revenue	**(25,613,430)**	**(26,562,887)**	**(27,238,882)**	**(28,296,074)**	**(42,801,068)**
Expenditures					
Salaries and Wages	5,460,987	5,713,234	5,918,876	6,131,364	6,344,122
Internal Equipment	1,173,950	1,204,314	1,228,400	1,252,968	1,278,027
Material and Other	4,726,565	4,851,612	5,030,922	5,211,532	5,392,372
Contract Services	668,910	692,924	717,800	743,569	769,371
Debt Interest	281,945	281,945	501,294	998,023	2,253,211
Debt Principal	705,925	705,923	599,439	788,937	1,024,683
Internal Allocations	2,176,721	1,725,421	1,705,421	1,705,421	1,705,421
Interdepartment Transfer	1,773,421	1,725,421	1,705,421	1,705,421	1,705,421
Interfund Transfer	403,300	0	0	0	0
Transfer to Funds	3,054,727	5,155,353	1,141,289	394,460	394,460
Special (Stat Reserve) Funds	198,460	198,460	198,460	198,460	198,460
Development Cost Charges	0	0	0	0	0
Accumulated Surplus	2,856,267	4,956,893	942,829	196,000	196,000
Total Expenditures	**18,249,730**	**20,330,727**	**16,843,442**	**17,226,274**	**19,161,668**
Net Operating Expenditures	**(7,363,700)**	**(6,232,160)**	**(10,395,440)**	**(11,069,800)**	**(23,639,400)**
Surplus/(Deficit) (Included Above)	2,660,267	4,760,893	746,829	(705,171)	(13,930,106)

Note: Totals may not add due to rounding.

The Net Operating Expenditures total is the amount of funding required for capital expenditures in the specific year. The Surplus/(Deficit) is the overall surplus/(deficit) budgeted for the fund during the year.

Capital Summary - General Fund

Cost Centre		2023	2024	2025	2026	2027
300	Real Estate & Parking	4,279,300	4,878,812	4,726,924	6,345,454	2,908,048
301	Buildings	18,591,100	183,144,959	60,996,272	3,562,238	3,139,229
302	Parks	53,714,100	24,194,884	29,427,687	24,641,418	27,843,913
304	Transportation	58,689,700	19,337,308	25,148,311	27,579,738	37,262,043
305	Solid Waste	17,340,200	13,510,000	10,360,000	4,460,000	2,910,000
306	Storm Drainage	16,840,200	7,161,737	7,524,195	7,351,015	1,504,350
308	Information Services	4,316,700	2,992,408	1,147,175	998,617	794,024
310	Vehicle & Mobile Equipment	8,723,300	4,546,300	5,167,400	5,279,000	5,177,800
311	Fire	3,927,600	823,768	357,141	151,648	3,884,776
		186,422,200	**260,590,176**	**144,855,105**	**80,369,128**	**85,424,183**
Funding Sources:						
	General Taxation	15,131,800	16,255,000	17,453,000	18,727,000	19,981,000
	Surplus/Reserves	100,388,900	58,289,701	41,650,278	30,637,378	29,732,181
	Development Cost Charges	51,664,600	20,873,542	29,966,849	25,924,685	33,497,763
	Debenture/Borrowing	8,507,400	161,039,504	50,989,600	0	0
	Federal/Provincial Funding*	8,185,700	2,337,049	2,825,678	2,788,745	272,000
	Dev/Comm/Other Contributions	1,391,000	877,480	1,200,100	1,424,920	1,352,839
	Utility Revenue	1,152,800	917,900	769,600	866,400	588,400
		186,422,200	**260,590,176**	**144,855,105**	**80,369,128**	**85,424,183**

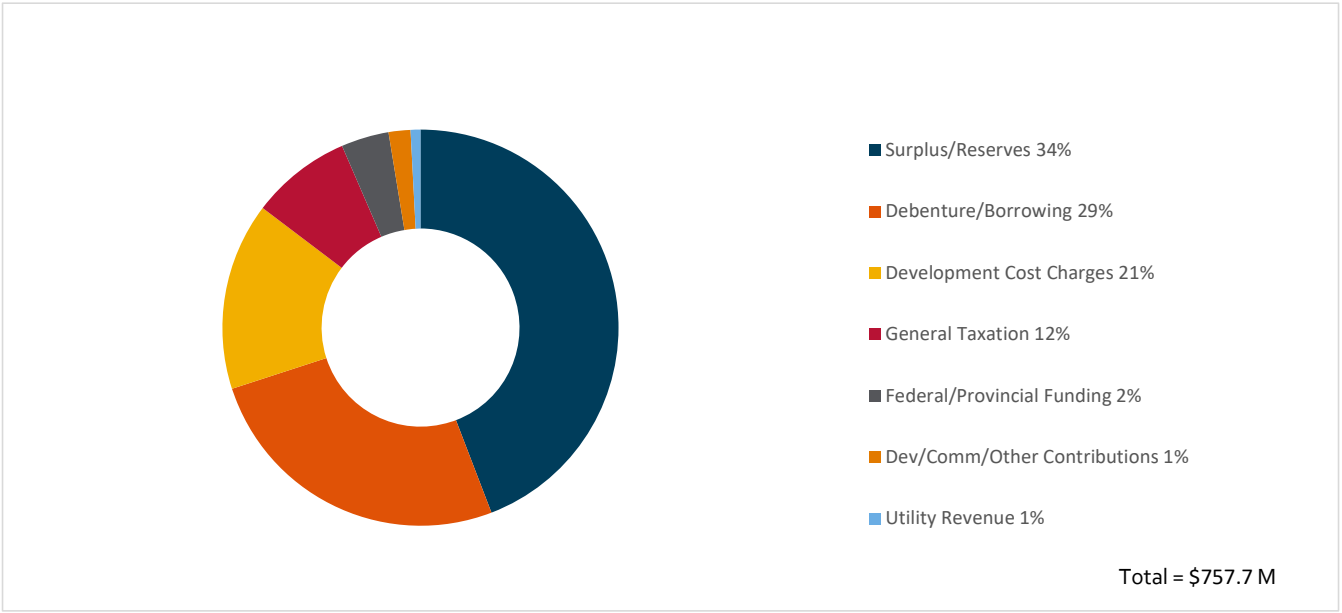
Total Five-Year Capital Program **757,660,792**

* 10-Year Capital Plan only includes confirmed Federal and Provincial Funding

Note: Totals may not add due to rounding.

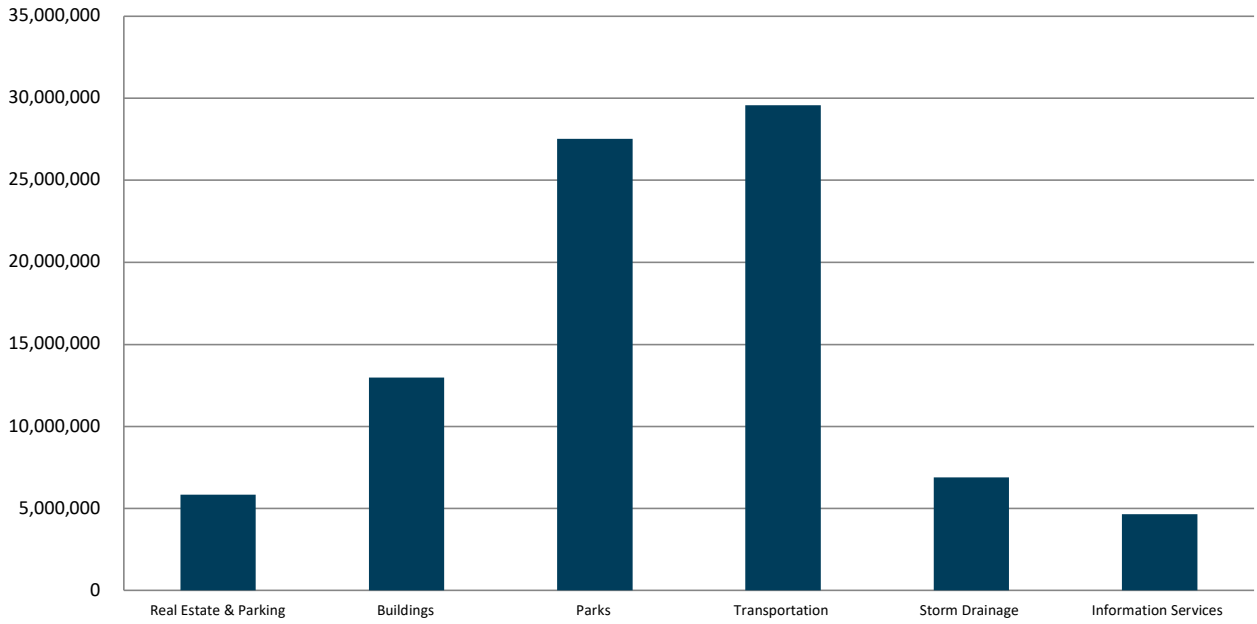
General Fund Capital Funding 2023 to 2027

The below graph summarizes the overall capital plan funding over the next five years.



Capital Funding Summary by Cost Centre

General Fund 2023 to 2027 - Taxation



Cost Centre		Total $	%	General Fund Taxation	%
300	**Real Estate & Parking**	23,138,538	3	5,828,838	7
301	**Buildings**	269,433,798	36	12,978,011	15
302	**Parks**	159,822,002	21	27,523,059	31
304	**Transportation**	168,017,100	22	29,573,111	34
305	**Solid Waste**	48,580,200	6	0	0
306	**Storm Drainage**	40,381,497	5	6,877,545	8
308	**Information Services**	10,248,924	2	4,657,937	5
310	**Vehicle & Mobile Equipment**	28,893,800	4	109,300	0
311	**Fire**	9,144,933	1	0	0
Total Five-Year Program		**757,660,792**	100.0	**87,547,800**	100.0

Note: Totals may not add due to rounding.

Real Estate & Parking Capital

Plan No.	Plan Description
L1	**General Land** Annual allocation for the purchase of land for general purposes. This may allow for acquiring properties at less than fair market value, creating land assembly opportunities, creating a revenue generating land bank and providing trade potential.
L2	**Road and Sidewalk Land Acquisition** To fund the purchase of land required for the widening of roads to accommodate road improvements and/or sidewalks.
L3	**Parking Infrastructure** Funding to renew parking infrastructure and to invest in efficient parking management technology.
L4	**Strategic Land Redevelopment** Funding to redevelop City owned land to improve public benefit and encourage economic development.

Plan No.	Plan Description	2023	2024	2025	2026	2027	Five-Year Total
L1	General Land	2,109,400	2,445,253	2,489,058	2,256,866	2,283,840	11,584,417
L2	Road and Sidewalk Land Acquisition	25,000	142,559	127,866	68,588	51,208	415,221
L3	Parking Infrastructure	1,894,900	2,041,000	1,860,000	3,770,000	323,000	9,888,900
L4	Strategic Land Redevelopment	250,000	250,000	250,000	250,000	250,000	1,250,000
		4,279,300	**4,878,812**	**4,726,924**	**6,345,454**	**2,908,048**	**23,138,538**

Funding Sources						
General Taxation	983,600	1,332,812	1,361,924	1,070,454	1,080,048	5,828,838
Surplus/Reserves	3,295,700	3,291,000	3,110,000	5,020,000	1,573,000	16,289,700
Development Cost Charges	0	0	0	0	0	0
Debenture/Borrowing	0	0	0	0	0	0
Federal/Provincial Funding	0	0	0	0	0	0
Dev/Comm/Other Contributions	0	255,000	255,000	255,000	255,000	1,020,000
Utility Revenue	0	0	0	0	0	0
	4,279,300	**4,878,812**	**4,726,924**	**6,345,454**	**2,908,048**	**23,138,538**

Note: Totals may not add due to rounding.

Building Capital

Plan No.	Plan Description
B1	**Parks and Recreation Buildings** An allocation for the development of new Parks and Recreation buildings as well as the redevelopment and expansion of existing ones in various locations throughout the City to keep pace with the increasing demand due to population growth and emerging trends. This
B2	**Community and Cultural Buildings** An allocation for the development of new community and cultural buildings as well as the redevelopment, renewal and expansion of existing ones. This category includes the theaters, libraries, senior centres, community halls, art gallery, museums and the RCA.
B3	**Civic/Protective Service Buildings** Funding to support renewal, replacement and cost of new Protective Services buildings which include firehalls, police stations and City Hall.
B4	**Transportation and Public Works Buildings** Funding to support renewal, replacement and new construction of new Transportation and Public Works Buildings throughout the City to keep pace increasing demand due to population growth and emerging trends. This category includes Public Works Yard, parkades, cemetery
B5	**Heritage Buildings** Funding for the restoration of City-owned heritage buildings.
B6	**Capital Opportunities and Partnerships** Funding for special projects including partnerships with the School District on community space as part of new school construction as well as funding to allow for capital projects that were not envisioned during the plan development, including partnerships.
B7	**Building Renewal, Rehabilitation & Infrastructure Upgrades** An allocation for major repairs or replacement of existing building infrastructure such as roofs, windows, mechanical systems, lighting, electrical and water services, hazardous material abatement, and other major maintenance items.

Plan No.	Plan Description	2023	2024	2025	2026	2027	Five-Year Total
B1	Parks and Recreation Buildings	6,475,800	2,427,600	36,762,400	1,072,250	780,000	47,518,050
B2	Community and Cultural Buildings	1,100,800	166,045,354	13,695,200	0	0	180,841,354
B3	Civic/Protective Service Buildings	2,939,400	12,348,800	8,092,000	0	0	23,380,200
B4	Transportation and Public Works Buildings	130,000	0	0	0	0	130,000
B5	Heritage Buildings	0	0	0	0	0	0
B6	Capital Opportunities and Partnerships	1,000,000	0	0	0	0	1,000,000
B7	Building Renewal, Rehab. & Infra. Upgrades	6,945,100	2,323,205	2,446,672	2,489,988	2,359,229	16,564,194
		18,591,100	**183,144,959**	**60,996,272**	**3,562,238**	**3,139,229**	**269,433,798**

Funding Sources						
General Taxation	2,891,000	2,942,004	2,723,405	2,251,305	2,170,297	12,978,011
Surplus/Reserves	15,700,100	19,163,451	7,283,267	1,310,933	968,932	44,426,683
Development Cost Charges	0	0	0	0	0	0
Debenture/Borrowing	0	161,039,504	50,989,600	0	0	212,029,104
Federal/Provincial Funding	0	0	0	0	0	0
Dev/Comm/Other Contributions	0	0	0	0	0	0
Utility Revenue	0	0	0	0	0	0
	18,591,100	**183,144,959**	**60,996,272**	**3,562,238**	**3,139,229**	**269,433,798**

Note: Totals may not add due to rounding.

Parks Capital

Plan No.	Plan Description
P1	**DCC Parkland Acquisition** Park acquisition program based on the residential growth in the City for the purchase of parkland (Neighbourhood, Community, Recreation and City-wide level parks) under the Development Cost Charge program (DCC). Funding is primarily allocated from developer revenue with general taxation covering both the assist factor and infill/conversion units and Land Use Contracts not required to pay DCC's.
P2	**Natural Area Parkland Acquisition** Park acquisition program for the purchase of Natural Areas not attributed to the DCC program.
P3	**Neighbourhood Park Development** An allocation to cover the development of neighbourhood level parks including off-site costs related to park development, but does not include buildings.
P4	**Community Park Development** An allocation to cover the development of community level parks including off-site costs related to park development, but does not include buildings.
P5	**Recreation Park Development** An allocation to cover the development of recreation level parks including off-site costs related to park development, but does not include buildings.
P6	**City-wide Park Development** An allocation to cover the development of city-wide level parks including off-site costs related to park development, but does not include buildings.
P7	**Linear/Natural Area Park Development** An allocation to cover the development of natural areas and linear parks/trails.
P8	**Park Renewal, Rehabilitation & Infrastructure Upgrades** An allocation for major repairs or replacement of existing park infrastructure such as sidewalks, hard-surfaced trails, parking lots, sport courts, lighting, electrical and water services, irrigation, fencing, bridges and other major structures.
P9	**Capital Opportunities Partnership** An allocation for various strategic investments into the park and open space system as well as funding to allow for capital projects that were not envisioned during the plan development, including partnerships.
P10	**Urban Streetscape and Urban Centres Development and Renewal** An allocation for urban centre improvements, enhanced streetscapes and walkways, and other urban spaces that are not defined parks.

Plan No.	Plan Description	2023	2024	2025	2026	2027	Five-Year Total
P1	DCC Parkland Acquisition	19,656,300	16,936,291	12,802,000	16,936,290	12,802,000	79,132,881
P2	Natural Area Parkland Acquisition	0	0	0	0	0	0
P3	Neighbourhood Park Development	1,144,800	2,702,604	1,946,193	2,299,737	1,902,000	9,995,334
P4	Community Park Development	14,168,600	0	0	0	0	14,168,600
P5	Recreation Park Development	11,813,000	197,689	2,886,246	0	4,839,376	19,736,311
P6	City-wide Park Development	2,072,600	3,082,900	8,584,398	3,985,491	5,060,637	22,786,026
P7	Linear/Natural Area Park Development	2,652,000	292,400	1,713,850	218,900	218,900	5,096,050
P8	Park Renew., Rehab. & Upgrades	1,979,500	983,000	1,495,000	1,201,000	3,021,000	8,679,500
P9	Capital Opportunities Partnership	192,400	0	0	0	0	192,400
P10	Urban Streetsc. and Centres Dev & Renew	34,900	0	0	0	0	34,900
		53,714,100	**24,194,884**	**29,427,687**	**24,641,418**	**27,843,913**	**159,822,002**
Funding Sources							
	General Taxation	5,980,900	4,804,485	5,160,279	4,659,581	6,917,814	27,523,059
	Surplus/Reserves	12,466,000	2,578,047	1,446,755	2,028,657	2,795,628	21,315,087
	Development Cost Charges	34,193,000	16,812,352	22,317,553	17,953,180	18,130,471	109,406,556
	Debenture/Borrowing	0	0	0	0	0	0
	Federal/Provincial Funding	1,074,200	0	0	0	0	1,074,200
	Dev/Comm/Other Contributions	0	0	503,100	0	0	503,100
	Utility Revenue	0	0	0	0	0	0
		53,714,100	**24,194,884**	**29,427,687**	**24,641,418**	**27,843,913**	**159,822,002**

Note: Totals may not add due to rounding.

Transportation Capital

Plan No.	Plan Description
T1	**DCC Roads** Allocation for design, land and construction costs associated with DCC Road projects.
T2	**DCC Roads - Active Transportation** Allocation for design, land and construction costs associated with DCC Active Transportation projects. General taxation to cover 77.7%
T3	**Non-DCC Roads** Infrastructure upgrades which are not part of the 20 Year Servicing Plan and Financing Strategy (collectors and local roads) and City initiated projects to upgrade streets to full urban standards including drainage, fillet paving, sidewalks and landscaped boulevards.
T4	**Transportation System Renewal** Allocation for overlay and other processes, including micro asphalting, for rehabilitation of City roads. Also includes renewal of curb and gutter, bike paths, retaining walls, handrails and stairways
T5	**Bicycle Network** Allocation for bike network system additions and improvements.
T6	**Sidewalk Network** Allocation required to complete the Non-DCC portion of the sidewalk network.
T7	**Safety and Operational Improvements** Allocation to cover field reviews and capital improvements for safety improvements or to improve operational efficiency. This will include projects such as left turn bays, traffic control changes, safety barriers, signs, markings, handicap access improvements and retrofit medians.
T8	**Traffic Control Infrastructure** This program is for construction of new traffic signal control infrastructure that is not part of the DCC program. This includes new traffic signals and pedestrian activated traffic signals, installation of new communication for the traffic signals system and where new development occurs install conduit for future traffic signals. Program also includes renewal of existing traffic signals.
T9	**Transit Facilities** Construction of new and renewal of existing transit facilities, bus pullouts and shelters.

Plan No.	Plan Description	2023	2024	2025	2026	2027	Five-Year Total
T1	Development Cost Charge Roads	23,704,800	3,860,068	9,694,428	9,384,818	20,395,885	67,039,999
T2	DCC Roads - Active Transportation	15,183,700	4,894,800	2,620,000	6,364,200	4,747,105	33,809,805
T3	Non-DCC Roads	2,527,600	1,120,000	970,000	970,000	770,000	6,357,600
T4	Transportation System Renewal	6,343,800	4,962,440	9,400,883	6,488,720	6,409,253	33,605,096
T5	Bicycle Network	1,634,000	580,000	818,000	1,300,000	910,000	5,242,000
T6	Sidewalk Network	5,313,200	3,200,000	975,000	1,075,000	1,075,000	11,638,200
T7	Safety and Operational Improvements	1,229,200	410,000	370,000	430,000	380,000	2,819,200
T8	Traffic Control Infrastructure	758,000	0	0	0	0	758,000
T9	Transit Facilities	1,995,400	310,000	300,000	1,567,000	2,574,800	6,747,200
		58,689,700	**19,337,308**	**25,148,311**	**27,579,738**	**37,262,043**	**168,017,100**
Funding Sources							
	General Taxation	3,382,300	4,291,987	4,728,619	8,939,070	8,231,135	29,573,111
	Surplus/Reserves	27,193,500	10,411,651	12,378,396	9,549,243	12,615,777	72,148,567
	Development Cost Charges	17,471,600	4,061,190	7,649,296	7,971,505	15,367,292	52,520,883
	Debenture/Borrowing	7,117,800	0	0	0	0	7,117,800
	Federal/Provincial Funding	2,263,200	0	0	0	0	2,263,200
	Dev/Comm/Other Contributions	1,261,300	572,480	392,000	1,119,920	1,047,839	4,393,539
	Utility Revenue	0	0	0	0	0	0
		58,689,700	**19,337,308**	**25,148,311**	**27,579,738**	**37,262,043**	**168,017,100**

Note: Totals may not add due to rounding.

Solid Waste Capital

Plan No.	Plan Description
SW1	**Equipment** Funding for new equipment and replacement of existing equipment.
SW2	**Site Improvement** Funding for site improvements like buildings, roads, landscaping and fencing.
SW3	**Gas Management** Required for design, installation and extension of gas management system and utilization of gas to energy.
SW4	**Leachate Management** Required for installation and extension of leachate collection, treatment, recirculation network and pump facilities.
SW5	**Drainage & Groundwater Management** Funding for design and installation of surface and groundwater systems, piping, storage and pump stations.
SW6	**Recycling & Waste Management** Facilities and infrastructure to support waste management and recycling including composting, waste separation and diversion, last
SW7	**Landfill Area Development** Required for planning, design and development of areas for filling to maximize available space.
SW8	**Closure & Reclamation** Required for design and construction of final cover system and closure infrastructure and reclamation of disturbed areas to natural state.
SW9	**Solid Waste Renewal** Renewal and replacement of site infrastructure and equipment.

Plan No.	Plan Description	2023	2024	2025	2026	2027	Five-Year Total
SW1	Equipment	400,000	950,000	600,000	650,000	400,000	3,000,000
SW2	Site Improvement	6,202,600	7,600,000	100,000	1,100,000	100,000	15,102,600
SW3	Gas Management	509,800	450,000	450,000	450,000	450,000	2,309,800
SW4	Leachate Management	100,000	200,000	1,000,000	0	0	1,300,000
SW5	Drainage & Groundwater Management	1,130,000	1,400,000	4,900,000	0	500,000	7,930,000
SW6	Recycling & Waste Management	205,900	0	0	300,000	0	505,900
SW7	Landfill Area Development	7,873,000	2,200,000	2,050,000	0	0	12,123,000
SW8	Closure & Reclamation	0	250,000	800,000	0	1,000,000	2,050,000
SW9	Solid Waste Renewal	918,900	460,000	460,000	1,960,000	460,000	4,258,900
		17,340,200	**13,510,000**	**10,360,000**	**4,460,000**	**2,910,000**	**48,580,200**

Funding Sources							
	General Taxation	0	0	0	0	0	0
	Surplus/Reserves	17,134,300	13,110,000	10,360,000	4,460,000	2,910,000	47,974,300
	Development Cost Charges	0	0	0	0	0	0
	Debenture/Borrowing	0	0	0	0	0	0
	Federal/Provincial Funding	0	0	0	0	0	0
	Dev/Comm/Other Contributions	79,700	0	0	0	0	79,700
	Utility Revenue	126,200	400,000	0	0	0	526,200
		17,340,200	**13,510,000**	**10,360,000**	**4,460,000**	**2,910,000**	**48,580,200**

Note: Totals may not add due to rounding.

Storm Drainage Capital

Plan No.	Plan Description

D1 **Hydraulic Upgrading Program**

Estimated expenditures to cover hydraulic improvements to the storm drainage system. This non-exhaustive list of hydraulic capacity projects are selected based on grant availability, contributing area, support by studies, analyses, and/or reoccurring operational issues. Flood protection projects are also included in this category.

D2 **Storm Drainage Quality Program**

This program includes stormwater quality projects that reduce urban and agricultural stormwater pollution throughout the City. Projects are selected based on contemporary water quality monitoring, higher risk subcatchments, and provincial outfall water quality targets. The 2040 Official Community Plan and the draft Area Based Water Management Plan identify relatively high risks and many opportunities for addressing stormwater quality in the City. These projects ultimately support the City's drinking water filtration deferral strategy supported by Interior Health. This category is expected to evolve regularly based on lessons learned, completed projects, and increases to stormwater quality levels of service.

D3 **Storm Water Renewal**

This program provides for the renewal and replacement of pipes, outfalls, pump stations, treatment facilities, and stormwater ponds.

Plan No.	Plan Description	2023	2024	2025	2026	2027	Five-Year Total
D1	Hydraulic Upgrading Program	16,091,300	6,592,623	7,064,195	6,971,863	960,660	37,680,641
D2	Storm Drainage Quality Program	168,400	349,114	120,000	0	0	637,514
D3	Storm Water Renewal	580,500	220,000	340,000	379,152	543,690	2,063,342
		16,840,200	**7,161,737**	**7,524,195**	**7,351,015**	**1,504,350**	**40,381,497**
Funding sources							
	General Taxation	999,800	1,800,490	2,381,598	857,974	837,683	6,877,545
	Surplus/Reserves	10,600,700	3,024,198	2,316,919	3,704,296	394,667	20,040,780
	Development Cost Charges	0	0	0	0	0	0
	Debenture/Borrowing	0	0	0	0	0	0
	Federal/Provincial Funding	4,848,300	2,337,049	2,825,678	2,788,745	272,000	13,071,772
	Dev/Comm/Other Contributions	0	0	0	0	0	0
	Utility Revenue	391,400	0	0	0	0	391,400
		16,840,200	**7,161,737**	**7,524,195**	**7,351,015**	**1,504,350**	**40,381,497**

Note: Totals may not add due to rounding.

Information Services Capital

Plan No.	Plan Description

I1 Front Office Equipment

Information Services have been utilizing a 5 year replacement cycle for desktop equipment which includes computers, printers, monitors, scanners and software. It also includes work group equipment such as large format plotters and copiers.

I2 Server & Data Storage

To provide equipment and software in City Hall data centre to support the various systems in place for staff and includes equipment for the Fire Hall data centre. Included are servers, disk storage, tape backups and the related software.

I3 Major System Projects

Major systems projects include Class Registration Software Replacement and Online Platform Redevelopment.

I4 Communications Systems

To provide a networking environment that interconnects the various places and spaces used by City staff, this budget will support the expansion of the City's fibre optic ring which will reduce need for leased communication lines. Network components that have reached the end of their serviceable life will also be replaced.

Plan No.	Plan Description	2023	2024	2025	2026	2027	Five-Year Total
I1	Front Office Equipment	503,300	454,839	612,108	345,309	320,568	2,236,124
I2	Server & Data Storage	80,000	60,000	53,330	289,180	126,251	608,761
I3	Major System Projects	2,015,900	2,291,114	170,655	258,517	150,726	4,886,912
I4	Communications Systems	1,717,500	186,455	311,082	105,611	196,479	2,517,127
		4,316,700	**2,992,408**	**1,147,175**	**998,617**	**794,024**	**10,248,924**
Funding Sources							
	General Taxation	784,900	1,083,221	1,097,175	948,617	744,024	4,657,937
	Surplus/Reserves	2,074,300	1,859,187	0	0	0	3,933,487
	Development Cost Charges	0	0	0	0	0	0
	Debenture/Borrowing	1,389,600	0	0	0	0	1,389,600
	Federal/Provincial Funding	0	0	0	0	0	0
	Dev/Comm/Other Contributions	50,000	50,000	50,000	50,000	50,000	250,000
	Utility Revenue	17,900	0	0	0	0	17,900
		4,316,700	**2,992,408**	**1,147,175**	**998,617**	**794,024**	**10,248,924**

Note: Totals may not add due to rounding.

Vehicle & Mobile Equipment Capital

Plan	Plan Description
V1	**Additional Vehicles / Equipment** This budget supports the addition of new vehicles and equipment to the corporate fleet in response to increased service demand from population growth or additional services.
V2	**Vehicle / Equipment Renewal** As part of the City's vehicle replacement program, vehicles at the end of their service life cycles are replaced using funds from the equipment replacement reserve. Cars and light trucks have an average design life of 10 years.

Plan No.	Plan Description	2023	2024	2025	2026	2027	Five-Year Total
V1	Additional Vehicles / Equipment	517,000	996,300	1,257,400	1,179,000	887,800	4,837,500
V2	Vehicle / Equipment Renewal	8,206,300	3,550,000	3,910,000	4,100,000	4,290,000	24,056,300
		8,723,300	**4,546,300**	**5,167,400**	**5,279,000**	**5,177,800**	**28,893,800**
Funding Sources							
	General Taxation	109,300	0	0	0	0	109,300
	Surplus/Reserves	7,996,700	4,028,400	4,397,800	4,412,600	4,589,400	25,424,900
	Development Cost Charges	0	0	0	0	0	0
	Debenture/Borrowing	0	0	0	0	0	0
	Federal/Provincial Funding	0	0	0	0	0	0
	Dev/Comm/Other Contributions	0	0	0	0	0	0
	Utility Revenue	617,300	517,900	769,600	866,400	588,400	3,359,600
		8,723,300	**4,546,300**	**5,167,400**	**5,279,000**	**5,177,800**	**28,893,800**

Note: Totals may not add due to rounding.

Fire Capital

Plan No.	Plan Description
F1	**Vehicle / Equipment Renewal** As part of the Fire Departments vehicle/equipment replacement program, vehicles and equipment at the end of their service life cycles are replaced using funds from the Fire Departments equipment replacement reserve.
F2	**Additional Vehicles / Equipment** This budget supports the addition of new vehicles and equipment to the Fire Department in response to increased service demand from population growth.
F3	**Communications Systems** To provide for radio system improvements or replacement, including dispatch requirements.

Plan No.	Plan Description	2023	2024	2025	2026	2027	Five-Year Total
F1	Vehicle / Equipment Renewal	3,166,100	697,546	0	0	3,221,796	7,085,442
F2	Additional Vehicles / Equipment	127,000	91,722	65,341	66,648	67,980	418,691
F3	Communications Systems	634,500	34,500	291,800	85,000	595,000	1,640,800
		3,927,600	**823,768**	**357,141**	**151,648**	**3,884,776**	**9,144,933**

Funding Sources						
General Taxation	0	0	0	0	0	0
Surplus/Reserves	3,927,600	823,768	357,141	151,648	3,884,776	9,144,933
Development Cost Charges	0	0	0	0	0	0
Debenture/Borrowing	0	0	0	0	0	0
Federal/Provincial Funding	0	0	0	0	0	0
Dev/Comm/Other Contributions	0	0	0	0	0	0
Utility Revenue	0	0	0	0	0	0
	3,927,600	**823,768**	**357,141**	**151,648**	**3,884,776**	**9,144,933**

Note: Totals may not add due to rounding.

Capital Summary - Airport & Utility Funds

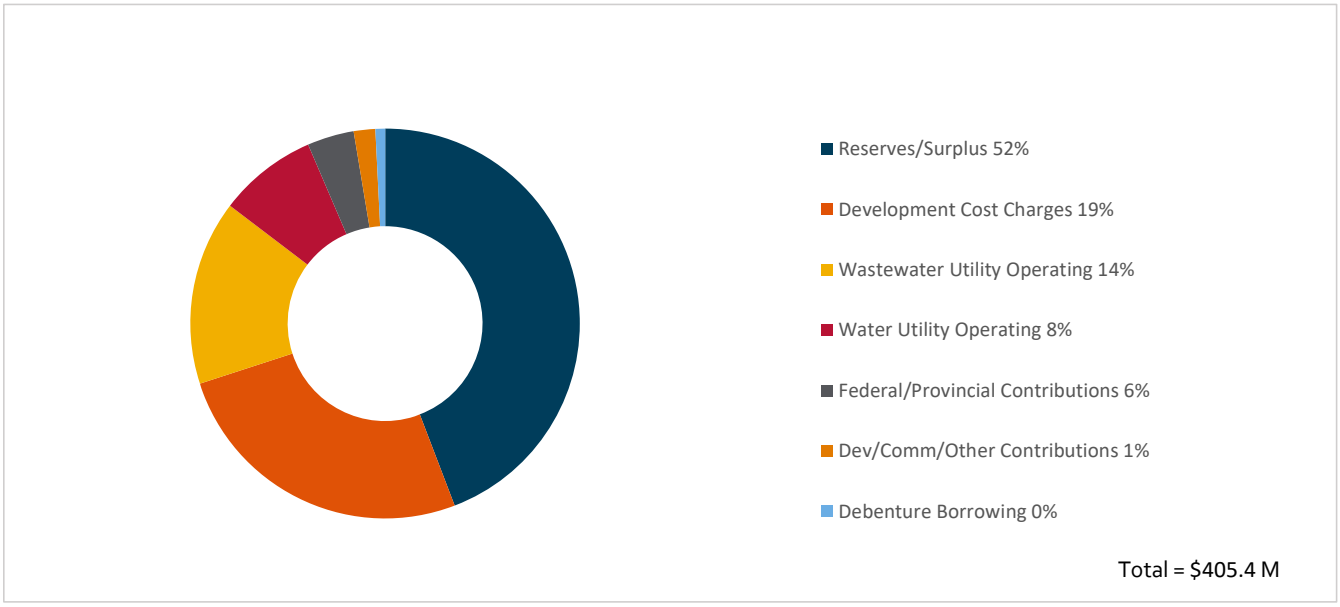
Cost Centre		2023	2024	2025	2026	2027
312	Airport	139,065,000	9,865,400	23,154,600	14,129,200	16,754,500
313	Water	10,501,400	8,013,800	11,229,800	9,142,800	8,713,800
314	Wastewater	31,219,500	10,264,300	25,085,400	26,087,000	62,205,800
		180,785,900	**28,143,500**	**59,469,800**	**49,359,000**	**87,674,100**
Funding Sources:						
	Water Utility Operating	4,360,000	5,684,987	7,404,766	6,566,300	6,491,900
	Wastewater Utility Operating	7,363,700	6,232,160	10,395,440	11,069,800	23,639,400
	Reserves/Surplus	144,404,590	9,865,400	25,154,600	13,607,300	16,003,600
	Development Cost Charges	2,731,710	6,210,953	14,308,994	15,390,700	38,638,300
	Debenture Borrowing	0	0	0	0	0
	Federal/Provincial Contributions	21,105,300	0	0	521,900	2,750,900
	Dev/Comm/Other Contributions	820,600	150,000	2,206,000	2,203,000	150,000
		180,785,900	**28,143,500**	**59,469,800**	**49,359,000**	**87,674,100**
Total Five-Year Capital Program						**405,432,300**

* 10-Year Capital Plan only includes confirmed Federal and Provincial Funding

Note: Totals may not add due to rounding.

Utility Funds Capital Funding 2023 to 2027

The below graph summarizes the overall capital plan funding over the next five years.



Airport Capital

Plan No.	Plan Description
A1	**Airside** Funding for East Lands roads and servicing, stormwater infrastructure, and other small capital projects.
A2	**Groundside** Funding for Airport roadways, hotel and parking development, rental car quick turnaround facility, land purchases, West Lands roads and servicing, and other small capital projects.
A3	**Terminal** Funding for Airport terminal building renovations, technology, bridge upgrades, and other small capital projects.
A4	**Airport Improvement Fees** Funding for the terminal expansion, Apron 1 South expansion, combined operations building, airside pavement rehabilitation, runway end safety area, airside equipment, and other capital projects.

Plan No.	Plan Description	2023	2024	2025	2026	2027	Five-Year Total
A1	Airside	760,000	275,600	827,400	828,300	2,482,900	5,174,200
A2	Groundside	9,249,100	3,376,000	10,795,900	1,291,400	9,464,000	34,176,400
A3	Terminal	6,519,300	1,328,900	1,490,500	1,174,000	762,000	11,274,700
A4	Airport Improvement Fees	122,536,600	4,884,900	10,040,800	10,835,500	4,045,600	152,343,400
		139,065,000	**9,865,400**	**23,154,600**	**14,129,200**	**16,754,500**	**202,968,700**
Funding Sources:							
	General Taxation	0	0	0	0	0	0
	Surplus/Reserves	126,977,000	9,865,400	23,154,600	13,607,300	14,003,600	187,607,900
	Development Cost Charges	0	0	0	0	0	0
	Debenture/Borrowing	0	0	0	0	0	0
	Federal/Provincial Funding	11,806,000	0	0	521,900	2,750,900	15,078,800
	Dev/Comm/Other Contributions	282,000	0	0	0	0	282,000
	Utility Revenue	0	0	0	0	0	0
		139,065,000	**9,865,400**	**23,154,600**	**14,129,200**	**16,754,500**	**202,968,700**

Note: Totals may not add due to rounding.

Water Capital

Plan No.	Plan Description
W1	**DCC Pipes (Mains)**
	New water mains to accommodate growth.
W2	**DCC Booster Stations & PRVs**
	New booster stations &PRV's to accommodate growth.
W3	**DCC Water Treatment**
	New treatment capacity and facilities to accommodate growth.
W4	**DCC Reservoirs & Filling Stations**
	New reservoirs and filling stations to accommodate growth.
W5	**DCC Offsite & Oversize**
	The City's share of costs to oversize water infrastructure and to do work in excess of the developer's own needs.
W6	**Network and Facility Renewal**
	Renewal of existing water mains, booster stations, PRVs, water treatment systems, reservoirs and filling stations that has reached the end of its service life.
W7	**Network and Facility Improvements**
	Network and facility improvements to meet current standards. Contributed assets and water meters that are needed to support development and are funded from development.
W8	**Irrigation Network Improvements**
	Network and Facility Improvements to meet current standards. Fire protection, upper watershed infrastructure, well stations and transmission mains are all included in this irrigation network.

Plan No.	Plan Description	2023	2024	2025	2026	2027	Five-Year Total
W1	DCC Pipes (Mains)	1,401,100	2,750,000	3,221,000	2,579,000	0	9,951,100
W2	DCC Booster Stations & PRVs	0	0	0	0	0	0
W3	DCC Water Treatment	0	0	0	0	0	0
W4	DCC Reservoirs & Filling Stations	231,000	1,900,000	0	0	0	2,131,000
W5	DCC Offsite & Oversize	545,300	143,800	143,800	143,800	143,800	1,120,500
W6	Network and Facility Renewal	5,139,100	3,050,000	4,150,000	4,250,000	5,500,000	22,089,100
W7	Network and Facility Improvements	1,568,800	150,000	2,695,000	150,000	2,150,000	6,713,800
W8	Irrigation Network Improvements	1,616,100	20,000	1,020,000	2,020,000	920,000	5,596,100
		10,501,400	**8,013,800**	**11,229,800**	**9,142,800**	**8,713,800**	**47,601,600**

Funding Sources						
General Taxation	0	0	0	0	0	0
Surplus/Reserves	4,534,490	0	2,000,000	0	2,000,000	8,534,490
Development Cost Charges	1,456,910	2,178,813	1,675,034	2,426,500	71,900	7,809,157
Debenture/Borrowing	0	0	0	0	0	0
Federal/Provincial Funding	0	0	0	0	0	0
Dev/Comm/Other Contributions	150,000	150,000	150,000	150,000	150,000	750,000
Utility Revenue	4,360,000	5,684,987	7,404,766	6,566,300	6,491,900	30,507,953
	10,501,400	**8,013,800**	**11,229,800**	**9,142,800**	**8,713,800**	**47,601,600**

Note: Totals may not add due to rounding.

Wastewater Capital

Plan No.	Plan Description
WW1	**DCC Pipes (Mains)**
	New wastewater mains to support growth.
WW2	**DCC Lift Stations**
	New wastewater lift stations to support growth.
WW3	**DCC Wastewater Treatment Facilities**
	New wastewater treatment facilities to support growth.
WW4	**DCC Oversize**
	The City's share of costs to oversize wastewater infrastructure and to do work in excess of the developer's own needs.
WW5	**Network and Facility Renewal**
	Renewal of existing wastewater mains, lift stations and existing treatment facilities that have reached the end of their service life.
WW6	**Network and Facility Improvements**
	Collection and facility improvements to meet current standards. Contributed assets that are needed to support development and are funded from development.

Plan No.	Plan Description	2023	2024	2025	2026	2027	Five-Year Total
WW1	DCC Pipes (Mains)	535,900	4,823,100	3,354,600	5,654,000	6,265,800	20,633,400
WW2	DCC Lift Stations	2,982,000	221,200	1,990,800	2,053,000	0	7,247,000
WW3	DCC Wastewater Treatment Facilities	434,200	0	14,320,000	12,760,000	50,120,000	77,634,200
WW4	DCC Oversize	538,700	120,000	120,000	120,000	120,000	1,018,700
WW5	Network and Facility Renewal	12,563,200	5,000,000	5,200,000	5,400,000	5,600,000	33,763,200
WW6	Network and Facility Improvements	14,165,500	100,000	100,000	100,000	100,000	14,565,500
		31,219,500	**10,264,300**	**25,085,400**	**26,087,000**	**62,205,800**	**154,862,000**

Funding Sources:						
General Taxation	0	0	0	0	0	0
Surplus/Reserves	12,893,100	0	0	0	0	12,893,100
Development Cost Charges	1,274,800	4,032,140	12,633,960	12,964,200	38,566,400	69,471,500
Debenture/Borrowing	0	0	0	0	0	0
Federal/Provincial Funding	9,299,300	0	0	0	0	9,299,300
Dev/Comm/Other Contributions	388,600	0	2,056,000	2,053,000	0	4,497,600
Utility Revenue	7,363,700	6,232,160	10,395,440	11,069,800	23,639,400	58,700,500
	31,219,500	**10,264,300**	**25,085,400**	**26,087,000**	**62,205,800**	**154,862,000**

Note: Totals may not add due to rounding.

City of Kelowna

2023

FINANCIAL PLAN

Final Budget Volume
Five-Year Financial Plan

April 24, 2023
Council Chambers

#kelownabudget
Kelowna.ca/budget

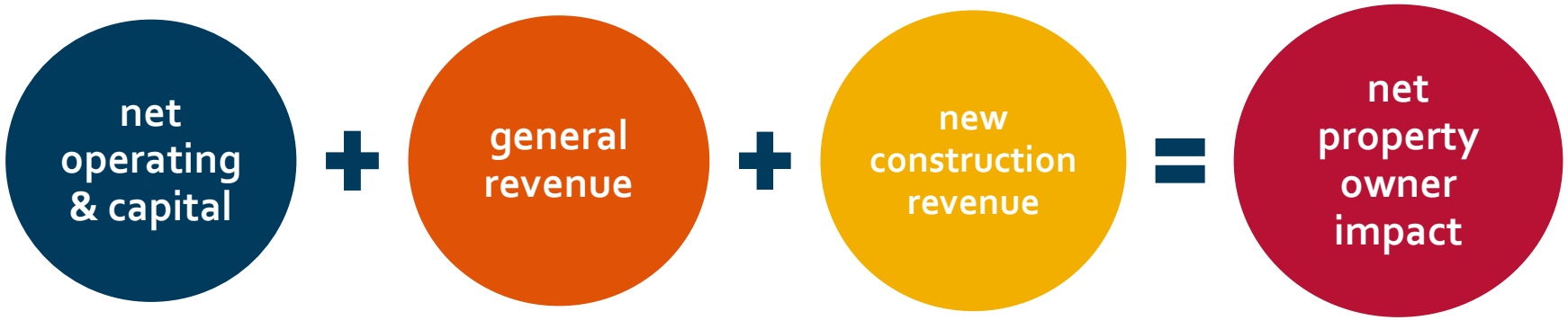
Agenda

- Priorities
- Proposed Final Budget tax demand
- Final Budget Operating requests
- Final Budget Capital requests
- Taxation impacts
- Five-Year Financial Plan (2023- 2027)

2023 Financial Plan – Priorities

- Low tax rate
- Infrastructure for the future
- Community safety
- Social wellness
- Transportation
- Digital transformation
- Protecting our environment

2023 Preliminary Budget Volume



Net Operating + Capital	$190.4M
General revenues	+(15.3)
New Construction Revenue	+(1.7)
2023 Net Tax demand	$173.4M → 3.80%

2023 Final Budget Volume

- Emergent projects
- Required by Legislation
- Council directed

2023 Proposed tax demand

Preliminary gross tax demand	**$175.1M**
Final Budget Volume:	
General revenues	(397k)
Operating requests	765k
Capital requests	1.1M
2023 Final gross tax demand	**$176.6M**
New construction revenue	(3.2M)
Net property owner impact	**3.78%**

Operating Requests – General Fund

Request:	Downtown On Call and Clean Team Support Increase
Justification:	The City of Kelowna works in collaboration with the Downtown Kelowna Business Association to maintain a safe and inviting environment in the downtown core. Budget is requested to increase the support for Downtown On Call and Downtown Clean Team.
Amount:	$54,000
Taxation Impact:	$54,000 Increase to Taxation Demand ongoing

Operating Requests – General Fund

Request:	Insurance Premiums – Inflationary Increase
Justification:	Budget is requested to cover inflationary increases in insurance premiums. Inflation on insurance premium rates in 2023 has been significant worldwide. Property insurance costs in particular increased as a result of higher building replacement costs due to inflation of materials and labour. The City of Kelowna insures $1.1B of built infrastructure with coverage including liability, property, cybercrime and environmental impairment.
Amount:	$161,000
Taxation Impact:	$161,000 Increase to Taxation Demand one-time

Operating Requests – General Fund

Request:	Extreme Weather Response Program Funding
Justification:	Budget is requested for the City of Kelowna to support vulnerable people throughout the community during extreme hot and cold weather events, for which there is no formal program or funding currently in place. These activities are separate from actions taken by the Regional Emergency Program. In 2022 the province formally asked all local governments in BC to work with community partners to have a community plan for heat domes and freezing cold conditions. Staff will monitor for grants and other funding sources as they become available to offset or supplement this funding.
Amount:	$30,000
Taxation Impact:	No Taxation Impact

Operating Requests – General Fund

Request:	Security Services Enhancement - Additional Guard
Justification:	Budget is requested for an additional seasonal security guard to support downtown from April through September. More support is needed to address growing security concerns during the early morning hours. Additional security presence at these times will reduce vandalism and misuse of washrooms amenities as well as improve asset protection. 2023 Base budget: $1.02M
Amount:	$50,000
Taxation Impact:	$50,000 Increase to Taxation Demand ongoing

Operating Requests – General Fund

Request: Transmission of Taxes - BIA's and Other Governments

Justification: To establish the receipt and disbursement of taxes to Business Improvement Areas (BIA) and other taxing authorities (OTA's).

Amount: $133,554,000

Taxation Impact: No Taxation Impact

Operating Requests – General Fund

Request:	FortisBC Operating Fee
Justification:	This request is to adjust the franchise fee revenue due from FortisBC up to $2,157,365 from the 2023 Preliminary budget amount of $1,760,540. The fee is based on 3 per cent of the gross revenue for the provision and distribution of all gas consumed within the City of Kelowna during the 2022 calendar year.
Amount:	$396,800
Taxation Impact:	$396,800 Decrease to Taxation Demand ongoing

Operating Requests – General Fund

Request:	Council Initiatives
Justification:	Kelowna City Council is committed to working closely with residents, community partners and other levels of government to bring positive change. Council priorities and results identify where residents and City Council want to make a difference. Budget is requested for City Council to provide funding to promote and finance various initiatives that will contribute to this change.
Amount:	$500,000
Taxation Impact:	$500,000 Increase to Taxation Demand ongoing

Capital Requests – Building Capital

Request:	H2O Facility Air Handling Renewal
Justification:	Air Handling units at the H2O Adventure & Fitness Centre are approaching the end of their useful life. Immediate service work and replacement is recommended to ensure building operations are not impacted. In consideration of supply chain issues, final work is anticipated into Q2, 2024.
Amount:	$2,500,000
Taxation Impact:	$1,000,000 Increase to Taxation Demand one-time

Capital Requests – Building Capital

Request:	General Building Infrastructure Renewal
Justification:	Budget is requested for general building infrastructure renewal that includes additional budget for the City Hall mechanical upgrade due to equipment cost escalations, and for the modernization of the elevator at the Parkinson Activity Centre. The elevator has had recent frequent maintenance concerns and outages. Contractor investigation identified critical parts are now obsolete requiring modernization to ensure accessibility.
Amount:	$1,050,000
Taxation Impact:	No taxation impact

Capital Requests – Building Capital

Request: City Hall – Level 1 Meeting Room Suite

Justification: The meeting room suite of 4,200sqft on Level 1 of City Hall is complete and will be open shortly for use for City business as well as available for community bookings after hours. In the spirit of reconciliation and recognizing the living history of our region, the rooms are proposed to be given First Nations names, with artwork and decor to honour these names. The name na'?k'?ulam?n generally translates to 'the things that we do'.
The existing capital project is complete, and due to inflationary costs experienced throughout this project, there is no budget remaining for such enhancements. Budget is therefore requested for artwork, decor and specific furniture to create a most meaningful space in the meeting room suite.

Amount: $135,000

Taxation Impact: No taxation impact

Capital Requests – Building Capital

Request:	City Yards – Female Changeroom Upgrades
Justification:	Budget is requested to accommodate the increase of female staff for the Outdoor Operations team at the City Yards facility. The female changeroom facilities have become unsuitably overcrowded for the increased number of female staff. A remodeling of the changeroom and washroom is recommended to increase the area and allow for adequate room for the additional female staff.
Amount:	$130,000
Taxation Impact:	$130,000 Increase to Taxation Demand one-time

Capital Requests – Parks Capital

Request:	City Park – Rose Garden Improvements
Justification:	Budget is requested for a cross-divisional operational initiative to modify existing amenities, with a focus on safety and operational improvements at City Park. Through the improvement of sightlines, and the introduction of new activities to encourage more park users onto the east side of the park, it is expected many of the social issues that occur will be moved from this area.
Amount:	$220,000
Taxation Impact:	No taxation impact

Capital Requests – Parks Capital

Request:	Mission Recreation Park – Modular Park Washroom Unit
Justification:	Budget is requested to purchase, transport and install a new, unused multi-stall parks washroom unit. The unit is proposed to be installed first at Mission Rec Park (MRP) to service the high demand in the southern half of the site. When other permanent washrooms become available at MRP, the unit will be relocated to another high demand location. Cost savings are expected to be realized through the reduction of renting and maintaining of the blue portable toilets.
Amount:	$160,000
Taxation Impact:	No taxation impact

Capital Requests – Water Capital

Request:	Osprey Avenue Watermain
Justification:	Budget is requested to help minimize the overall service disruption to the surrounding Osprey Avenue neighbourhood. The project consists of upgrading the watermain along Osprey Avenue while the sewer project is being constructed as this neighbourhood was approved for intensification. The Water Utility will fund 50 per cent of the project to reflect the advancing of the renewal project, while the remaining 50 percent will be recovered, from development, through future latecomer fees.
Amount:	$300,000 funded from Water reserves
Taxation Impact:	No taxation impact

Taxation Impact - Summary

$1,009,350

Average residential property

$2,373

Municipal portion of taxes

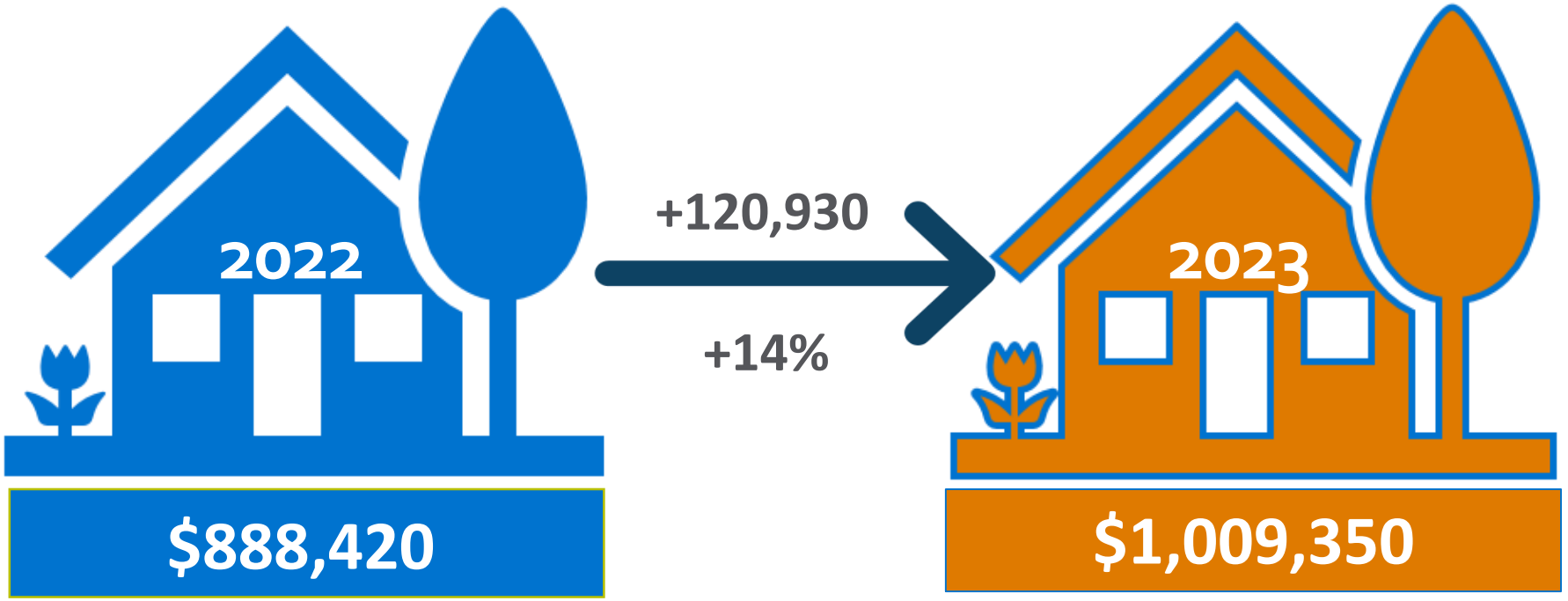
$87

$ Increase from prior year

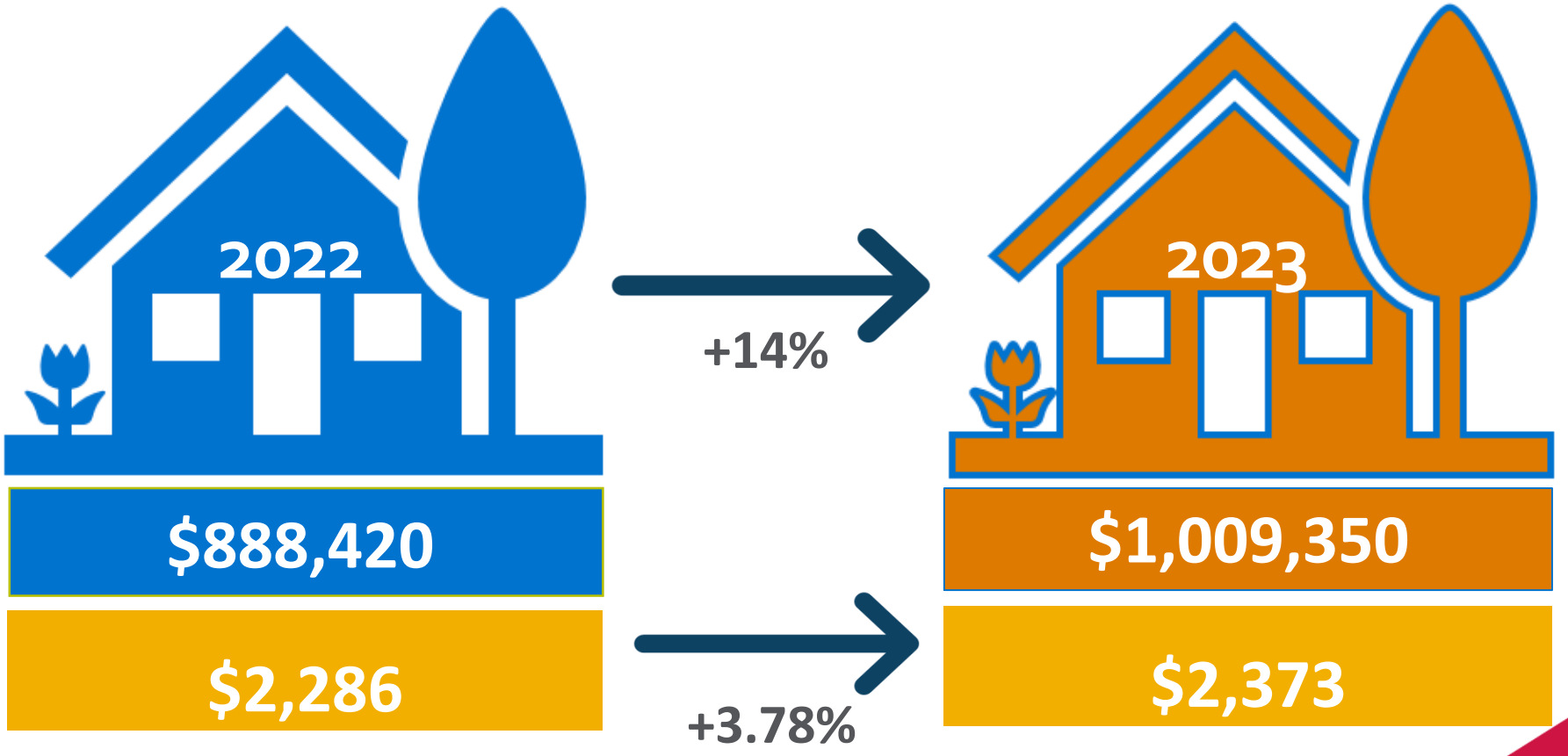
3.78%

% Increase from prior year

2022 to 2023 Average Residential Assessed Value



2023 Average Property Owner Impact



What Do Tax Dollars Pay For:

34% Community Safety

33% Infrastructure

13% Fire Department

10% Planning and Development

5% Other Programs

5% Active Living and Culture

Five-Year Financial Plan

	2023	2024	2025	2026	2027
General revenues	(15,683)	(16,023)	(16,371)	(16,735)	(17,089)
Net operating budget	177,175	188,047	199,214	211,275	222,421
Pay-as-you-go capital	15,132	16,255	17,453	18,727	19,981
Taxation demand	**176,624**	**188,279**	**200,296**	**213,266**	**225,313**
New construction tax revenue	(3,200)	(2,808)	(2,994)	(3,185)	(3,135)
Net property owner impact	**3.78%**	**5.01%**	**4.79%**	**4.89%**	**4.18%**


QUESTIONS?
Budget 2023
#kelownabudget
For more information visit: kelowna.ca/budget
City of
Kelowna

City of Kelowna

2023

FINANCIAL PLAN

Final Budget Volume
Five-Year Financial Plan

April 24, 2023
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CITY OF KELOWNA

BYLAW NO. 12502

Five-Year Financial Plan 2023-2027

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. Schedule "A" attached hereto and forming part of this bylaw is hereby declared to be the Five-Year Financial Plan of the City of Kelowna for the period January 1, 2023 to and including December 31, 2027.

2. Schedule "B" attached hereto and forming part of this bylaw is hereby declared to be the Statement of Objectives and Policies in accordance with Section 165 (3.1) of the *Community Charter*.

3. This bylaw may be cited for all purposes as the "Five-Year Financial Plan Bylaw, 2023-2027, No. 12502".

Read a first, second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

Schedule "A"
Financial Plan 2023 - 2027

	2023	2024	2025	2026	2027	2028-2030
Revenue						
Property Value Tax	176,624,339	188,279,055	200,295,838	213,266,188	225,313,048	723,943,923
Library Requisition	7,325,200	7,471,704	7,621,138	7,773,561	7,929,032	24,751,330
Parcel Taxes	3,433,673	3,386,926	3,226,092	2,878,729	2,643,767	7,706,257
Fees and Charges	166,752,954	168,998,093	176,296,845	181,604,696	185,477,990	607,768,371
Borrowing Proceeds	8,507,400	161,039,504	50,989,600	0	0	6,321,200
Other Sources	90,079,744	64,924,162	68,236,877	65,808,081	64,104,429	192,860,588
	452,723,310	594,099,445	506,666,391	471,331,255	485,468,266	1,563,351,669
Transfer between Funds						
Reserve Funds	2,399,489	1,803,987	4,018,987	5,018,987	5,018,987	4,271,961
DCC Funds	55,191,710	27,879,895	45,071,243	42,110,785	72,931,463	131,287,135
Surplus/Reserve Accounts	269,856,570	73,537,991	74,663,418	52,310,615	67,176,349	243,984,608
	327,447,769	103,221,873	123,753,649	99,440,388	145,126,799	379,543,705
Total Revenues	780,171,079	697,321,318	630,420,039	570,771,643	630,595,065	1,942,895,374
Expenditures						
Municipal Debt						
Debt Interest	3,980,837	5,854,736	10,057,004	13,579,814	15,783,808	46,825,315
Debt Principal	6,918,584	7,140,895	9,295,237	13,569,554	14,561,097	43,009,316
Capital Expenditures	367,208,100	288,733,676	204,324,905	129,728,128	173,098,283	427,984,615
Other Municipal Purposes						
General Government	38,935,773	44,982,463	47,990,399	51,232,650	54,614,371	185,472,621
Planning, Development & Building Services	35,969,865	29,502,083	29,279,911	30,240,946	31,205,486	99,725,484
Community Services	102,941,048	105,058,206	108,811,337	112,228,174	115,657,991	368,692,809
Protective Services	94,492,441	88,067,171	91,149,022	94,369,042	97,594,381	313,263,910
Utilities	27,894,607	26,681,298	27,473,602	28,278,225	28,981,397	92,258,679
Airport	22,666,780	23,045,145	24,379,339	26,662,772	27,403,596	86,108,813
	701,008,035	619,065,673	552,760,756	499,889,305	558,900,411	1,663,341,561
Transfers between Funds						
Reserve Funds	31,694,307	31,556,581	32,324,994	32,376,236	32,439,085	97,164,211
DCC Funds	0	0	0	0	0	0
Surplus/Reserve Accounts	47,468,737	46,699,064	45,334,289	38,506,102	39,255,570	182,389,601
	79,163,044	78,255,645	77,659,283	70,882,338	71,694,655	279,553,812
Total Expenditures	780,171,079	697,321,318	630,420,039	570,771,643	630,595,065	1,942,895,374

Note: Totals may not add due to rounding.

Schedule "B"
Statement of Objectives and Policies

In accordance with Section 165(3.1) of the *Community Charter*, municipalities are required to include in the Five-Year Financial Plan, objectives and policies regarding each of the following:

(a) For each of the funding sources described in Section 165(7) of the *Community Charter*, the proportion of total revenue that is proposed to come from that funding source;
(b) The distribution of property value taxes among the property classes that may be subject to taxes;
(c) The use of permissive tax exemptions.

Funding Sources

Table 1 shows the proportion of total revenue proposed to be raised from each funding source in 2023. Property taxes and fees and charges are two of the largest sources of revenue. Both have advantages in that they are stable, relatively simple to administer and are generally understood by citizens. The City of Kelowna also utilizes funds from reserves and surplus as another main source of financial support. Reserve funds are closely managed to ensure and protect the current and future financial viability of the municipality. Other sources of revenue may be variable and fluctuate from year to year depending on the economic influences and capital programs undertaken by the City.

Objectives

- Investigate other potential funding sources and securing opportunities for additional revenues.
- Begin to decrease the municipality's reliance on property taxes and explore opportunities to increase the percent of total revenue received from user fees and charges and senior government grants.
- Maintain a fees and charges structure whereby increases are applied on a regular basis in line with inflation, while ensuring that service levels remain competitive and affordable.

Policies

- Pursue non-property tax revenues whenever possible through applying for government grants and charging user fees at appropriate levels.
- Perform regular reviews of revenue generating areas for appropriate application of rate increases.
    - Planning and Development Fees.
    - Active Living & Culture Fees and Charges – application of BC Consumer Price Index.
    - Utility Revenues – ensure Utilities operate as self-supporting enterprise funds.
- Increase provincial and federal grant revenue through maximum utilization of the City's Grant Manager position.

Table 1: Sources of Revenue

Revenue Source	Revenue $ (000's)	% of Revenue
Property Value Tax	176,624	23%
Library Requisition	7,325	1%
Parcel Taxes	3,434	1%
Fees and Charges	166,753	21%
Borrowing Proceeds	8,507	1%
Other Sources	90,080	11%
Reserve Funds/Accounts	327,448	42%
Total	**780,171**	**100%**

Distribution of Property Tax Rates

Table 2 outlines the council approved municipal tax distribution policy for 2023 and the relative proportion of tax revenues. Projected revenues from the combined residential, recreational and Non-Profit classes, provides the largest proportion of property tax revenue. This cumulative class represents the largest tax assessment base and hence utilizes the majority of City services.

Objectives

- Provide an effective tax change that is the same for all property classes.
- Ensure that business and light industry property tax ratios remain below the average of BC municipalities with populations greater than 75,000.
- Allow for a maximum ratio cap of 3:1 for the Light Industrial/Business class.

Policies

- Council will annually review and modify tax class ratios to provide an effective tax change that is the same for all classes.
- The impacts on other property classes from administering a ratio cap on the Light Industrial/Business classes will be reported to Council during the annual Tax Distribution Policy review.
- Regularly review and compare the City's relative position in terms of distribution of taxes to other similarly sized municipalities in British Columbia.

Table 2: Tax Class Ratios and Projected Revenues

Property Class	Description	2023 Tax Class Ratios	Tax Revenue $ (000's)	2022 Tax Class Ratios
01/08/03	Res/Rec/NP/SH	1.0000:1	123,529	1.0000:1
02	Utilities	5.7720:1	788	6.0783:1
04	Major Industrial	8.5581:1	0	7.5328:1
05/06	Light Ind/Bus/Other	2.4594:1	51,603	2.5451:1
09	Farm Land	0.2307:1	12	0.2052:1
91	Farm Improvements	0.5149:1	692	0.4905:1
	Total Revenues		**176,624**	

Property Tax Exemptions

The City has an existing permissive tax exemption policy which guides the administration and approval of permissive tax exemptions. Some of the eligibility criteria for permissive tax exemptions that are outlined in the policy include the following:

- The applicant must qualify for an exemption under the provisions of the Community Charter.
- The organization receiving an exemption must be a registered non-profit society or registered charity, as the support of the municipality will not be used for commercial and private gain.
- The tax exemption must demonstrate benefit to the community and residents of the City by enhancing the quality of life (spiritually, educationally, socially and culturally), while delivering services economically to the citizens within the community.

The value of tax exemptions provided by Council for 2023 (based on 2022 assessment totals and tax rates) is $3,866,297. The following breaks down the total into various exemption categories and the exemption value for the category:

Places of Worship - $ 324,543
Private schools - $ 77,641
Hospitals - $ 16,239
Special Needs Housing - $ 70,002
Social Services - $ 344,793
Public Park, Athletic or Recreational - $ 414,701
Cultural - $ 455,857
Partnering, Heritage or Other Special Exemptions Authority - $ 376,521
Revitalization - $1,786,000

In order to encourage the restoration and preservation of commercial, industrial and institutional building, properties that meet the criteria outlined in the Heritage Building Tax Incentive Program policy can receive a tax exemption.

The establishment of the Revitalization Tax Exemption policy allows qualifying properties within the Downtown Urban Centre and Rutland Urban Centre areas to receive a tax exemption.

<u>Objectives</u>

- Continue to provide permissive tax exemptions to support qualifying organizations that improve the well-being of the community.
- The municipality will continue to provide heritage and revitalization tax exemptions for qualifying properties.

<u>Policies</u>

- Permissive tax exemptions will be considered to encourage activities that: (a) are consistent with the quality of life objectives of the municipality; (b) provide direct access and benefit to the public; and (c) would otherwise be provided by the municipality.

- To meet the city's commitment to the ongoing restoration, preservation and maintenance of buildings and structures on its Heritage Register, eligible properties will be considered for a tax exemption.
- To support the city's revitalization program of the Downtown Urban Centre and Rutland Urban Centre, qualifying properties will be considered for a tax exemption.

CITY OF KELOWNA

BYLAW NO. 12503

Tax Structure Bylaw, 2023

WHEREAS the Letters Patent of the City of Kelowna provide that the municipality may be divided into two (2) or more taxation areas by bylaw adopted prior to the adoption of the Annual Budget Bylaw;

NOW THEREFORE, the Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. **Taxation Area 1**

   All lands and improvement thereon classified for assessment purposes as "Farm".

2. **Taxation Area 2**

   All lands and improvements thereon not included in Taxation Area 1.

3. This bylaw shall be applicable for the 2023 taxation year.

4. This bylaw may be cited for all purposes as "Tax Structure Bylaw, 2023 No. 12503".

Read a first, second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

CITY OF KELOWNA

BYLAW NO. 12504

Annual Tax Rates Bylaw, 2023

WHEREAS the Letters Patent dated the Twenty-fifth day of April, 1973 for the City of Kelowna provides for differing levels of taxation taking into consideration the extent of level of services being provided to different areas within the municipality.

The Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. The following rates are hereby imposed and levied for the taxation year 2023:

   (a) For all lawful General purposes of the municipality on the assessed value of land and improvements taxable for general municipal purposes, rates appearing in column "A" of Schedule 1 of this Bylaw;

   (b) For Debt purposes on the assessed value of land and improvements taxable for general municipal purposes, rates appearing in column "B" of Schedule 1 of this Bylaw;

   (c) For purposes of the Okanagan Regional Library on the assessed value of land and improvements taxable for Regional Library purposes, rates appearing in column "C" of Schedule 1 of this Bylaw;

   (d) For Hospital purposes on the assessed value of land and improvements taxable for Regional Hospital District purposes, rates appearing in column "D" of Schedule 1 of this Bylaw;

   (e) For purposes of the Regional District of Central Okanagan on the assessed value of land and improvements taxable for Regional District purposes, rates appearing in column "E" of Schedule 1 of this Bylaw;

   (f) For purposes of the Regional District of Central Okanagan on the assessed value of land only for the Regional District of Central Okanagan Sterile Insect Release Program, rates appearing in column "F" of Schedule 1 of this Bylaw; and

   (g) For Local Service Area purposes on the assessed value of land and improvements taxable for general municipal purposes, rates appearing in columns "A" and "B" of Schedule 2 of this Bylaw.

2. This bylaw may be cited as "Annual Tax Rates Bylaw, 2023 No. 12504".

Read a first, second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

SCHEDULE 1

CITY OF KELOWNA

GENERAL MUNICIPAL, DEBT, HOSPITAL AND REGIONAL DISTRICT TAX RATES - 2023

		TAX RATES (DOLLAR OF TAX PER $1,000 TAXABLE VALUE)					TAXABE LAND ONLY
		A	B	C	D	E	F
PROPERTY CLASS		GENERAL MUNICIPAL	DEBT	LIBRARY	REGIONAL HOSPITAL DISTRICT	REGIONAL DISTRICT	REGIONAL DISTRICT SIR
01	Residential	2.2744	0.0759	0.0973	0.1908	0.1924	0.0184
02	Utilities	13.1280	0.4379	0.5617	0.6678	0.6735	0.0644
03	Supportive Housing	2.2744	0.0759	0.0973	0.1908	0.1924	0.0184
04	Major Industrial	19.4647	0.6492	0.8328	0.6487	0.6543	0.0625
05	Light Industrial	5.5936	0.1866	0.2393	0.6487	0.6543	0.0625
06	Business/Other	5.5936	0.1866	0.2393	0.4674	0.4715	0.0451
08	Recreation/Non-Profit	2.2744	0.0759	0.0973	0.1908	0.1924	0.0184
09	Farm:						
	a) Land	0.5100	0.0175	0.0225	0.1908	0.1924	0.0184
	b) Improvements	1.1711	0.0391	0.0501	0.0000	0.0000	0.0000

SCHEDULE 2

CITY OF KELOWNA

2023 LOCAL SERVICE AREA TAX RATES

PROPERTY CLASS	A DOWNTOWN BUSINESS IMPROVEMENT AREA	B UPTOWN RUTLAND BUSINESS IMPROVEMENT AREA
1. RESIDENTIAL	0	0
2. UTILITY	0	0
4. INDUSTRIAL – MAJOR	0	0
5. INDUSTRIAL – LIGHT	1.0215	0.9293
6. BUSINESS	1.0215	0.9293
7. TREE FARM	0	0
8. SEASONAL	0	0
9. FARM a) LAND b) IMPROVEMENT	 0 0	 0 0

CITY OF KELOWNA

BYLAW NO. 12505

Development Cost Charge Reserve Fund Expenditure Bylaw, 2023

WHEREAS, there is an unappropriated balance in the Development Cost Charge Reserve Fund of One Hundred and Forty Eight Million, One Hundred and Forty Thousand, Five Hundred and Sixty Five dollars ($ 148,140,565) as at January 1, 2023.

AND WHEREAS, it is deemed desirable to expend a portion of the monies set aside under said Development Cost Charge Reserve Fund for the purpose of utility, road and land improvement and additions;

NOW THEREFORE, the Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. The sum of One Hundred and Forty Eight Million, One Hundred and Forty Thousand, Five Hundred and Sixty Five dollars ($ 148,140,565) is hereby appropriated from the Development Cost Charge Reserve Fund to be expended in 2023 for the following purposes:

Land for Park Purposes	$ 24,397,439
Park Development	$17,428,958
Road Construction	$ 86,380,320
Wastewater Trunks, Plant & Debt Repayment	$ 2,819,267
Water Mains, Pump Stations & Reservoir Construction	$ 17,111,398
Drainage	$3,183
	$ 148,140,565

2. The expenditure to be carried out by the monies hereby appropriated shall be more particularly specified and authorized by resolution of Council.

3. Should any of the above remain unexpended after the expenditures hereby authorized have been made, the unexpended balance shall be returned to the credit of the Development Cost Charge Reserve Fund.

4. This bylaw may be cited as the "Development Cost Charge Reserve Fund Expenditure Bylaw, 2023, No. 12505".

Read a first, second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

CITY OF KELOWNA

BYLAW NO. 12506

Sale of City-Owned Land Reserve Fund Expenditure Bylaw, 2023

WHEREAS, there is an unappropriated balance in the Sale of City-Owned Land Reserve Fund of Ten Million, Nine Hundred Thirty Four Thousand, One Hundred Fifty Dollars ($10,934,150) as at January 1, 2023.

AND WHEREAS, it is deemed desirable to expend a portion of the monies set aside under said Sale of City-Owned Land Reserve Fund for the purpose of land purchases and enhancements set out below;

NOW THEREFORE, the Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. The sum of Ten Million, Nine Hundred Thirty Four Thousand, One Hundred Fifty Dollars ($10,934,150) as at January 1, 2023 is hereby appropriated from the Sale of City-Owned Land Reserve Fund to be expended in 2023 for the following purposes:

General Land	$ 5,548,575
Parks Land	$ 1,590,808
Housing Opportunity	$ 3,794,767
	$ 10,934,150

2. The expenditure to be carried out by the monies hereby appropriated shall be more particularly specified and authorized by resolution of Council.

3. Should any of the above remain unexpended after the expenditures hereby authorized have been made, the unexpended balance shall be returned to the credit of the City-Owned Land Reserve Fund.

4. This bylaw may be cited as the "Sale of City-Owned Land Reserve Fund Expenditure Bylaw, 2023, No. 12506".

Read a first, second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

CITY OF KELOWNA

BYLAW NO. 12508

Septic Removal Specific Area Reserve Fund Expenditure Bylaw, 2023

WHEREAS, there is an unappropriated balance in the Septic Removal Specific Area Reserve Fund of Six Million, Eight Hundred and Eighty Eight thousand, Six Hundred and Twenty One ($6,882,621), as at January 1, 2023.

AND WHEREAS, it is deemed desirable to expend a portion of the monies set aside under said Septic Removal Specific Area Reserve Fund for the purpose of septic removal and enhancements set out below;

NOW THEREFORE, the Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. The sum of Six Million, Eight Hundred and Eighty Eight thousand, Six Hundred and Twenty One ($6,882,621), as at January 1, 2023 is hereby appropriated from the Septic Removal Specific Area Reserve Fund to be expended in 2023 for the following purposes:

Septic Removal	$6,882,621

2. The expenditure to be carried out by the monies hereby appropriated shall be more particularly specified and authorized by resolution of Council.

3. Should any of the above remain unexpended after the expenditures hereby authorized have been made, the unexpended balance shall be returned to the credit of the Septic Removal Specific Area Reserve Fund

4. This bylaw may be cited as the " Septic Removal Specific Area Reserve Fund Expenditure Bylaw, 2023, No. 12508".

Read a first, second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

Report to Council

Date:	April 24, 2023
To:	Council
From:	City Manager
Subject:	2023 Sterile Insect Release (SIR) parcel tax
Department:	Financial Services - Controller

Recommendation:

THAT Council approve the Sterile Insect Release Program as outlined in the report of the Revenue Supervisor dated April 24, 2023, charging the 2023 Sterile Insect Release (SIR) Parcel Tax to individual property tax rolls in accordance with the 2023 SIR Parcel Tax Assessment Roll provided to the City of Kelowna by SIR administration.

AND THAT Bylaw No. 12516 being the Sterile Insect Release Program Parcel Tax Bylaw 2023 be forwarded for reading consideration.

Purpose:

To authorize the 2023 Sterile Insect Release parcel tax levy on specified property tax rolls within the City of Kelowna.

Background:

The SIR Program is an area wide codling moth management program operating in key growing areas of the Okanagan, Similkameen and Shuswap Valleys, in commercial orchards and urban areas. The SIR Board governs the service provided through bylaws of the Okanagan Similkameen, Central Okanagan, North Okanagan, and Columbia Shuswap Regional Districts. Funding is requisitioned through a land value tax paid by all property owners in the service area and a parcel tax levied against planted host tree acreage. The SIR Program provides enforcement of area wide management and control of codling moth infestation as well as the rearing and releasing of sterile codling moths throughout orchards. This environmentally friendly technique reduces the need for reliance on pesticides. Sterile insect technology allows for greater opportunities for sustainable agricultural practices such as integrated pest management controls of orchard pests. A reduction in chemical sprays benefits the entire community through less environmental impact to the air, water and soil quality, benefiting public health as well as producing quality fruit.

The program consists of two separate levies. The first levy is based on the assessed value of the land and a tax rate for each class of property (residential, utility, major and light industrial, recreational, business, and farm land), and is provided by the Regional District of Central Okanagan. It applies, generally, to all property tax rolls within the City of Kelowna.

The second levy is a parcel tax applicable to all properties that are 0.30 acres or more and contain 20 or more codling moth host trees (apple, pear, crab apple, and quince). The 2023 charge of $156.42 per assessed acre will be applied to all property tax rolls on the list provided by SIR administration and are attached to Bylaw 12516.

The following chart lists the historical annual budget figures levied on property within the City of Kelowna as well as the year over year percentage change.

	2019	2020	2021	2022	2023
General Levy on All Properties	$744,305	$747,829	$734,153	$745,361	$763,154
Percentage Change from Prior Year	0.79%	0.47%	-1.83%	1.53%	2.39%
Parcel Tax Levy	$307,121	$292,855	274,229	$276,676	$274,968
Percentage Change from Prior Year	-3.75%	-4.65%	-6.36%	0.89%	-0.62%
Per Acre Charge for Parcel Tax	$139.26	$139.26	$139.26	$150.40	$156.42
Percentage Change from Prior Year	0.00%	0.00%	0.00%	8.00%	4.00%

Internal Circulation:

Office of the City Clerk

Considerations applicable to this report:

Legal/Statutory Authority:

Section 200 of the Community Charter provides that Council may, by bylaw, impose a parcel tax in accordance with Part 7 Division 4 – Parcel Taxes to provide all or part of the funding for a service.

Financial/Budgetary Considerations:

While the SIR program is run across the 4 participating regional districts, each municipality has tax authority over their own specific area. Each municipality collects the parcel tax and then passes on the funds to the Regional District, who then uses the funds to pay for the SIR Program.

Considerations not applicable to this report:
Legal/Statutory Procedural Requirements:
Existing Policy:
External Agency/Public Comments:
Communications Comments:

Submitted by:

Patrick Gramiak, Revenue Supervisor

Approved for inclusion: Joe Sass, Finance Director, Financial Services

City of Kelowna

Sterile Insect Release (SIR) Program 2023

SIR Program

- The Central Okanagan joined the SIR program in 2002
- Current participants include the Okanagan Similkameen, Central and North Okanagan and the Columbia Shuswap region
- It's a codling moth management program that is environmentally friendly and controls the risk of codling moth infestation in commercial orchards and urban areas
- SIR board is requesting a tax levy of $1,038,122 to cover the 2023 program budget

Part 1: Levy on Land Only

- A general levy of 0.0229 cents per thousand of assessed value of land on all classes.
  - For example: $2.29 would be levied on land that is assessed at $100,000

Part 2: Levy on Parcels

- All parcels of land that are **0.3** acres or more and contain 20 or more codling moth host trees are charged $156.42 per assessed acre.
- Bylaw 12516 adjusts the Parcel Tax levy for 2023

City of Kelowna

Questions?

For more information, visit **kelowna.ca**.

CITY OF KELOWNA

BYLAW NO. 12516

Sterile Insect Release Program Parcel Tax Bylaw 2023

A bylaw pursuant to Section 200 of the *Community Charter* to impose and levy a Parcel Tax upon the owners of land or real property within the City of Kelowna being served by the Sterile Insect Release Program.

NOW THEREFORE, the Municipal Council of the City of Kelowna, in open meeting assembled, enact as follows:

1. A Parcel Tax shall be and is hereby imposed and levied upon the owners of land or real property as shown on Schedule "A" attached to and forming part of this bylaw, being served by the Sterile Insect Release Program.

2. The Parcel Tax shall be levied for the 2023 tax year on each parcel of land aforementioned, and the amount of such Parcel Tax shall be One Hundred and Fifty Six Dollars and Forty Two Cents ($156.42) per assessed acre.

3. This bylaw shall be known for all purposes as the "Sterile Insect Release Program Parcel Tax Bylaw 2023 No. 12516".

Read a first, second and third time and adopted by the Municipal Council this 24th day of April, 2023.

_____
Mayor

_____
City Clerk

Schedule A

Regional District of Central Okanagan | 2023 OKSIR PARCEL TAX ROLL | Jurisdiction 217

Folio	Property Address	Legal Description	Adjusted Acres	x$156.42
21703108010	1355 LATTA, KELOWNA	LOT 10, PLAN KAP1611, SECTION 1, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 39146	**6.26**	**$979.19**
21703121000	2355 MCKENZIE, KELOWNA	LOT A, PLAN KAP15859, SECTION 1, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**3.04**	**$475.52**
21703121010	2295 MCKENZIE, KELOWNA	LOT 2, PLAN KAP33255, SECTION 1, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**11.03**	**$1,725.31**
21703205000	2635 SEXSMITH, KELOWNA	LOT 1, PLAN KAP12772, SECTION 3&33, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, & TWP 26	**8.01**	**$1,252.92**
21703210125	2517 SEXSMITH, KELOWNA	LOT 10, PLAN KAP21431, SECTION 3&4, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**6.84**	**$1,069.91**
21703210210	705 VALLEY, KELOWNA	LOT B, PLAN KAP31659, SECTION 3, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**4.97**	**$777.41**
21703236002	770 PACKINGHOUSE, KELOWNA	LOT 1, PLAN EPP68383, SECTION 3,4,9, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**1.13**	**$176.75**
21703245000	590 BRENDA, KELOWNA	LOT 25, BLOCK 5, PLAN KAP896, SECTION 4&9, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**4.85**	**$758.64**
21703255321	1982 UNION, KELOWNA	LOT A, PLAN KAP75150, SECTION 4, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21703255322	1980 UNION, KELOWNA	LOT B, PLAN KAP75150, SECTION 4, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21703262000	2389 LONGHILL, KELOWNA	LOT 13, BLOCK 9, PLAN KAP1068, SECTION 4, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, & SEC 33 TWP 26	**6.29**	**$983.88**
21703263000	2206 LONGHILL, KELOWNA	LOT 2, BLOCK 17, PLAN KAP1068, SECTION 4&34, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, & TWP 26	**7.33**	**$1,146.56**
21703264000	185 VALLEY, KELOWNA	LOT 3, BLOCK 17, PLAN KAP1068, SECTION 4&34, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, & TWP 26	**3.77**	**$589.70**
21703266000	143 VALLEY, KELOWNA	LOT 5, BLOCK 17, PLAN KAP1068, SECTION 4, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 20854	**3.84**	**$600.65**
21703267000	1 - 127 VALLEY, KELOWNA	LOT 6, BLOCK 17, PLAN KAP1068, SECTION 4, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**9.27**	**$1,450.01**
21703268000	2214 BONN, KELOWNA	LOT 7, BLOCK 17, PLAN KAP1068, SECTION 4, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 22394	**4.51**	**$705.45**
21703269000	115 VALLEY, KELOWNA	LOT 8, BLOCK 17, PLAN KAP1068, SECTION 4, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**10.16**	**$1,589.23**
21703271000	220 MAIL, KELOWNA	LOT 12, BLOCK 17, PLAN KAP1068, SECTION 4, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**8.45**	**$1,321.75**
21703272000	180 MAIL, KELOWNA	LOT 13, BLOCK 17, PLAN KAP1068, SECTION 4, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**6.16**	**$963.55**
21703274000	135 VALLEY, KELOWNA	LOT H, PLAN KAP1636, SECTION 4, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN H8323	**3.80**	**$594.40**
21703278000	800 PACKINGHOUSE, KELOWNA	LOT 3, PLAN KAP1884, SECTION 4&9, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21703279000	2160 SCENIC, KELOWNA	LOT 4, PLAN KAP1884, SECTION 4&9, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, AMD LOT (DD 79128F)	**2.94**	**$459.87**

21703410000	1250 GLENMORE, KELOWNA	LOT 1, BLOCK 11, PLAN KAP1068, SECTION 9, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP85917	**2.24**	**$350.38**
21703411000	1 - 1340 GLENMORE, KELOWNA	LOT 2, BLOCK 11, PLAN KAP1068, SECTION 9, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP85919, MANUFACTURED HOME REG.# 40311, BAY # 1	**1.00**	**$156.42**
21703645000	2434 GALE, KELOWNA	LOT 2, PLAN KAP1453, SECTION 23, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**1.77**	**$276.86**
21703664000	2155 PIER MAC, KELOWNA	LOT 1, PLAN KAP2257, SECTION 23, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**2.34**	**$366.02**
21703664514	2855 DRY VALLEY, KELOWNA	LOT A, PLAN KAP37471, SECTION 23, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, MOBILE ON GALE RD, MANUFACTURED HOME REG.# 4566	**3.56**	**$556.86**
21703664516	2849 DRY VALLEY, KELOWNA	LOT B, PLAN KAP37471, SECTION 23, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT	**10.66**	**$1,667.44**
21703884000	3310 MATHEWS, KELOWNA	LOT 63, PLAN KAP1247, SECTION 3&34, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, & TWP 29	**5.56**	**$869.70**
21703905104	4236 SPIERS, KELOWNA	LOT B, PLAN KAP92871, SECTION 3, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.44**	**$694.50**
21703906000	4233 SPIERS, KELOWNA	LOT 119, PLAN KAP1247, SECTION 3, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN A1060	**1.13**	**$176.75**
21703907000	4221 SPIERS, KELOWNA	LOT 120, PLAN KAP1247, SECTION 3, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# 72661	**11.20**	**$1,751.90**
21703908000	4215 SPIERS, KELOWNA	LOT 121, PLAN KAP1247, SECTION 3, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21703912000	3030 GRIEVE, KELOWNA	LOT 125, PLAN KAP1247, SECTION 3, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# B13027	**5.50**	**$860.31**
21703913001	3015 GRIEVE, KELOWNA	LOT 126, PLAN KAP1247, SECTION 3, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# 068492	**6.53**	**$1,021.42**
21703913100	3145 GULLEY, KELOWNA	LOT 127, PLAN KAP1247, SECTION 3, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**8.42**	**$1,317.06**
21703949320	4280 SPIERS, KELOWNA	LOT B, PLAN KAP34609, SECTION 3, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**8.63**	**$1,349.90**
21703949340	4207 SPIERS, KELOWNA	LOT B, PLAN KAP47098, SECTION 3, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.07**	**$480.21**
21703949390	3480 WATER, KELOWNA	LOT A, PLAN KAP71707, SECTION 3, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.16**	**$650.71**
21703950000	3965 TODD, KELOWNA	PARCEL B, PLAN KAP1247, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP44155, ASSIGNED PCL B (D.D.191005F) OF L 154	**8.67**	**$1,356.16**
21703952062	3865 SPIERS, KELOWNA	LOT 138, PLAN KAP1247, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN H15296 & 39975	**6.75**	**$1,055.84**
21703956000	4201 SPIERS, KELOWNA	LOT 142, PLAN KAP1247, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**6.18**	**$966.68**
21703960000	2699 SAUCIER, KELOWNA	LOT 145, PLAN KAP1247, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EX W 320 FT	**1.35**	**$211.17**
21703965000	4175 TODD, KELOWNA	LOT 150, PLAN KAP1247, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, & OF W 1/2 OF SEC 33	**4.98**	**$778.97**
21703968000	4067 TODD, KELOWNA	LOT 153, PLAN KAP1247, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.70**	**$735.17**
21703971501	2177 WARD, KELOWNA	LOT 157, PLAN KAP1247, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP78689, KAP88849	**1.25**	**$195.53**
21703971503	2287 WARD, KELOWNA	LOT B, PLAN KAP78689, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP88849	**35.85**	**$5,607.66**
21703971504	3974 TODD, KELOWNA	LOT 1, PLAN KAP88849, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.23**	**$192.40**

21703973000	3980 TODD, KELOWNA	LOT 159, PLAN KAP1247, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.41**	**$376.97**
21703979000	2715 HEWLETT, KELOWNA	LOT 3, PLAN KAP1656, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B7338	**8.30**	**$1,298.29**
21703981000	2570 SAUCIER, KELOWNA	PARCEL A, PLAN KAP6018B, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, PCL A OF L 1 PL 1656 S/O PL B6018 (DD 127007F)	**1.18**	**$184.58**
21703985000	2675 HEWLETT, KELOWNA	LOT A, PLAN KAP12142, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.83**	**$755.51**
21703990002	3950 SPIERS, KELOWNA	LOT E, PLAN KAP12142, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 27157 28923 KAP65455	**1.37**	**$214.30**
21703995027	3920 TODD, KELOWNA	LOT B, PLAN KAP21140, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21703995159	3955 SPIERS, KELOWNA	LOT A, PLAN KAP56989, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.40**	**$218.99**
21703995172	2620 HEWLETT, KELOWNA	LOT 2, PLAN KAP92520, SECTION 4, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**14.25**	**$2,228.99**
21703997000	4200 STEWART, KELOWNA	LOT 237, PLAN KAP1247, SECTION 5, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, & SEC 32 TWP 29	**7.79**	**$1,218.51**
21704008004	4025 CASORSO, KELOWNA	LOT 1, PLAN EPP72879, SECTION 5, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**5.60**	**$875.95**
21704008005	4100 TODD, KELOWNA	LOT 2, PLAN EPP72879, SECTION 5, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21704014004	3896A CASORSO, KELOWNA	LOT A, PLAN KAP92331, SECTION 5, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**7.81**	**$1,221.64**
21704016000	3877 CASORSO, KELOWNA	LOT 4, PLAN KAP2243, SECTION 5, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.51**	**$236.19**
21704021000	3995 CASORSO, KELOWNA	LOT 8, PLAN KAP2243, SECTION 5, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.94**	**$772.71**
21704023001	1989 WARD, KELOWNA	LOT 1, PLAN EPP95434, SECTION 5, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**8.96**	**$1,401.52**
21704029000	4153 BEDFORD, KELOWNA	LOT 1, PLAN KAP15793, SECTION 5, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, (DD D29970) SEC 32 TWP 29	**5.77**	**$902.54**
21704031000	4122 BEDFORD, KELOWNA	LOT 4, PLAN KAP15793, SECTION 5, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.88**	**$294.07**
21704032158	3860 CASORSO, KELOWNA	LOT 2, PLAN KAP89549, SECTION 5, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21704084000	2090 WARD, KELOWNA	LOT B, PLAN KAP1780, SECTION 8, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**13.48**	**$2,108.54**
21704118205	1950 WARD, KELOWNA	LOT A, PLAN KAP48946, SECTION 8, TOWNSHIP 12, OSOYOOS DIV OF YALE LAND DISTRICT	**12.00**	**$1,877.04**
21704118206	1990 WARD, KELOWNA	LOT B, PLAN KAP48946, SECTION 8, TOWNSHIP 12, OSOYOOS DIV OF YALE LAND DISTRICT	**1.76**	**$275.30**
21704121000	3677 SPIERS, KELOWNA	LOT 1, BLOCK 2, PLAN KAP1072, SECTION 9, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B5219 14900	**7.25**	**$1,134.05**
21704127000	3663 SPIERS, KELOWNA	LOT 2, PLAN KAP1765, SECTION 9, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 19631 KAP45040 KAP70726	**7.25**	**$1,134.05**
21704151030	3769 SPIERS, KELOWNA	LOT 1, PLAN KAP23684, SECTION 9, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.66**	**$259.66**
21704151105	2190 GULLEY, KELOWNA	LOT A, PLAN KAP26008, SECTION 9, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**7.69**	**$1,202.87**
21704151150	3668 SPIERS, KELOWNA	LOT B, PLAN KAP28797, SECTION 9, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21704151155	3678 SPIERS, KELOWNA	LOT C, PLAN KAP28797, SECTION 9, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**6.48**	**$1,013.60**
21704151192	2777 K.L.O., KELOWNA	LOT A, PLAN KAP43297, SECTION 9&10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**9.55**	**$1,493.81**
21704151195	3740 HART, KELOWNA	LOT 6, PLAN KAP29282, SECTION 9, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**12.42**	**$1,942.74**

21704151200	2452 GULLEY, KELOWNA	LOT 7, PLAN KAP29282, SECTION 9, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**20.34**	**$3,181.58**
21704151210	2725 K.L.O., KELOWNA	LOT A, PLAN KAP45934, SECTION 9 & 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**19.61**	**$3,067.40**
21704151260	2295 K.L.O., KELOWNA	LOT 2, PLAN KAP33463, SECTION 9, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.16**	**$650.71**
21704151265	3551 SPIERS, KELOWNA	LOT 3, PLAN KAP33463, SECTION 9, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP44147	**2.86**	**$447.36**
21704151292	2202 GULLEY, KELOWNA	LOT A, PLAN KAP44147, SECTION 9, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.85**	**$602.22**
21704152000	3690 POOLEY, KELOWNA	SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, N 10 CHAINS OF E 1/2 OF NE 1/4	**16.99**	**$2,657.58**
21704156000	3455 ROSE, KELOWNA	LOT 4, PLAN KAP355, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**12.19**	**$1,906.76**
21704157051	3480 FITZGERALD, KELOWNA	LOT 5, PLAN KAP355, PART E1/2, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 30818	**10.07**	**$1,575.15**
21704159000	3030 MCCULLOCH, KELOWNA	LOT 4, PLAN KAP790, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 11840	**3.81**	**$595.96**
21704160001	3090 MCCULLOCH, KELOWNA	LOT 5, PLAN KAP790, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 18708 33271	**5.64**	**$882.21**
21704161000	3641 HART, KELOWNA	LOT 7, PLAN KAP790, PART N1/2, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.11**	**$486.47**
21704167000	3286 MCCULLOCH, KELOWNA	LOT 3, PLAN KAP978, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**6.46**	**$1,010.47**
21704173000	3020 MCCULLOCH, KELOWNA	LOT 3, PLAN KAP1517, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B1212 B5633	**1.47**	**$229.94**
21704174002	3099 MCCULLOCH, KELOWNA	LOT B, PLAN KAP71621, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.91**	**$455.18**
21704176000	3591 HART, KELOWNA	LOT 3, PLAN KAP1589, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.33**	**$520.88**
21704179000	3635 REEKIE, KELOWNA	LOT A, PLAN KAP2038, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**11.36**	**$1,776.93**
21704180000	3695 FITZGERALD, KELOWNA	LOT B, PLAN KAP2038, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**24.89**	**$3,893.29**
21704181000	3520 REEKIE, KELOWNA	LOT 1, PLAN KAP2398, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# 73821	**3.95**	**$617.86**
21704183000	3680 REEKIE, KELOWNA	LOT 2, PLAN KAP2398, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**6.11**	**$955.73**
21704184000	3096 MCCULLOCH, KELOWNA	LOT 1, PLAN KAP2957, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 10713 & KAP46590	**1.00**	**$156.42**
21704194000	3275 MCCULLOCH, KELOWNA	LOT 1, PLAN KAP6530, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**12.18**	**$1,905.20**
21704198000	3524 ROSE, KELOWNA	LOT A, PLAN KAP11840, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# 078725	**4.77**	**$746.12**
21704199100	3564 ROSE, KELOWNA	LOT A, PLAN KAP18708, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**11.96**	**$1,870.78**
21704199156	3269 MCCULLOCH, KELOWNA	LOT 2, PLAN KAP90496, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.06**	**$322.23**
21704199180	3301 MCCULLOCH, KELOWNA	LOT 2, PLAN KAP28811, SECTION 3, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, & SEC 10	**14.83**	**$2,319.71**
21704199252	3630 FITZGERALD, KELOWNA	LOT B, PLAN KAP30817, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EX MH OCCUPIER (SEE 217-04199-253)	**10.10**	**$1,579.84**
21704199256	3661 HART, KELOWNA	LOT A, PLAN KAP31613, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21704199278	3565 ROSE, KELOWNA	LOT A, PLAN KAP38325, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**7.87**	**$1,231.03**

21704199308	3665 HART, KELOWNA	LOT 1, PLAN EPP74364, SECTION 10, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.40**	**$688.25**
21704209000	2502 BELGO, KELOWNA	LOT 6, BLOCK 16, PLAN KAP1380, SECTION 11, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B1528 H17537, MANUFACTURED HOME REG.# 46438	**6.51**	**$1,018.29**
21704214000	2605 BELGO, KELOWNA	LOT 3, BLOCK 17, PLAN KAP1380, SECTION 11, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN H17537, EXC R/S 7534 .153 AC	**8.54**	**$1,335.83**
21704215000	2505 BELGO, KELOWNA	LOT 4, BLOCK 17, PLAN KAP1380, SECTION 11, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN H17537 KAP68946 KAP76995	**6.51**	**$1,018.29**
21704220000	3950 BORLAND, KELOWNA	PLAN KAP1862B, SECTION 11, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP70445	**2.92**	**$456.75**
21704222000	3527 BEMROSE, KELOWNA	LOT 2, PLAN KAP2005, SECTION 11, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# 70201	**3.60**	**$563.11**
21704223000	3835 BORLAND, KELOWNA	LOT A, PLAN KAP2645, SECTION 11, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.08**	**$638.19**
21704228000	3625 BEMROSE, KELOWNA	LOT A, PLAN KAP4553, SECTION 11, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP59561	**7.45**	**$1,165.33**
21704232000	3647 BEMROSE, KELOWNA	LOT 1, PLAN KAP5787, SECTION 11, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# 72602	**2.94**	**$459.87**
21704235000	3975 SENGER, KELOWNA	LOT A, PLAN KAP6633, SECTION 11, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.62**	**$409.82**
21704237120	2149 BELGO, KELOWNA	LOT 1, BLOCK 17, PLAN KAP31521, SECTION 11&14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP69980 & KAP73861	**10.04**	**$1,570.46**
21704237130	2327 BELGO, KELOWNA	LOT 1, PLAN KAP33009, SECTION 11, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN H17537, EPP30052	**9.29**	**$1,453.14**
21704237137	3547 BEMROSE, KELOWNA	LOT 1, PLAN KAP71097, SECTION 26, TOWNSHIP 11, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21704237138	2547 BELGO, KELOWNA	LOT A, PLAN KAP76995, SECTION 11, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21704243000	2455 WALBURN, KELOWNA	LOT B, PLAN KAP3238B, SECTION 12, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP68575, PT L B OF PL 1639 S/O ON PL B3238	**6.94**	**$1,085.55**
21704245051	2601 WALBURN, KELOWNA	LOT 2, PLAN KAP62978, SECTION 12, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.11**	**$330.05**
21704247000	1190 LEWIS, KELOWNA	LOT 9, BLOCK 9, PLAN KAP1380, SECTION 13, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 10873, MANUFACTURED HOME REG.# 70462	**5.69**	**$890.03**
21704248000	2290 GARNER, KELOWNA	LOT 2, BLOCK 18, PLAN KAP1380, SECTION 13, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**7.52**	**$1,176.28**
21704249000	2148 WALBURN, KELOWNA	LOT 4, BLOCK 18, PLAN KAP1380, SECTION 13, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**10.44**	**$1,633.02**
21704254000	1093 TEASDALE, KELOWNA	LOT 8, BLOCK 20, PLAN KAP1380, SECTION 13&14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**5.17**	**$808.69**
21704258000	1404 LEWIS, KELOWNA	LOT 2, PLAN KAP1926, SECTION 13, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN H16654, MANUFACTURED HOME REG.# 52828	**9.97**	**$1,559.51**
21704261000	1839 WALBURN, KELOWNA	LOT 7, PLAN KAP1926, DISTRICT LOT 508, SECTION 13, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**5.61**	**$877.52**
21704269002	2015 WALBURN, KELOWNA	LOT 2, PLAN KAP4119, SECTION 13, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 20534, 34516, MANUFACTURED HOME REG.# 76344	**1.00**	**$156.42**
21704270003	1959 WALBURN, KELOWNA	LOT B, PLAN KAP91170, SECTION 13, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21704310500	2021 WALBURN, KELOWNA	LOT A, PLAN KAP34516, SECTION 13, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**

21704315000	3855 EAST KELOWNA, KELOWNA	LOT 13, PLAN KAP665, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 20082 & KAP44096	**4.96**	**$775.84**
21704317000	2075 BELGO, KELOWNA	LOT 9, BLOCK 17, PLAN KAP1380, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 19507 & KAP69980	**3.07**	**$480.21**
21704318001	1865 BELGO, KELOWNA	LOT 11, BLOCK 17, PLAN KAP1380, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 32086	**8.04**	**$1,257.62**
21704319000	2280 HOLLYWOOD, KELOWNA	LOT 12, BLOCK 17, PLAN KAP1380, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN H13888 KAP52999	**1.67**	**$261.22**
21704324000	1650 GEEN, KELOWNA	LOT 3, BLOCK 19, PLAN KAP1380, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.64**	**$256.53**
21704325001	1390 GEEN, KELOWNA	LOT A, PLAN KAP90868, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**5.27**	**$824.33**
21704327004	1595 TEASDALE, KELOWNA	LOT B, PLAN EPP32484, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.87**	**$448.93**
21704329000	1409 TEASDALE, KELOWNA	LOT 8, BLOCK 19, PLAN KAP1380, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 18554	**1.00**	**$156.42**
21704330000	1555 TEASDALE, KELOWNA	LOT 10, BLOCK 19, PLAN KAP1380, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EX PT INCL IN PL ATTACHED TO DD188738F	**1.04**	**$162.68**
21704334001	1225 TEASDALE, KELOWNA	LOT 6, BLOCK 20, PLAN KAP1380, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 23119	**3.66**	**$572.50**
21704335000	1103 TEASDALE, KELOWNA	LOT 7, BLOCK 20, PLAN KAP1380, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.17**	**$339.43**
21704343000	2270 HOLLYWOOD, KELOWNA	LOT A, PLAN KAP1845, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21704344000	2015 BELGO, KELOWNA	LOT B, PLAN KAP1845, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN EPP76229	**8.87**	**$1,387.45**
21704345000	1525 GEEN, KELOWNA	LOT A, PLAN KAP1846, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.45**	**$226.81**
21704350000	1469 TEASDALE, KELOWNA	LOT 1, PLAN KAP4384, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**7.19**	**$1,124.66**
21704351000	1429 TEASDALE, KELOWNA	LOT 2, PLAN KAP4384, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21704360093	3754 EAST KELOWNA, KELOWNA	LOT B, PLAN KAP84170, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# 14820	**6.87**	**$1,074.61**
21704360267	1708 GEEN, KELOWNA	LOT 1, PLAN KAP82075, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# 103088	**2.05**	**$320.66**
21704360268	1605 GEEN, KELOWNA	LOT 2, PLAN KAP82075, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**6.99**	**$1,093.38**
21704360354	1950 BELGO, KELOWNA	LOT 2, PLAN KAP25528, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**14.26**	**$2,230.55**
21704360527	3795 EAST KELOWNA, KELOWNA	LOT A, PLAN KAP58793, SECTION 14, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# 64814	**1.72**	**$269.04**
21704364000	2995 DUNSTER, KELOWNA	LOT 6, PLAN KAP187, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, N 378 FT L 6	**1.00**	**$156.42**
21704365000	3098 EAST KELOWNA, KELOWNA	LOT 6, PLAN KAP187, PART N1/2, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, PORTION EXC NLY 378 FT	**1.08**	**$168.93**
21704366000	3002 EAST KELOWNA, KELOWNA	LOT 6, PLAN KAP187, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, W 1/2 OF THE S 1/2 OF L 6	**2.39**	**$373.84**

21704367000	2855 DUNSTER, KELOWNA	LOT 7, PLAN KAP187, PART N1/2, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP77776	**15.87**	**$2,482.39**
21704368000	3152 EAST KELOWNA, KELOWNA	LOT 7, PLAN KAP187, PART S1/2, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# 11658	**13.29**	**$2,078.82**
21704369000	2795 DUNSTER, KELOWNA	LOT 8, PLAN KAP187, PART N1/2, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**17.25**	**$2,698.25**
21704370002	3250 EAST KELOWNA, KELOWNA	LOT B, PLAN EPP54381, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**13.16**	**$2,058.49**
21704372000	3208 REID, KELOWNA	LOT 18, PLAN KAP187, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, N 740.8 FT L 18	**6.07**	**$949.47**
21704375000	3350 POOLEY, KELOWNA	LOT 20, PLAN KAP187, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B1536 B1720 5512	**3.62**	**$566.24**
21704379000	3073 DUNSTER, KELOWNA	LOT 12, PLAN KAP665, SECTION 16, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.89**	**$608.47**
21704380000	3502 EAST KELOWNA, KELOWNA	LOT 11, PLAN KAP187, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, PORTION SHOWN ON PL B716	**8.21**	**$1,284.21**
21704381000	2947 EAST KELOWNA, KELOWNA	LOT 1, PLAN KAP736, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**7.42**	**$1,160.64**
21704382000	2981 EAST KELOWNA, KELOWNA	LOT 2, PLAN KAP736, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**5.78**	**$904.11**
21704385000	3072 EAST KELOWNA, KELOWNA	LOT 6, PLAN KAP821B, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, E 1/2 OF S 1/2 OF L 6 PL 187 S/O PL B821	**1.33**	**$208.04**
21704386002	3652 EAST KELOWNA, KELOWNA	LOT 12, PLAN KAP187, PART E1/2, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, PORTION (PL B900)	**1.07**	**$167.37**
21704387000	3183 DUNSTER, KELOWNA	PLAN KAP187, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, N 1/2 OF S 1/2 OF LOT 5 SHOWN ON PL B1156, MANUFACTURED HOME REG.# 15739	**2.29**	**$358.20**
21704394000	3582 EAST KELOWNA, KELOWNA	LOT B, PLAN KAP1670, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.19**	**$342.56**
21704396000	2960 MCCULLOCH, KELOWNA	LOT B, PLAN KAP1703, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B4658	**4.42**	**$691.38**
21704400000	3430 POOLEY, KELOWNA	LOT B, PLAN KAP1725, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP53451	**10.32**	**$1,614.25**
21704402000	3251 EAST KELOWNA, KELOWNA	LOT 1, PLAN KAP3379, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.89**	**$608.47**
21704404000	3260 POOLEY, KELOWNA	LOT 3, PLAN KAP3379, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**9.13**	**$1,428.11**
21704412000	3288 REID, KELOWNA	LOT A, PLAN KAP4618, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B7432	**11.02**	**$1,723.75**
21704416000	3329 EAST KELOWNA, KELOWNA	LOT 1, PLAN KAP5512, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.47**	**$386.36**
21704418000	3375 DALL, KELOWNA	LOT 1, PLAN KAP6585, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.44**	**$538.08**
21704420000	3060 POOLEY, KELOWNA	Lot 2, Plan KAP6585, Section 15, Township 26, Osoyoos Div of Yale Land District, Except Plan EPP90643	**2.15**	**$336.30**
21704423190	3350 EAST KELOWNA, KELOWNA	LOT 1, PLAN KAP30593, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21704423192	3310 EAST KELOWNA, KELOWNA	LOT 2, PLAN KAP30593, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**11.89**	**$1,859.83**
21704423198	3120 POOLEY, KELOWNA	LOT B, PLAN KAP34888, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**9.08**	**$1,420.29**
21704423205	3480 POOLEY, KELOWNA	LOT A, PLAN KAP53451, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21704423207	3367 REID, KELOWNA	LOT B, PLAN KAP55650, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.86**	**$290.94**

21704423209	3360 REID, KELOWNA	LOT 2, PLAN KAP56635, SECTION 15, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.48**	**$700.76**
21704428000	3395 NEID, KELOWNA	LOT 26, PLAN KAP187, SECTION 16, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B129, S 1/2 OF LOT, MANUFACTURED HOME REG.# B02269	**1.00**	**$156.42**
21704432000	3194 DUNSTER, KELOWNA	LOT 5, PLAN KAP665, SECTION 16, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.94**	**$303.45**
21704433000	3172 DUNSTER, KELOWNA	LOT 6, PLAN KAP665, SECTION 16, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.17**	**$183.01**
21704436000	1 - 3042 DUNSTER, KELOWNA	LOT 9, PLAN KAP665, SECTION 16, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.67**	**$261.22**
21704525228	2877 EAST KELOWNA, KELOWNA	LOT B, PLAN KAP33697, SECTION 16, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.26**	**$197.09**
21704525503	2690 BEWLAY, KELOWNA	LOT 1, PLAN KAP56199, SECTION 16, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.20**	**$500.54**
21704574000	2990 DUNSTER, KELOWNA	PLAN KAP1353B, PART SE1/4, SECTION 21, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, THAT PART OF THE FRACTIONAL	**9.71**	**$1,518.84**
21704591000	2934 DUNSTER, KELOWNA	LOT C, PLAN KAP1700, SECTION 22, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**7.88**	**$1,232.59**
21704805214	2960 DUNSTER, KELOWNA	LOT 1, PLAN KAP73437, SECTION 22, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**11.13**	**$1,740.95**
21704825001	1 - 1368 TEASDALE, KELOWNA	LOT 3, PLAN KAP2329, SECTION 23, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 4697, 34964, H12752	**21.79**	**$3,408.39**
21704898001	879 HIGHWAY 33, KELOWNA	LOT 1, PLAN EPP32580, SECTION 23&24, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**5.75**	**$899.42**
21705479000	3363 SPRINGFIELD, KELOWNA	LOT 5, PLAN KAP1802, SECTION 24, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN H8383, H12752, KAP88622	**1.00**	**$156.42**
21705502130	811 HIGHWAY 33, KELOWNA	LOT A, PLAN KAP23321, SECTION 24, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP88565	**1.21**	**$189.27**
21705502305	1151 LEWIS, KELOWNA	LOT A, PLAN KAP33567, SECTION 24, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.57**	**$245.58**
21705502310	881 HIGHWAY 33, KELOWNA	LOT B, PLAN KAP33567, SECTION 24, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP89364, EPP7143	**8.43**	**$1,318.62**
21705503005	688 WEBSTER, KELOWNA	LOT 1, PLAN KAP92447, SECTION 25, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21705510000	920 HARTMAN, KELOWNA	LOT 3, PLAN KAP731, SECTION 25, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, C OF T 143842F	**5.77**	**$902.54**
21705511000	1130 HARTMAN, KELOWNA	LOT 4, PLAN KAP731, SECTION 25, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP78162	**1.09**	**$170.50**
21705512000	690 MUGFORD, KELOWNA	LOT 3, PLAN KAP603, SECTION 25, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, PORTION SHOWN ON PL B797	**4.32**	**$675.73**
21705513004	1120 GIBSON, KELOWNA	LOT B, PLAN EPP11757, SECTION 25, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.28**	**$669.48**
21705514000	1145 MORRISON, KELOWNA	LOT 2, PLAN KAP1515, SECTION 25, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.63**	**$254.96**
21705519002	1610 SWAINSON, KELOWNA	LOT 1, PLAN KAP77945, SECTION 25 & 30, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, & SEC 27	**10.30**	**$1,611.13**
21705524000	1308 MCKENZIE, KELOWNA	LOT 12, PLAN KAP1760, SECTION 25, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B4687 & KAP77650	**4.42**	**$691.38**
21705530000	1550 SWAINSON, KELOWNA	LOT 1, PLAN KAP77944, SECTION 25 & 30, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, & TWP 27	**13.42**	**$2,099.16**
21705548000	1090 MCKENZIE, KELOWNA	LOT 2, PLAN KAP4586, SECTION 25, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B7112 19263 20308	**18.71**	**$2,926.62**

21705561000	690 HARTMAN, KELOWNA	LOT A, PLAN KAP5499, SECTION 25, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP60758, KAP87365	**16.60**	**$2,596.57**
21705579469	1045 EL PASO, KELOWNA	LOT 22, PLAN KAP22986, SECTION 25, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**5.95**	**$930.70**
21705579575	839 HARTMAN, KELOWNA	LOT 2, PLAN KAP29183, SECTION 25, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP58413	**11.16**	**$1,745.65**
21705579684	837 HARTMAN, KELOWNA	LOT A, PLAN KAP35135, SECTION 25, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.66**	**$416.08**
21706374002	563 VALLEY, KELOWNA	LOT 1, PLAN EPP32871, SECTION 32, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, & SEC'S 28 & 33	**1.00**	**$156.42**
21706470000	483 VALLEY, KELOWNA	LOT 1, BLOCK 9, PLAN KAP896, SECTION 32, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**5.47**	**$855.62**
21706471000	463 VALLEY, KELOWNA	LOT 2, BLOCK 9, PLAN KAP896, SECTION 32&33, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.55**	**$242.45**
21706499001	445 VALLEY, KELOWNA	LOT 3, BLOCK 9, PLAN KAP896, SECTION 33, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 13784 23545	**3.75**	**$586.58**
21706501000	2224 ROJEM, KELOWNA	LOT 4, BLOCK 9, PLAN KAP896, SECTION 33, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.06**	**$322.23**
21706502000	389 VALLEY, KELOWNA	LOT 5, BLOCK 9, PLAN KAP896, SECTION 33, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.17**	**$652.27**
21706504000	355 VALLEY, KELOWNA	LOT 7, BLOCK 9, PLAN KAP896, SECTION 33, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B3900	**2.98**	**$466.13**
21706507000	2429 LONGHILL, KELOWNA	LOT 14, BLOCK 9, PLAN KAP1068, SECTION 33, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**7.01**	**$1,096.50**
21706508000	2449 LONGHILL, KELOWNA	LOT 15, BLOCK 9, PLAN KAP1068, SECTION 33, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B6691	**1.46**	**$228.37**
21706510000	120 MAIL, KELOWNA	LOT 15, BLOCK 17, PLAN KAP1068, SECTION 33&34, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**7.80**	**$1,220.08**
21706511000	102 MAIL, KELOWNA	LOT 16, BLOCK 17, PLAN KAP1068, SECTION 33&34, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 18945	**8.44**	**$1,320.18**
21706515000	545 RIFLE, KELOWNA	LOT 7, BLOCK 21, PLAN KAP1249, SECTION 33&34, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**6.11**	**$955.73**
21706524000	30 - 2300 SILVER, KELOWNA	LOT 8, BLOCK 22, PLAN KAP1249, SECTION 33, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.43**	**$536.52**
21706527000	2255 ROJEM, KELOWNA	LOT 11, BLOCK 22, PLAN KAP1249, SECTION 33, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.42**	**$691.38**
21706528000	2309 ROJEM, KELOWNA	LOT 12, BLOCK 22, PLAN KAP1249, SECTION 33, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.36**	**$681.99**
21706529000	2323 ROJEM, KELOWNA	LOT 13, BLOCK 22, PLAN KAP1249, SECTION 33, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.04**	**$162.68**
21706533000	2379 ROJEM, KELOWNA	LOT 17, BLOCK 22, PLAN KAP1249, SECTION 33, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B6651	**1.97**	**$308.15**
21706554140	2400 LONGHILL, KELOWNA	LOT A, PLAN KAP26592, SECTION 4&33, TOWNSHIP 23, OSOYOOS DIV OF YALE LAND DISTRICT, & TWP 26	**2.41**	**$376.97**
21706557002	2710 LONGHILL, KELOWNA	LOT B, PLAN KAP88097, SECTION 34, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21706612470	2512 LONGHILL, KELOWNA	LOT A, PLAN KAP26258, SECTION 33&34, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 40166, MANUFACTURED HOME REG.# 85193	**13.49**	**$2,110.11**
21706612672	2614 LONGHILL, KELOWNA	LOT 1, PLAN KAP40166, SECTION 34, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.17**	**$339.43**
21706645000	610 MOYER, KELOWNA	LOT 26, PLAN KAP425, SECTION 35&36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.61**	**$564.68**
21706647000	610 CORNISH, KELOWNA	LOT 28, PLAN KAP425, SECTION 35, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, & SEC 36	**7.94**	**$1,241.97**
21706658000	355 CORNISH, KELOWNA	LOT 41, PLAN KAP425, SECTION 35, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.64**	**$569.37**
21706661000	298 CORNISH, KELOWNA	LOT 45, PLAN KAP425, SECTION 35, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.31**	**$674.17**

21706723000	310 FITZPATRICK, KELOWNA	LOT 2, PLAN KAP9092, SECTION 35, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21706773003	1685 RUTLAND, KELOWNA	LOT 3, PLAN KAP18313, SECTION 35, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.05**	**$320.66**
21706773440	585 CORNISH, KELOWNA	LOT 1, PLAN KAP19142, SECTION 35, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.86**	**$603.78**
21706774244	245 CORNISH, KELOWNA	LOT B, PLAN KAP43294, SECTION 35, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.16**	**$337.87**
21706776850	2105 MORRISON, KELOWNA	LOT 1, PLAN KAP425, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP77337	**7.05**	**$1,102.76**
21706776900	1990 MCKENZIE, KELOWNA	LOT 2, PLAN KAP425, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP78155, KAP92012	**10.58**	**$1,654.92**
21706777000	1900 MCKENZIE, KELOWNA	LOT 3, PLAN KAP425, PART N1/2, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**5.20**	**$813.38**
21706778000	1893 MORRISON, KELOWNA	LOT 3, PLAN KAP425, PART S1/2, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**2.63**	**$411.38**
21706788000	1304 MORRISON, KELOWNA	LOT 10, PLAN KAP425, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**7.59**	**$1,187.23**
21706789000	819 MOYER, KELOWNA	LOT 11, PLAN KAP425, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# 82699	**3.98**	**$622.55**
21706792000	2062 MORRISON, KELOWNA	LOT 14, PLAN KAP425, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**4.79**	**$749.25**
21706794000	2 - 685 OLD VERNON, KELOWNA	LOT 16, PLAN KAP425, SECTION 35 & 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**3.84**	**$600.65**
21706796000	745 CORNISH, KELOWNA	LOT 18, PLAN KAP425, SECTION 35 & 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**6.35**	**$993.27**
21706799510	1425 MORRISON, KELOWNA	LOT B, PLAN EPP15301, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**7.41**	**$1,159.07**
21706803000	1350 HORNING, KELOWNA	LOT 20, PLAN KAP1760, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP53546	**14.63**	**$2,288.42**
21706805005	1920 MCCURDY, KELOWNA	LOT 3, PLAN KAP91486, SECTION 31, TOWNSHIP 27, OSOYOOS DIV OF YALE LAND DISTRICT	**8.19**	**$1,281.08**
21706806000	1431 LATTA, KELOWNA	LOT 24, PLAN KAP1760, SECTION 36&31, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, & TWP 27	**1.00**	**$156.42**
21706807001	1305 LATTA, KELOWNA	LOT 25, PLAN KAP1760, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B4218 & 33998	**7.55**	**$1,180.97**
21706810002	1341 LATTA, KELOWNA	LOT 28, PLAN KAP1760, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 31944	**9.96**	**$1,557.94**
21706817001	1331 MCCURDY, KELOWNA	LOT 1, PLAN KAP4060, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 30660 KAP67186	**19.59**	**$3,064.27**
21706819000	1545 MCCURDY, KELOWNA	LOT 3, PLAN KAP4060, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP56029 & KAP63091	**15.92**	**$2,490.21**
21706820000	1445 LATTA, KELOWNA	LOT 25, PLAN KAP4218B, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**5.22**	**$816.51**
21706828500	1750 MCKENZIE, KELOWNA	LOT B, PLAN KAP25654, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP90335	**10.24**	**$1,601.74**
21706828524	1700 MCKENZIE, KELOWNA	LOT D, PLAN KAP25654, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**7.36**	**$1,151.25**
21706828618	1301 LATTA, KELOWNA	LOT 1, PLAN KAP33998, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, HERETO IS ANNEXED EASEMENT CA3247673 OVER LOT 25 PL 1760 EXC PLANS B4218 & 33998 THIS CERTIFICATE OF TITLE MAY BE AFFECTED BY THE AGRICULTURAL LAND COMMISSION ACT; SEE PL M11328	**1.00**	**$156.42**
21706828642	837 MCCURDY, KELOWNA	LOT 2, PLAN EPP14181, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**

21706828644	833 MCCURDY, KELOWNA	LOT 3, PLAN EPP14181, SECTION 36, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21706886003	1 - 2025 TREETOP, KELOWNA	LOT 1, PLAN KAP1760, SECTION 19, TOWNSHIP 27, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 26646, & SEC 30 & EXC PL 30907, MANUFACTURED HOME REG.# 13479	**9.58**	**$1,498.50**
21706960185	5681 LAKESHORE, KELOWNA	LOT 1, PLAN EPP37698, SECTION 16, TOWNSHIP 28, SIMILKAMEEN DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21707143000	559 BARNABY, KELOWNA	LOT 3, PLAN KAP1743, SECTION 25, TOWNSHIP 28, SIMILKAMEEN DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21707161000	4860 LAKESHORE, KELOWNA	PARCEL A, PLAN KAP1722, SECTION 25, TOWNSHIP 29, SIMILKAMEEN DIV OF YALE LAND DISTRICT, SHOWN ON PL B5804 OF LOT 3	**3.21**	**$502.11**
21707264002	1456 DEHART, KELOWNA	LOT 1, PLAN KAP1837, SECTION 31&32, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 21254 28408	**11.58**	**$1,811.34**
21707269000	999 CRAWFORD, KELOWNA	LOT 1, PLAN KAP13170, SECTION 31, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 20569	**11.85**	**$1,853.58**
21707270072	1265 CRAWFORD, KELOWNA	LOT 2, PLAN KAP21104, SECTION 31, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21707270074	1285 CRAWFORD, KELOWNA	LOT 3, PLAN KAP21104, SECTION 31&32, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21707278000	4551 STEWART, KELOWNA	LOT 220, PLAN KAP1247, SECTION 32, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT	**2.89**	**$452.05**
21707287000	4335 STEWART, KELOWNA	LOT 229, PLAN KAP1247, SECTION 32, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN EPP89865	**3.02**	**$472.39**
21707290000	4285 STEWART, KELOWNA	LOT 232, PLAN KAP1247, SECTION 32, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN EPP89865	**6.85**	**$1,071.48**
21707291000	4202 BEDFORD, KELOWNA	LOT 233, PLAN KAP1247, SECTION 32, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN H9875	**9.74**	**$1,523.53**
21707293000	4250 STEWART, KELOWNA	LOT 238, PLAN KAP1247, SECTION 32, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT	**1.63**	**$254.96**
21707296000	1475 DEHART, KELOWNA	LOT 246, PLAN KAP1247, SECTION 32, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 6779	**1.00**	**$156.42**
21707304000	4132 BEDFORD, KELOWNA	LOT 3, PLAN KAP15793, SECTION 32, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT	**6.38**	**$997.96**
21707304010	1485 DEHART, KELOWNA	LOT 1, PLAN KAP20969, SECTION 32, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT	**1.21**	**$189.27**
21707351000	4305 JAUD, KELOWNA	LOT 5, PLAN KAP6171, SECTION 34, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN EPP120634	**11.06**	**$1,730.01**
21707362338	2950 BALLDOCK, KELOWNA	LOT 10, PLAN KAP74510, SECTION 34, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21709533000	2517 GALE, KELOWNA	LOT 2, PLAN KAP10810, DISTRICT LOT 32A, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 19044, H15414	**6.08**	**$951.03**
21709533052	2499 GALE, KELOWNA	LOT C, PLAN KAP19044, DISTRICT LOT 32A, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21709533053	2475 GALE, KELOWNA	LOT D, PLAN KAP19044, DISTRICT LOT 32A, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21709533054	2449 GALE, KELOWNA	LOT E, PLAN KAP19044, DISTRICT LOT 32A, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21709533055	2427 GALE, KELOWNA	LOT F, PLAN KAP19044, DISTRICT LOT 32A, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21709533057	2555 GALE, KELOWNA	LOT A, PLAN EPP65442, DISTRICT LOT 32A, OSOYOOS DIV OF YALE LAND DISTRICT	**1.39**	**$217.42**
21710392000	2240 MAYER, KELOWNA	LOT 1, PLAN KAP2332, DISTRICT LOT 128, OSOYOOS DIV OF YALE LAND DISTRICT	**20.16**	**$3,153.43**

21710393000	2050 BYRNS, KELOWNA	LOT 1, PLAN KAP2830, DISTRICT LOT 128, SECTION 17, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# B00730	**19.86**	**$3,106.50**
21710410000	1756 BYRNS, KELOWNA	LOT 23, PLAN KAP415, DISTRICT LOT 129, OSOYOOS DIV OF YALE LAND DISTRICT, EX E 4.14 CHNS, MANUFACTURED HOME REG.# 49222	**11.34**	**$1,773.80**
21710411000	1890 BYRNS, KELOWNA	LOT 23, PLAN KAP415, DISTRICT LOT 129, SECTION 19, TOWNSHIP 26, OSOYOOS DIV OF YALE LAND DISTRICT, E 4.14 CHNS L 23, MANUFACTURED HOME REG.# 105820	**4.35**	**$680.43**
21710414000	1756 BYRNS, KELOWNA	LOT 26, PLAN KAP415, DISTRICT LOT 129, OSOYOOS DIV OF YALE LAND DISTRICT, EX E 4.14 CHNS	**10.62**	**$1,661.18**
21710518000	1650 BYRNS, KELOWNA	LOT 2, PLAN KAP78759, DISTRICT LOT 129, OSOYOOS DIV OF YALE LAND DISTRICT	**3.61**	**$564.68**
21710519852	2225 SPALL, KELOWNA	LOT B, PLAN KAP40808, DISTRICT LOT 129, OSOYOOS DIV OF YALE LAND DISTRICT	**13.03**	**$2,038.15**
21710519854	1980 BYRNS, KELOWNA	LOT C, PLAN KAP40808, DISTRICT LOT 129, OSOYOOS DIV OF YALE LAND DISTRICT, MANUFACTURED HOME REG.# 20597	**10.95**	**$1,712.80**
21710519856	1990 BYRNS, KELOWNA	LOT D, PLAN KAP40808, DISTRICT LOT 129, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21710531000	1909 BYRNS, KELOWNA	LOT 15, PLAN KAP415, DISTRICT LOT 130, OSOYOOS DIV OF YALE LAND DISTRICT, E 10 ACRES OF L 15	**6.34**	**$991.70**
21710543001	2589 BENVOULIN, KELOWNA	LOT 1, PLAN KAP3357, DISTRICT LOT 130, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 15515 20646 23696	**5.66**	**$885.34**
21710549000	2029 BYRNS, KELOWNA	LOT 2, PLAN KAP8615, DISTRICT LOT 130, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN 16912	**7.94**	**$1,241.97**
21710589113	1909 BYRNS, KELOWNA	LOT B, PLAN KAP67173, DISTRICT LOT 130, OSOYOOS DIV OF YALE LAND DISTRICT	**23.50**	**$3,675.87**
21711501711	4345 HOBSON, KELOWNA	LOT 25, PLAN KAP27559, DISTRICT LOT 167, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN KAP64149 KAP68293 KAP73487 EPP16570 EPP46682	**1.00**	**$156.42**
21711502309	4340 HOBSON, KELOWNA	LOT A, PLAN KAP69885, DISTRICT LOT 167, OSOYOOS DIV OF YALE LAND DISTRICT	**1.00**	**$156.42**
21712185885	4485 SALLOWS, KELOWNA	LOT 184, PLAN KAP1247, DISTRICT LOT 359, SECTION 33, TOWNSHIP 29, OSOYOOS DIV OF YALE LAND DISTRICT	**2.04**	**$319.10**
21712199082	4380 WALLACE HILL, KELOWNA	LOT 2, PLAN KAP39632, DISTRICT LOT 360, OSOYOOS DIV OF YALE LAND DISTRICT	**4.70**	**$735.17**
21712199103	2740 HARVARD, KELOWNA	LOT 14, PLAN KAP62784, DISTRICT LOT 360, OSOYOOS DIV OF YALE LAND DISTRICT	**3.11**	**$486.47**
305			**1,757.88**	**$274,967.60**

Report to Council

Date:	April 24, 2023
To:	Council
From:	City Manager
Subject:	Rail Trail Access Permit with OKIB
Department:	Infrastructure

Recommendation:

THAT Council receives for information the report from the Infrastructure General Manager dated April 24, 2023, regarding the Rail Trail Access Permit between Kelowna and the Okanagan Indian Band;

AND THAT the Mayor and City Clerk be authorized to execute the Rail Trail Access Permit on behalf of the City of Kelowna.

Purpose:

To execute an agreement where Kelowna constructs, operates, and maintains the Okanagan Rail Trail on a Permit Area authorized by the Okanagan Indian Band on Indian Reserve No. 7.

Background:

In 2020, City of Kelowna staff entered negotiations with the District of Lake Country (DLC) and Okanagan Indian Band (OKIB) staff to craft agreements on mutually shared services and projects that would benefit each community. This work culminated in the Memorandum of Understanding (MOU) between the parties which was signed in February 2022.

Over the past year, the negotiation of several legal agreements has been conducted between the three partners and the Government of Canada. The parties are actively finalizing six separate legal agreements for the following subjects

MOU Ref #	Agreement Description	Status
1	Water supply agreement between Kelowna and Lake Country	Complete
2&3	Water and Wastewater Service Agreement between Kelowna and OKIB IR7	Subject of separate concurrent report
4a	Sewer permit agreement between Kelowna, OKIB and Canada	Complete
4b	***Rail Trail Access Permit between Kelowna and OKIB***	***Subject of this report***
4c	Commonwealth Road permit between Kelowna, OKIB and Canada	Under development
5	Sewer Agreement between Kelowna and Lake Country	Complete

Discussion:

The Rail Trail Access Permit (MOU Reference #4b) between Kelowna and OKIB is ready for execution and attached to this report.

Service Area: The Okanagan Rail Trail is a recreational multi-use pathway extending from Okanagan Lake in Kelowna to the District of Coldstream. Within IndianReserve#7, the Rail Trail will be approximately 4.0 metres wide and run 2,300 metres in length, constructed as a continuous, compacted aggregate or asphalt paved trail for the use of pedestrians, bicycles, e-bikes, wheelchairs and other non-motorized modes of transportation, as well as motorized scooters or similar mobility assistance devices used exclusively by persons with disabilities.

The "Permit Area" is part of 7.0125 hectares of land awaiting transfer to OKIB by the Government of Canada. This permit will allow construction to proceed upon the land transfer to OKIB.

Under this permit, OKIB authorizes the non-exclusive use of the Permit Area:

1. For the pass along and over and upon the Works Area for public recreation purposes: by foot, bike, e-bike, wheelchair, or other non-motorized modes of transportation as well as motorized scooters or similar mobility assistance devices used exclusively by persons with disabilities.
2. For Kelowna, its employees, contractors, subcontractors, agents, and invitees (including all members of the public), to construct, operate and maintain the Rail Trail.
3. Where Kelowna will comply with all applicable Laws.

Term: 5 years.

Costs: Kelowna pays $10.00 to OKIB on the Commencement Date, the receipt and sufficiency of which are hereby acknowledged by the parties. All construction costs are the responsibility of the City of Kelowna and its partners.

Conclusion:

The Rail Trail Access Permit is one of a suite of agreements envisioned in the 2022 MOU between Kelowna, DLC and OKIB. The commitments, both financial and technical, are consistent with the broader goals of resolving the many issues being addressed by the MOU. The Rail Trail Permit clarifies key terms

and allows the City to commit to providing the construction, maintenance, and limitations to OKIB as envisioned in the MOU.

Internal Circulation:
Financial Planning
Communications

Considerations applicable to this report:

Communications Comments:
A formal signing ceremony will be held to jointly complete several OKIB, DLC and Kelowna agreements.

Considerations not applicable to this report:
Legal/Statutory Authority:
Legal/Statutory Procedural Requirements:
Existing Policy:
Financial/Budgetary Considerations:
External Agency/Public Comments:

Submitted by: M. Logan, Infrastructure General Manager

Approved for inclusion: D. Gilchrist, City Manager

Attachment 1 – Rail Trail Permit Agreement 4b
Attachment 2 – Rail Trail Access Permit

cc: Divisional Director, Corporate Strategic Services
Acting Division Director, Financial Services

RAIL TRAIL PERMIT

BETWEEN:

OKANAGAN INDIAN BAND

AND:

CITY OF KELOWNA

Duck Lake Indian Reserve No. 7

Dated for Reference: April 24, 2023

Copy _____ of _____

RAIL TRAIL PERMIT

This permit, dated for reference April 24th 2023, is made between:

OKANAGAN INDIAN BAND, a "band" within the meaning of the *Indian Act* having an office at 12420 Westside Road, Vernon, BC, V1H 2A4

("OKIB")

and:

CITY OF KELOWNA, a municipality under the laws of British Columbia having an office at 1435 Water Street, Kelowna, BC V1Y 1J4

("Kelowna")

BACKGROUND:

A. The Reserve has been set apart for the use and benefit of OKIB;

B. Kelowna has requested to use the Permit Area as part of the Okanagan Rail Trail;

C. OKIB has agreed to authorize Kelowna to construct, operate and maintain a trail on the Permit Area on the terms and conditions set out in this Permit; and

D. The Council consented to the issuance of this Permit, and authorized its signatories to execute this Permit on behalf of OKIB, by way of resolution attached as Schedule A.

NOW THEREFORE, for mutual consideration, the Parties agree as follows:

1. **DEFINITIONS**

1.1 In this Permit, including the recitals, the following terms have the meanings ascribed to them in this section:

"**Adjacent Area**" means the approximately 1.5 metre area on either side of the Works Area.

"**Authority**" means any federal, provincial, municipal, OKIB or other governmental authority having jurisdiction in respect of the Permit Area, or the use of the Permit Area, including any utility company lawfully acting under its statutory power.

"**Authorized Uses**" means the uses referred to in subsection 3.1.1.

"**Commencement Date**" means the date that the Permit Area is set apart as a reserve under section 4 of the *Addition of Lands to Reserves and Reserve Creation Act*, S.C. 2018, c. 27, s. 675.

"**Construct**" includes to lay down, construct, install, erect, effect major repairs or replacement, alter, upgrade and reconstruct, but does not include regular ongoing maintenance required under section 3.8, and "**Construction**" has a similar meaning when the context requires.

"**Construction and Environmental Management Plan**" means:

(a) plans, design briefs and construction specifications and standards that are consistent with those used for other portions of the Okanagan Rail Trail off of Reserve, prepared and certified by an Engineer, on the basis that they may be relied upon by the Parties; and

(b) any other documents about the Works reasonably required by OKIB which comply with or are consistent with applicable Laws and includes plans and any mitigations measures required to address how any impacts on the Environment during construction or removal of the Works will be managed.

"**Contaminant**" includes any toxic substance, deleterious substance, hazardous substance, hazardous waste, hazardous recyclable, ozone-depleting substance, halocarbon, pesticide, waste, designated material or substance as defined in or pursuant to any applicable Environmental Laws.

"**Council**" means OKIB's "council of the band" within the meaning of the *Indian Act*.

"Engineer" means a person who is licensed to practice as an engineer in the province of British Columbia.

"**Environment**" has the meaning given it in the *Canadian Environmental Protection Act, 1999*, S.C. 1999, c. 33.

"**Environmental Laws**" means:

(a) any Laws relating, in whole or in part, to the assessment and protection of the Environment; and

(b) any decisions, determinations, mitigation measures, standards, codes, guidelines or environmental protection measures made pursuant to those Laws.

"**Indian Act**" means the *Indian Act*, R.S.C. 1985, c. I-5.

"**Laws**" means all laws, statutes, regulations, codes and by-laws, as amended or replaced from time to time.

"**Okanagan Rail Trail**" means the recreational multi-use pathway travelling from Kelowna to the District of Coldstream, which is approximately four (4.0) metres wide and spans 2,300 metres within the Reserve, constructed as a continuous, compacted aggregate or asphalt paved trail, for the use of pedestrians, bicycles, e-bikes and other non-motorized modes of transportation, as well as wheelchairs, motorized scooters or similar mobility assistance devices used exclusively by persons with disabilities.

"**Party**" means a party to this Permit and "**Parties**" means more than one of them.

"**Permit**" means this agreement, and all Schedules attached to it, as amended from time to time.

"**Permit Area**" means the area more particularly known and described as:

> In the Province of British Columba
> In Osoyoos Division of Yale District
>
> All of the Railway through Duck Lake Indian Reserve No. 7 as shown on Plan RR1222A recorded in the OKIB Lands Surveys Records in Ottawa.
>
> Containing about 17.36 acres (7.025 hectares).

"**Person**" includes any individual, partnership, firm, company, corporation, incorporated or unincorporated association or society, co-tenancy, joint venture, syndicate, fiduciary, estate, trust, bank, government, governmental or quasi-governmental agency, board, commission or authority, organization or any other form of entity however designated or constituted, or any group, combination or aggregation of any of them.

"**Release**" includes discharge, dispose of, spray, inject, inoculate, abandon, deposit, spill, leak, leach, seep, pour, emit, empty, throw, dump, place or exhaust.

"**Reserve**" means Duck Lake Indian Reserve No.7, which has been set apart for the use and benefit of OKIB.

"**Schedule**" means an attachment to this Permit labeled as a Schedule, which forms part of and is integral to the Permit.

"**Taxes**" means any tax of an Authority applicable to the granting of this Permit or the payment of Fees.

"**Term**" means the period starting on the Commencement Date and expiring on the date Kelowna no longer requires the Permit Area for any of the Authorized Uses, unless this Permit ends early.

"Willful Misconduct" means any act or failure to act (whether sole, joint or concurrent) by a Party that was intended to cause the harmful consequences to the safety or property of a Person which the Party knew, or should have known, would result from such act or omission.

"**Works**" means the components of the Okanagan Rail Trail that include the paved pathway, subgrade to the pathway, drainage system, road crossings, benches, pedestrian bridges, rock fall stabilization, erosion control, stormwater drainage components, fencing and trail signage. The works also include interpretive signage to communicate various natural issues, heritage and culture.

"**Works Area**" means the approximately four (4) metre wide portion of the Permit Area containing the former rail bed on which the Okanagan Rail Trail is to be constructed, as generally shown on the sketch attached as Schedule B.

2. INTERPRETATION AND GENERAL PROVISIONS

2.1 **Definitions** – Defined words are capitalized for ease of reference. A defined word may be read as having an appropriate corresponding meaning when it is used in the singular, plural, noun or verb form.

2.2 **Parts of the Permit** – These are the parts of this Permit: article (1.); section (1.1); subsection (1.1.1); and paragraph (1.1.1.1). Unless stated otherwise, any reference in this Permit to an article, section, subsection, or paragraph means the appropriate part of this Permit.

2.3 **Headings** – All headings in this Permit have been inserted as a matter of convenience and for reference only and in no way define, limit, enlarge, modify or explain the scope or meaning of the Permit or any of its provisions.

2.4 **Extended Meaning**

2.4.1 A word in the singular form may be read in the plural form if the context allows it and a word in the plural form may be read in the singular form if the context allows it. All genders are included in any gender expressed.

2.4.2 The words "include", "includes" and "including" are to be read as if they are followed by the phrase "without limitation".

2.4.3 The phrase "this Permit ends" includes an ending by expiration of the Term and an earlier termination. The phrases "earlier termination" and "early termination" include a surrender.

2.4.4 The phrase "on the Permit Area" includes in, under and above the Permit Area.

2.5 **Joint and Several** – If a Party is comprised of more than one Person, then all covenants and agreements of that Party are joint and several.

2.6 **Statutes** – Any reference to a statute means that statute, and any regulations made under it, all as amended or replaced from time to time.

2.7 **Governing Laws** – This Permit will be governed by and interpreted in accordance with the applicable Laws of OKIB and of the Province of British Columbia.

2.8 **Entire Agreement** – This Permit constitutes the entire agreement between the Parties with respect to the subject matter of this Permit and supersedes and revokes any and all previous discussions, negotiations, arrangements, letters of intent, offers and representations. There are no other covenants, agreements, representations or warranties between the Parties whatsoever other than those set out in this Permit.

2.9 **Modification** – Any modifications of this Permit will be in writing and executed in the same manner as this Permit.

2.10 **Time is of the Essence** – Time is of the essence in this Permit and time will remain of the essence notwithstanding any extension granted to a Party.

2.11 **Severability** – If any part of this Permit is declared or held invalid for any reason, the invalidity of that part will not affect the validity of the remainder of the Permit, which will continue in full force and effect and be construed as if this Permit had been executed without the invalid part.

2.12 **Survival of Obligations and Rights** – If a part of this Permit states that it survives when this Permit ends, then the survival of that part is only to the extent required for the performance of any obligations, and the exercise of any rights, pertaining to it.

2.13 **Others Performing Kelowna's Obligations** – Kelowna may allow any Person to perform Kelowna's obligations under this Permit, but in doing so Kelowna will ensure performance of such obligations by such Persons and it in no way affects Kelowna's obligation to perform.

3. USE OF THE PERMIT AREA

3.1 Kelowna's Rights to the Permit Area

3.1.1 Subject to every other part of this Permit, OKIB hereby authorizes the non-exclusive use of the Permit Area for the Term as follows:

3.1.1.1 On the Works Area, Kelowna, its employees, contractors, subcontractors, agents and invitees (including all members of the public) may:

(a) pass along and over and upon the Works Area for public recreation purposes;

(b) exercise the rights provided in paragraph 3.1.1.1.a by foot, bike, e-bike or other non-motorized modes of transportation as well as wheelchairs, motorized scooters or similar mobility assistance devices used exclusively by persons with disabilities;

(c) clear the Works Area and keep it clear of debris and anything which, in the opinion of Kelowna, constitutes or may constitute an obstruction to the Authorized Uses under this Permit;

(d) construct, operate and maintain the Works; and in the case of access for the purposes permitted under 3.1.1.1.c and this paragraph, such as for transporting material and equipment, by such methods of motorized vehicles as may be reasonably required; and

(e) carry out all activities necessary or incidental to the foregoing purposes.

3.1.1.2 On the Adjacent Area, Kelowna, its employees, contractors, subcontractors and agents may:

(a) enter, go, pass along, over and upon the Adjacent Area for the purpose of access to and egress from the Works Area; and

(b) clear the Adjacent Area and keep it clear of debris and anything which, in the opinion of Kelowna, constitutes or may constitute an obstruction to the Authorized Uses under this Permit.

3.1.2 This is a license. The rights provided under this Permit do not, and will not be deemed to, convey or confer on Kelowna any title, fee, estate, or other right "in rem" in the Permit Area.

3.1.3 Kelowna will comply with all applicable Laws regarding this Permit, the Permit Area and any activity on the Permit Area and will require and ensure that any other Person on the Permit Area because of Kelowna's rights under this Permit also complies with all applicable Laws regarding this Permit, the Permit Area and any activity on the Permit Area.

3.1.4 Kelowna will not cause or permit any nuisance on the Permit Area.

3.1.5 Kelowna will not cause or permit the commission of any waste of the Permit Area.

3.2 **Prior Rights** – This Permit is subject to any existing interest or right given for or attaching to the Permit Area, whether or not Kelowna has notice of such prior interest or right.

3.3 **Subsequent Rights** – Kelowna acknowledges that OKIB may authorize further use and occupation of the Permit Area, subject to Kelowna's rights under this Permit. If OKIB authorizes any further use or occupation of the Permit Area, OKIB will notify Kelowna of any such use or occupation.

3.4 **No Dispositions** – Kelowna must not assign, mortgage, or otherwise dispose of any of its interest in this Permit and any purported assignment, mortgage, or disposition is void.

3.5 **Representations about the Permit Area and its Authorized Use** – Kelowna acknowledges and agrees that OKIB is authorizing Kelowna's use of the Permit Area on an "as is – where is" basis and that OKIB, and its officials, servants, employees, agents, contractors, subcontractors or other legal representatives, nor the Council has made any representations or warranties with respect to:

3.5.1 the condition of the Permit Area or any improvements on the Permit Area, including the Permit Area's compliance with any Laws or the presence of Contaminants on the Permit Area;

3.5.2 issues of title or encumbrances affecting title; or

3.5.3 the suitability of the Permit Area for the Authorized Uses.

3.6 **Damage to, or Destruction of, Works** – Subject to section 3.7, if any Works are damaged or destroyed during the Term, then:

3.6.1 this Permit will not be deemed to have ended; and

3.6.2 Kelowna will repair or replace the Works within a reasonable time and, to the extent possible, to a standard at least substantially equal in quality of material and workmanship to the original material and workmanship.

3.7 **Damage to, or Destruction of Works by OKIB**

3.7.1 If any Works are damaged or destroyed by the negligence or Willful Misconduct of OKIB's employees in the course of carrying out their duties as an employee during the Term, then:

3.7.1.1 OKIB will promptly notify Kelowna of the damage; and

3.7.1.2 Kelowna will repair or replace the Works within a reasonable time and, to the extent possible, to a standard at least substantially equal in quality of material and workmanship to the original material and workmanship, the reasonable costs of which will be paid by OKIB to Kelowna.

3.7.2 If, to OKIB's knowledge, any Works are damaged or destroyed by the actions of OKIB's contractors, subcontractors or agents during the Term, then:

3.7.2.1 OKIB will promptly notify Kelowna of the damage; and

3.7.2.2 Kelowna will repair or replace the Works within a reasonable time and, to the extent possible, to a standard at least substantially equal in quality of material and workmanship to the original material and workmanship and Kelowna acknowledges that OKIB will not be responsible for the costs of repair and replacement and will seek recovery of such costs from OKIB's contractor, subcontractor or agent.

3.8 **Repair & Maintenance –** OKIB will not be required to maintain or make any repairs to any Works. Kelowna will repair and maintain the Works in good order and condition in all respects in accordance with existing Okanagan Rail Trail standards from time to time, provided that Kelowna will not use pesticides or herbicides in doing so.

4. PAYMENTS TO OKIB

4.1 **Payments** – All payments made by Kelowna to OKIB under section 4.3 of this Permit will be:

4.1.1 paid in Canadian dollars;

4.1.2 paid to OKIB;

4.1.3 paid without any prior demand, set-off, deduction or abatement; and

4.1.4 accompanied by any applicable Taxes.

4.2 **Prepaid Fees** - Kelowna paid Prepaid Fees of $10.00 to OKIB on the Commencement Date, the receipt and sufficiency of which are hereby acknowledged by the parties.

4.3 **Amounts Owing to OKIB** – If, at any time before or after this Permit ends, OKIB incurs any expenses by reason of any failure of Kelowna to perform or observe any of Kelowna's obligations under this Permit, then the amount of each expense, together with interest, accruing from thirty (30) days after receipt of notice of the expense from OKIB, and an administration fee of 15% of the expenses, will be payable to OKIB by Kelowna.

4.4 **Arrears to Bear Interest** – If any sum owing to OKIB by Kelowna under this Permit is not paid when due, then Kelowna will pay interest on the unpaid amount at the prime lending rate established by the Bank of OKIB, calculated quarterly and compounded semi-annually, plus 5% per annum, from the date the amount owing or sum are due until the date that the payment is received. This stipulation for interest will not prejudice or affect any remedies of OKIB under this Permit or otherwise, or be construed to relieve Kelowna from any default in paying any other sum at the time and in the manner specified in this Permit.

4.5 **Survival of Article** – This Article survives when this Permit ends.

5. CONSTRUCTION

5.1 **No Construction or Removal Before Review** – Before beginning any Construction or removal of any Works on the Permit Area, or altering the Permit Area in anticipation of such Construction or removal, Kelowna will arrange for an OKIB stewardship/environmental monitor to be present (at Kelowna's cost) during Construction or removal and Kelowna will:

5.1.1 apply to any appropriate Authority for, and obtain, any necessary approvals and authorizations; and

5.1.2 deliver to OKIB a Construction and Environmental Management Plan that indicates that, subject to any required mitigation, the Construction or removal of the Works is not likely to cause any significant adverse environmental effects on the Permit Area.

5.2 **Stop Work Orders and Injunctions** – If section 5.1 is breached, then, in addition to any other remedy available to OKIB:

5.2.1 OKIB may issue a "stop work order", which OKIB is entitled to post in conspicuous locations on the Permit Area;

5.2.2 OKIB may bar any Person performing any physical activity that is contributing to such breach from the Reserve until such time as the breach is rectified by obtaining all of the required approvals, authorizations and plans required under section 5.1;

5.2.3 Kelowna will promptly remediate any damage to the Permit Area and any other area on the Reserve arising from such breach; and

5.2.4 OKIB is entitled to obtain an injunction from a court of competent jurisdiction against the continuation of such breach, its costs which (including legal costs on a solicitor and own client basis) are to be paid promptly upon notice to Kelowna.

5.3 **Release of Liability** – Kelowna releases OKIB and its officials, servants, employees, agents, contractors, subcontractors and other legal representatives from any liability associated with their reviews of, and Kelowna's implementation of, any Construction and Environmental Management Plan. This section survives when this Permit ends.

5.4 **Construction Compliance** – Once all applicable approvals, authorizations and plans referred to in section 5.1 have been obtained, finalized or delivered, as the case may be, for any Works, Kelowna will:

5.4.1 promptly Construct such Works in a proper and workmanlike manner and in accordance with all required approvals, authorizations, plans and determinations and to at least the standards of the portions of the Okanagan Rail Trail located off-Reserve; and

5.4.2 ensure that the site preparation, Construction, operation and decommissioning of the Works, will comply with any mitigation measures, including monitoring and compliance, set out in the Construction and Environmental Management Plan.

5.5 **Plans** – After the completion of the Works, Kelowna will promptly deliver to OKIB a certificate from the City of Kelowna Engineer certifying that the Works have been constructed in accordance with the Construction and Environmental Management Plan and this Permit and that the standards referred to in subsection 5.4.1 have been met.

6. INSURANCE

6.1 Liability Insurance

6.1.1 Kelowna will obtain and maintain commercial general liability insurance against claims for bodily injury (including death), personal injury or property damage arising in connection with its use of the Permit Area. The policy will be written on a commercial general liability basis with liability limits of at least $5,000,000 per occurrence (or to any higher amount that OKIB reasonably requires by delivery of notice to Kelowna) and with OKIB as an additional insured.

6.1.2 The liability insurance policy will contain:

6.1.2.1 an agreement by the insurer that it will not cancel the policy without first giving the additional insured at least thirty (30) days prior notice; and

6.1.2.2 a waiver of subrogation by the insurers against the additional insured.

6.1.3 Kelowna will not do anything, or permit or suffer anything to be done that might cause the insurance policy to be invalidated or cancelled or that could affect the right of OKIB to recover for a loss.

6.1.4 On the Commencement Date, Kelowna will promptly deliver a certificate evidencing the insurance policy to OKIB, and will deliver to OKIB, at least fifteen (15) days before the expiry of any such insurance, a certificate of renewal, or other evidence satisfactory to each such party, that the insurance has been renewed or replaced.

6.1.5 Kelowna will, upon request from OKIB, deliver to OKIB a certified copy of every requested insurance policy.

6.2 **Release of Insured Claims** – Kelowna releases OKIB and OKIB's officials, servants, employees and other legal representatives from all liability for loss (including economic loss), damage or injury (including any loss, damage or injury that may arise out of the negligence or omission of any of them) in any way caused by or resulting from any of the perils or injury against which it has covenanted in this Permit to insure, except to the extent that such loss, damage or injury is caused by the negligence or Willful Misconduct of OKIB, or OKIB's officials, servants, employees, and other legal representatives in the course of carrying out their duties.

6.3 **Cancellation of Insurance** – Kelowna will immediately notify OKIB if any insurance policy required under this Permit is:

6.3.1 cancelled or threatened to be cancelled, and promptly deliver evidence of a certificate of renewal or other evidence satisfactory to such Party that the insurance has been renewed or replaced at least fifteen (15) days before the cancellation of such policy; or

6.3.2 suspended, and promptly provide evidence to such Party that the policy has been reinstated or replaced.

7. ENVIRONMENT

7.1 Compliance with Environmental Laws

7.1.1 Kelowna will not carry out any operations or activities, or construct any Works, that in the reasonable opinion of OKIB materially increase the risk of liability to OKIB (whether directly or indirectly) as a result of the application of Environmental Laws.

7.2 **Environmental Matters**

7.2.1 Kelowna will provide OKIB with certification from the City of Kelowna Engineer of the implementation, within the timelines specified in such determination, of all mitigation measures, including monitoring and compliance, required under such determination.

7.3 **Environmental Site Assessment**

7.3.1 Tetra Tech Canada Inc., a qualified independent consultant undertook an environmental site assessment of the environmental condition of the Permit Area and prepared a Human Health and Ecological Risk Assessment: CN Railway Right-of-Way Mile 105.9 to 106.6 and Mile 107.0 to 107.5 Duck Lake Indian Reserve 7, a copy of which is attached as Schedule C.

7.3.2 Within one hundred and twenty (120) days after the termination of this Permit, Kelowna will have a qualified independent consultant undertake an environmental site assessment of the environmental condition of the Permit Area at that time and will provide OKIB with a report on such condition. The report will state that it may be relied upon by all Parties and Kelowna agrees that all Parties may rely upon it.

7.3.3 The environmental site assessment reports referred to in subsections 7.3.1 and 7.3.2 will be *prima facie* evidence of the environmental condition of the Permit Area immediately prior to the Commencement Date and immediately prior to the expiration of this Permit or immediately after the earlier termination of this Permit, as the case may be.

7.3.4 Prior to the end of the Term, or within sixty (60) days after the issuance of the report referred to in subsection 7.3.2 if this Permit ends early, Kelowna will remediate any Contamination of the Permit Area arising from Kelowna's (or any Person on the Permit Area because of Kelowna's rights under this Permit) use of the Permit Area to the environmental condition of the Permit Area identified in the report referred to in subsection 7.3.1 or to such other environmental condition as may be acceptable to OKIB.

7.4 **Contaminants and Releases**

7.4.1 Prior to the end of the Term or within ninety (90) days after the earlier termination of this Permit, Kelowna will remove from the Permit Area any Contaminants that are, or have been, located, stored or incorporated on the Permit Area by Kelowna or any Person on the Permit Area because of Kelowna's rights under this Permit and, upon removal, will promptly provide OKIB with documentation satisfactory to each of them, confirming the completion of the removal satisfactory to each of them and any Authority.

7.4.2 Upon the Release of any Contaminants by Kelowna or any Person on the Permit Area because of Kelowna's rights under this Permit, Kelowna will:

7.4.2.1 immediately deliver notice to OKIB and any appropriate Authority of the occurrence of the Release;

7.4.2.2 ensure that any notice includes details relating to the Release, including the time and extent of the Release, the estimated amount of such

Contaminants, the remedial action taken prior to the delivery of the notice, and the remedial action that Kelowna intends to take in order to contain or rectify the Release;

7.4.2.3 immediately remove from the Permit Area such Contaminants, and take all remedial action necessary to fully rectify the effects of the Release, in compliance with all reasonable requests by OKIB and all applicable Environmental Laws;

7.4.2.4 provide OKIB with an environmental site assessment report, satisfactory to OKIB, prepared by a qualified independent consultant, specifying Kelowna's activities under paragraph 7.4.2.3 and the state of the Permit Area after the completion of such activities as compared to the state of the Permit Area prior to the Release, and stating that such report may be relied upon by all Parties, and Kelowna agrees that OKIB may rely on such report;

7.4.2.5 undertake such further activities as may reasonably require to remove such Contaminants and rectify the Release, based on the report referred to in this section; and

7.4.2.6 the Release of Contaminants in this section does not contemplate materials used for the regular operations and maintenance of the Okanagan Rail Trail for the permitted uses such as de-icing salt and sand for grit.

7.5 **Representation and Warranty** – Kelowna represents and warrants to OKIB that Kelowna's use of the Permit Area will not involve the Release of any Contaminants.

7.6 **Survival of Article** – This Article survives when this Permit ends.

8. DEFAULTS, EARLY TERMINATION AND END OF PERMIT

8.1 Defaults on Obligations Owed to OKIB

8.1.1 If Kelowna defaults on any obligation owed to OKIB under this Permit, then OKIB may deliver to Kelowna a default notice.

8.1.2 Kelowna will cure the default identified in a default notice within fifteen (15) days of delivery for a default of an outstanding payment under section 4.3 of this Permit. If Kelowna does not cure that default within fifteen (15) days, then OKIB may declare the Term ended by delivering a termination notice to Kelowna, with a copy to OKIB.

8.1.3 Kelowna will cure the default identified in a default notice within thirty (30) days of delivery for a default of any obligation other than an outstanding payment obligation. If such default:

8.1.3.1 can reasonably be cured within thirty (30) days after the default notice is delivered and Kelowna fails to cure such default within the thirty (30) days; or

8.1.3.2 cannot reasonably be cured within thirty (30) days after the default notice is delivered and Kelowna does not begin to cure such default within the thirty (30) days to the reasonable satisfaction of OKIB or continue to cure such default with due diligence after beginning to cure,

then OKIB may sue Kelowna for damages.

8.1.4 If a default is not cured within the time provided for under this Permit, then OKIB may cure that default in OKIB's sole discretion. Any of OKIB's expenses will be payable by Kelowna within thirty (30) days of delivery of notice from OKIB.

8.1.5 If OKIB begins to cure a default, then OKIB will have no obligation to continue to cure such default to completion and OKIB is not liable for any losses or expenses suffered by Kelowna, or any Person on the Permit Area due to the rights of Kelowna under this Permit, arising due to OKIB's actions under this section.

8.2 **Surrender of the Permit** – When this Permit ends, Kelowna will peaceably surrender and yield up use and occupation of the Permit Area to OKIB, in the condition required by the terms of this Permit and all Works will be the property of OKIB absolutely, free of all encumbrances and for no compensation.

8.3 **Permit Area No Longer Required –** If Kelowna determines that it no longer requires the Permit Area for any of the Authorized Uses, then Kelowna will give OKIB reasonable notice that this Permit will end on a date specified in the notice.

8.4 **Challenge by OKIB –** If OKIB determines that, in its view, the Permit Area is no longer required by Kelowna for any of the Authorized Uses, it may request that Kelowna give the notice required under section 8.3. If Kelowna declines to give the notice, or disputes that it is required, then the dispute may be submitted by any Party to the applicable dispute resolution process in Article 11.

9. INDEMNITY

9.1 **Kelowna's Indemnity of OKIB** – Kelowna will be liable for all loss, costs, damages, and expenses whatsoever incurred or suffered by OKIB and OKIB's elected officials, servants, employees and other legal representatives (the Additional Indemnities) including but not limited to damage to or loss of property and loss of use thereof, and injury to or death of a person or persons resulting from or in connection with a default of any of Kelowna's obligations under this Permit or the exercise by Kelowna of its rights or the performance, purported performance, or non-performance of activities under this Permit carried out or permitted by Kelowna, its workers, employees, agents, contractors subcontractors or invitees, excepting only where such loss, costs, damages and expenses are as a result of the negligence or Willful Misconduct of OKIB or the Additional Indemnities, in the course of carrying out their duties.

9.2 Kelowna will defend, indemnify and hold harmless OKIB and the Additional Indemnities from and against all claims, demands, actions, proceedings, and liabilities whatsoever and all costs and expenses incurred in connection with or resulting from a default of Kelowna's obligations under this Permit or the exercise by Kelowna of its rights or the performance, purported performance, or non-performance of activities under this Permit carried out or permitted by Kelowna, its workers, employees, agents, contractors subcontractors or invitees excepting only where such claim, demand, action, proceeding or liability is based on the negligence or Wilful Misconduct of OKIB or the Additional Indemnities, in the course of carrying out their duties.

9.3 **Survival of Article** – This Article survives when this Permit ends.

10. DELIVERY

10.1 **General Requirement** – All notices, requests, and demands under this Permit, which will be in writing, and all amount payable to OKIB will be paid, and will be delivered in accordance with this Article to the following addresses:

To OKIB:

Okanagan Indian Band
12420 Westside Road,
Vernon, BC V1H 2A4
Fax: (250) 542-4990

Attention: Chief

To Kelowna:

City of Kelowna
1435 Water Street,
Kelowna, BC V1Y 1J4
Fax: (250) 862-3399

Attention: City Clerk

10.2 **Date of Delivery** – If any question arises as to the date on which payment, notice, request or demand was made, it will be deemed to have been delivered:

10.2.1 if sent by fax, the day of transmission if transmitted before 3:00 p.m., otherwise, the next day;

10.2.2 if sent by mail, on the sixth day after the notice was mailed; or

10.2.3 if sent by any means other than fax or mail, the day it was received.

If the postal service is interrupted or threatened to be interrupted, then any payment, notice, request or demand will only be sent by means other than mail.

10.3 **Change of Contact Information** – Any Party may change its contact information shown in this Permit by informing the other Parties of the new contact information, and the change will take effect thirty (30) days after the notice is delivered.

11. DISPUTE RESOLUTION

11.1 Disputes

11.1.1 Any dispute arising from or under this Permit between OKIB and Kelowna will be resolved as follows:

11.1.1.1 Negotiation: The Party who wishes a dispute to be resolved will deliver a dispute notice to the other Party. Each Party will promptly designate a senior representative who will attempt in good faith to resolve the dispute by negotiation.

11.1.1.2 Mediation: If negotiation does not resolve the dispute within fifteen (15) days of delivery of the dispute notice, then either Party may deliver a

mediation notice to the other Party. The Parties will then promptly appoint a qualified, impartial and experienced mediator, the cost of which will be paid equally by both Parties. If the Parties cannot agree on a mediator within fifteen (15) days of delivery of the mediation notice, then the mediator will be appointed by the British Columbia International Commercial Arbitration Centre (or its successor, or a similar body if neither is available). Within ten (10) days of appointment of a mediator, each Party will provide the mediator and each other with a written statement of its position about the dispute and summary of the arguments supporting its position. The mediator will meet with the Parties in his or her sole discretion in an attempt to resolve the dispute. The Parties will provide any additional information requested by the mediator. The mediator may hire experts, the cost of which will be paid equally by the Parties unless the mediator orders a different division.

11.1.1.3 Arbitration: If the dispute is not resolved within thirty (30) days of the appointment of a mediator, then, on application by any Party, the dispute may be referred to a single arbitrator under the *Arbitration Act*, RSBC 1996, c 55. The decision of the arbitrator is final and binding on the Parties. The cost of the arbitrator will be paid equally by the Parties unless the arbitrator orders a different division.

12. MISCELLANEOUS

12.1 **All Terms are Covenants** – All agreements, terms, conditions, covenants, provisions, duties and obligations to be performed or observed under this Permit are deemed to be conditions as well as covenants.

12.2 **No Presumption** – There will be no presumption that any ambiguity in any of the terms of this Permit will be interpreted in favour of any Party.

12.3 **No Cost to OKIB** – Except as otherwise explicitly set out in this Permit, OKIB will not be responsible during the Term for any costs, charges or expenses arising from or relating to Kelowna's use or occupancy of the Permit Area or any of Kelowna's obligations under this Permit.

12.4 **Binding on Successors** – This Permit will be for the benefit of and be binding upon each Party's respective heirs, successors, executors, administrators, assigns and other legal representatives.

12.5 **Remedies are Cumulative** – Notwithstanding any part of this Permit that provides a remedy other than cancellation by OKIB or suing for damages by OKIB, all remedies under this Permit or at law may be exercised at the same time and the exercise of one remedy does not preclude the exercise of any other remedy.

12.6 **No Waiver** – No condoning, excusing or overlooking of any default of this Permit will operate as a waiver by, or otherwise affect the respective rights of, the other Parties in respect of any continuing or subsequent default. No waiver of these rights will be inferred from anything done or omitted to be done by any Party, except by an express waiver in writing.

12.7 **No Assumption of Responsibility** – No consent or absence of consent by OKIB will in any way be an assumption of responsibility or liability by such Party for any matter subject to or requiring such Party's consent.

12.8 **Not a Joint Venture** – Nothing in this Permit will be construed as creating a relationship of agency, partnership, joint venture or other such association between any of the Parties.

12.9 **Kelowna Authority** – Kelowna represents and warrants that:

12.9.1 it has the authority under the *Local Government Act* and/or the *Community Charter* of British Columbia to enter into this Permit and to perform all of the obligations, covenants and agreements contained in this Permit; and

12.9.2 Kelowna Council has consented to the issuance of this Permit, and authorized its signatories to execute this Permit on behalf of Kelowna.

12.10 **Counterpart Execution** – This Permit may be executed in one or more counterparts, each of which is considered to be an original but all of which together constitute one and the same document. Each Party will promptly deliver its originally executed Permit to the other Parties.

The Parties have executed this Permit on the dates indicated below.

On behalf of the OKANAGAN INDIAN BAND dated _____, 2023

_____
Chief – Byron Louis

_____
Witness

On behalf of the CITY OF KELOWNA dated _____, 2023

_____
Mayor Thomas Dyas

_____
City Clerk – Stephen Fleming

SCHEDULE "A" – Band and Council Resolution

WHEREAS:

A. Okanagan Indian Band has negotiated a Permit to be entered into between Okanagan Indian Band and City of Kelowna, to which this resolution is to be attached as a Schedule; and

B. The terms used in this resolution that are defined in the Permit have the same meaning as in the Permit.

BE IT RESOLVED that the Council, on behalf of Okanagan Indian Band:

A. has read and understood the Permit terms;

B. consents to the execution of the Permit on its terms; and

C. authorizes any two members of the Council to execute the Permit on behalf of OKIB.

DATED _____, 20___.

Quorum for the Council is _____ members.

_____
Chief

_____ _____
Councillor Councillor

_____ _____
Councillor Councillor

SCHEDULE "B" – Works Area

[See map attached next page]

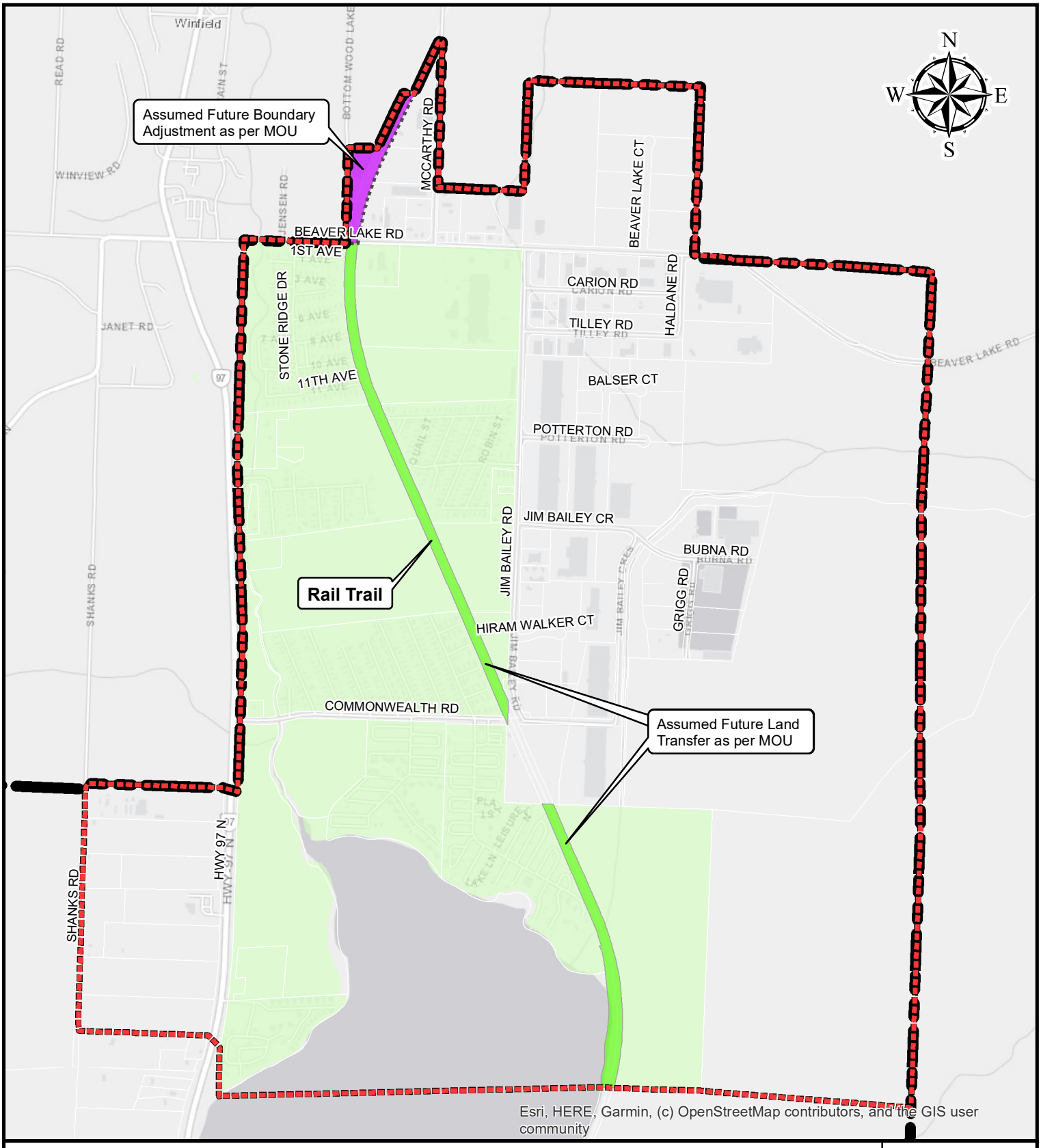

Figure A1. Beaver Lake Service Area (BLSA) - Rail Trail

Legend

- Lot Lines
- BLSA Boundary
- IR # 7
- City Boundary
- Assumed Future Boundary Adjustment as per MOU
- Assumed Future Land Transfer as per MOU

City of Kelowna

0 100 200 300
Meters

January 2023

SCHEDULE "C" – Environmental Site Assessment

[See Tetra Tech's Report titled "Human Health and Ecological Risk Assessment CN Railway Right-of-Way Mile 105.9 to 106.6 and Mile 107.0 to 107.5 Duck Lake Indian Reserve 7" on next page]

Human Health and Ecological Risk Assessment
CN Railway Right-of-Way Mile 105.9 to 106.6 and Mile 107.0 to 107.5 Duck Lake Indian Reserve 7

PRESENTED TO

OKANAGAN INDIAN BAND
INDIGENOUS AND NORTHERN AFFAIRS CANADA
CANADIAN NATIONAL RAILWAY

OCTOBER 2018
ISSUED FOR REVIEW
FILE: 704-ENW.VENW03093-02

This “Issued for Review” document is provided solely for the purpose of client review and presents our interim findings and recommendations to date. Our usable findings and recommendations are provided only through an “Issued for Use” document, which will be issued subsequent to this review. Final design should not be undertaken based on the interim recommendations made herein. Once our report is issued for use, the “Issued for Review” document should be either returned to Tetra Tech Canada Inc. (Tetra Tech) or destroyed.

Tetra Tech Canada Inc.
150, 1715 Dickson Avenue
Kelowna, BC V1Y 9G6 CANADA
Tel 250.862.4832 Fax 250.862.2941

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EXECUTIVE SUMMARY

Tetra Tech Canada Inc. (Tetra Tech) was retained by the Okanagan Indian Band (OKIB), Indigenous and Northern Affairs Canada (INAC) and Canadian National Railway (CN) to conduct a Human Health and Ecological Risk Assessment of the CN rail line right-of-way (RoW) that lies within the boundaries of the Duck Lake Indian Reserve (IR) 7 located near the northern limits of Kelowna, BC (the Site). This Human Health and Ecological Risk Assessment follows a Phase II Environmental Site Assessment (ESA) and a Phase III ESA completed for the Site by Tetra Tech in 2016 and 2017. In addition, groundwater data collected from groundwater monitoring wells installed in 2018 are included in the risk assessment.

The risk assessment addresses the polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons and copper identified by the Phase II and Phase III ESAs to be exceeding environmental quality guidelines and standards for the Site. The risk assessment considered the potential future uses of the Site as a recreational trail or industrial use.

Based on the results of the risk assessment the following conclusions were made.

Overall Human Health Conclusions and Recommendations

The contaminants of potential concern listed above were tentatively identified by screening against Canadian Council of Ministers of Environment (CCME) guidelines and BC Contaminated Sites Regulation (CSR) standards for residential, parkland, and commercial land uses. It is noted that for the contaminants of potential concern, the commercial guidelines and standards are equivalent to industrial guidelines and standards. The comparison eliminated all chemicals as being human health concerns, but the PAHs were further evaluated for their of total potency equivalents (TPE, a measure of risk posed by direct human contact) and potential to migrate to groundwater (Index of Additive Cancer Risk, IACR, a measure of risk posed to drinking water). The calculated upper 95th percent confidence limit of the mean (95UCL) concentrations for benzo(b)fluoranthene, benzo(a)pyrene, benzo(k)fluoranthene, benzo(g,h,i)perylene, and indeno(1,2,3-c,d) were used to determine the TPE. The IACR value was calculated using the same PAHs, as well as chrysene, dibenzo(a,h)anthracene, and benzo(a)anthracene.

The TPE totaled 0.042, well below the screening level of 5.3. Even if multiplied by 3 to account for the source of the PAHs (creosote) per CCME 2010 recommendations, the TPE is well below 5.3. Therefore, there is little potential for human health impacts from daily, long-term Site exposure. In addition, the IACR was calculated using the 95UCL concentrations of all PAHs, and it totalled 3.55. This is in excess of the guideline value of 1.0. The IACR value is used to indicate whether a potential for leaching to groundwater is present. Evaluation of the calculation shows that, in this case, benzo(b)fluoranthene is the COPC causing the exceedance of 1.0. However, groundwater samples collected from around the Site were non-detect for benzo(b)fluoranthene and the other PAHs, providing evidence that PAHs are not leaching to groundwater at levels of concern.

Given the site-specific determination that leaching to groundwater is not occurring, and that there are no risks to humans from direct contact with the soils, no further analysis is recommended, and no soil removal or remediation action is needed based on human health concerns.

Overall Ecological Conclusions and Recommendations

Results of this screening analysis indicate that the maximum concentrations in soil of some PAHs and copper exceed CCME guidelines and CSR standards for ecological receptors. Therefore, copper, as well as benzo(b)fluoranthene, benzo(a)pyrene, benzo(k)fluoranthene, benzo(g,h,i)perylene, and indeno(1,2,3-c,d) were further evaluated for ecological risk.

As with the human-health risk assessment, the 95UCL concentrations of these contaminants of potential concern were calculated and compared to guideline and standard values to determine if exceedances still existed. In all cases, the 95UCL concentrations were below the lowest guideline value for the protection of ecological receptors. There is no indication that the Site poses a hazard to ecological receptors.

In addition, it is unlikely that the limited areas of impacted soil would constitute a desirable habitat area for ecological receptors as they are located within purposely compacted soils that were intended to be free of vegetation for the safe operation of the former rail line. As well, they are unlikely to be contacted on an extensive basis by ecological receptors as past use did not encourage wildlife to the RoW. Most of the RoW is located at a distance greater than 10 m from a surface water body, and sampling data have demonstrated a lack of migration of all contaminants of potential concern from the surface to subsurface.

The relatively small areas of impact, difficult growing conditions, and low habitat quality due to compacted, shallow soil make it unlikely that the copper and PAHs will have a population-level effect on plants or invertebrates. The lack of plants providing a food source to mammals would also decrease the potential for foraging by herbivores. Further, the potential future use as a recreational trail calls for regrading and replacement of surface soil, diluting any exposure concentrations, as well as providing cover to deeper soil. By limiting the potential for contact, the exposure is no longer complete and there would be no associated risk.

In conclusion, the Site has been evaluated for human health risks and found to have little potential to adversely impact humans under residential, industrial, or recreational visitor scenarios. In addition, the Site has been evaluated for ecological risks and found to present little potential for adverse impacts to terrestrial or aquatic receptors. These conclusions are based on current site conditions as determined through soil and groundwater sampling, and are appropriate to potential future site use as a recreational trail, residential land use or industrial land use.

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APPENDICES

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Okanagan Indian Band, Indigenous and Northern Affairs Canada and Canadian National Railway and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Okanagan Indian Band, Indigenous and Northern Affairs Canada and Canadian National Railway, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by the Okanagan Indian Band (OKIB), Indigenous and Northern Affairs Canada (INAC) and Canadian National Railway (CN) to conduct a Human Health and Ecological Risk Assessment of the CN rail line right-of-way (RoW) that lies within the boundaries of the Duck Lake Indian Reserve (IR) 7 located near the northern limits of Kelowna, BC; specifically, CN Mile 105.9 to 106.6 and Mile 107.0 to 107.5. The subject lands are herein collectively referred to as the "Site" and a Site Location Plan is attached as Figure 1. This Human Health and Ecological Risk Assessment follows a Phase II Environmental Site Assessment (ESA) and a Phase III ESA completed for the Site by Tetra Tech in 2016 and 2017. Tetra Tech understands that these assessments were commissioned to determine the environmental condition of the Site prior to the land being transferred to the Federal Crown.

The methodology used is consistent with Canadian Council of Ministers of the Environment (CCME) guidance, Federal Contaminated Sites Action Plan (FCSAP) guidance and guidance from the government of British Columbia, and represents a conservative estimate of risks associated with potential exposures.

2.0 BACKGROUND INFORMATION

2.1 Site Description

The rails have been removed and the ties lifted from the RoW. The rail bed remains gravel surfaced and the areas along each side of the rail bed are sparsely vegetated.

A site plan is provided as Figure 2. The global positions of the approximate centres of the two sections of the Site are:

- Mile 105.9 to 106.6
  - -Latitude: 50° 0'49.52"N
  - Longitude: 119°23'46.12"W
- Mile 107.0 to 107.5
  - Latitude: 50° 0'8.43"N
  - Longitude: 119°23'15.62"W

Duck Lake IR 7 is located on each side of both sections of the RoW. The RoW bisects the Reserve from the approximate centre of the northern portion to the southeast corner of the northern portion; and runs along the east side of Ellison Lake (locally known as Duck Lake) in the southern portion. The northern portion of the Reserve is generally flat, and is surrounded by residential land along the west of the railway, and residential and light industrial land along the east. The southern portion of the Reserve contains a hilly, vacant area east of the RoW, and residential land and Duck Lake west of the RoW.

2.2 Previous Environmental Investigations

Detailed reports of previous environmental investigations can be found in the Phase II ESA (Tetra Tech 2016) and Phase III ESA (Tetra Tech, 2017). Tables containing all soil sampling results from the 2016 and 2017 field activity and figures showing sampling locations can be found in Appendix A. Soil sample location plans are also provided in Appendix A.

The Phase II ESA found that concentrations of the following substances exceeded the Canadian Council of Ministers Environment (CCME) residential land (RL), park land (PL), and commercial land (CL) guidelines in surface soil samples collected along former rail bed within the Site:

Substance	CCME Guideline Exceeded
Copper	CCME RL/PL and CL Guidelines
Naphthalene	CCME RL/PL and CL Guidelines
Phenanthrene	CCME RL/PL and CL Guidelines
Benzo(b)fluoranthene	CCME RL/PL Guideline
Benzo(k)fluoranthene	CCME RL/PL Guideline
Indeno(1,2,3-c,d)pyrene	CCME RL/PL Guideline
Benzo(a)pyrene Total Potency Equivalent	CCME RL/PL and CL Guidelines
Index of Additive Cancer Risk (IACR)	CCME RL/PL and CL Guidelines
Petroleum Hydrocarbon Fraction F3 (PHC F3)	CCME RL/PL Guideline

Evaluating the Phase II ESA results against the British Columbia Contaminated Sites Regulation (CSR 2017) standards, found that only copper, benzo(b)fluoranthene, and indeno(1,2,3-c, d)pyrene exceeded the CSR RL/PL standards at a few surface soil sample locations only. No substance concentrations exceeded the CSR CL standards.

Step-out soil sampling and analysis conducted during the Phase III ESA confirmed that the extent of copper and polycyclic aromatic hydrocarbon (PAH) impacted soil was restricted to the area of rail bed and embankments and within a depth of 0.4m below grade. Copper and PAH concentrations were less than the CCME RL/PL and CL guidelines and CSR RL standards in all soil samples collected beyond the rail bed and embankments but still within the RoW. Tetra Tech concludes that the contaminants of concern have not migrated laterally or vertically from the former location of the rail bed.

2.3 Groundwater Quality Investigation

Prior to completing this Risk Assessment, Tetra Tech monitored the installation of four groundwater monitoring wells (18MW01 to 18MW04) with the Site in March 2018. Groundwater monitoring well locations are shown on Figure B-1. Drilling and well installation methodologies and borehole logs are provided in Appendix C.

Depth to groundwater measurements collected on April 12 and June 6, 2018, found groundwater at depths ranging from approximately 7.5 m to 9.2 m below grade at 18MW01, 18MW02, and 18MW04. At 18MW03, the depth to groundwater below grade was 1.28 m in April and 1.69 m in June. The groundwater elevation at this location is likely influenced by a creek that passes through this area before discharging to Duck Lake. Flooding has reportedly occurred at this location in the past. Depth to groundwater measurements collected by Tetra Tech are summarized in Table B-1.

BC MoE Observation Well No. 356 is believed to be located on the Property based on the Provincial Groundwater Observation Well Network mapping. Water level measurements collected from Observation Well No. 356 between 2005 and 2015 indicated the groundwater table typically fluctuated less than 1 m over this period. The groundwater level data chart for this observation well is attached in Appendix B. Tetra Tech concludes there are not significant seasonal fluctuations in the groundwater level beneath the Site.

Groundwater samples were collected from 18MW01 to 18MW04 in April and June 2018, and analyzed for dissolved copper and PAHs. The groundwater sampling methodology is provided in Appendix C. The analytical results are summarized in Tables C-2 and C-3 with comparison to the Federal Interim Groundwater Quality Guidelines (FIGQG)

for Residential/Parkland Land Use (2016) for the protection of aquatic life, Guidelines for Canadian Drinking Water Quality (2017) and the BC CSR Generic Numerical Water Standards for the protection of aquatic life and drinking water. Groundwater quality within 10 m of surface water body is to be compared with the CCME Canadian Water Quality Guidelines (CWQG). For the contaminants of potential environmental concern at this Site, the CWQG are the same as the FIGQG.

PAH concentrations in the collected groundwater samples were less than the FIGQG for aquatic life, Health Canada drinking water guidelines and CSR aquatic life standards referenced in these documents. However, the concentration of PAH parameter dibenz(a,h)anthracene (0.017 µg/L did exceed the CSR drinking water standard of 0.01 µg/L in the duplicate groundwater sample from 18MW01 in June. The dibenz(a,h)anthracene concentration in the original June sample from 18MW01 and in all other original and duplicate samples collected in April and June were less than the CSR drinking water standard. Dibenz(a,h)anthracene was not identified as a contaminant of concern in soil samples collected from the Site. Tetra Tech concludes that dibenz(a,h)anthracene is not a contaminant of concern in groundwater beneath the Site.

Dissolved copper concentrations were less than the Health Canada drinking water guideline in all collected groundwater samples and less than the FIGWQ guidelines for protection of freshwater aquatic life in seven of the eight samples collected. While the April groundwater sample collected from monitoring well 18MW01 had a copper concentration less than the FIGQG for aquatic life, the June sample copper concentration exceeded. This single result is not suspected to be attributable to historical railway activities based on the other seven groundwater analytical results and non-detectable copper leachate concentrations obtained from leachate analyses conducted on copper impacted soil during the Phase III ESA. Further, it is noted that monitoring well 18MW01 is located more than 500 m away from Duck Lake and groundwater quality at this location is unlikely to adversely impact aquatic receptors in Duck Lake. In accordance with the Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites the protection of freshwater aquatic life can be excluded from consideration if dissolved phase contaminants are beyond 500 m of a downgradient surface water body.

Groundwater quality data collected by BC MoE from Observation Well No. 356 in 2014 and 2016 also showed dissolved copper concentrations less than the aquatic life and drinking water guidelines and standards and similar to those measured by Tetra Tech.

2.4 Scope of the Risk Assessment

The risk assessment presented for this Site consists of a problem formulation, screening of contaminants of potential concern (COPCs) against residential/parkland and commercial guidelines and standards, and quantitative risk assessment of COPCs retained after screening. The risk assessment was completed to assess the risks to human health and ecological receptors associated with the Site using the 2016 and 2017 analytical results for soil samples and the information provided in the 2017 Phase III ESA, prepared by Tetra Tech. As directed by OKIB, INAC and CN, this detailed quantitative risk assessment provides site-specific estimates of risk for receptors who may use the RoW for the following scenarios:

- Scenario No. 1: The Site is developed into a recreational trail and Federal soil and groundwater quality guidelines are applied. Details pertaining to the proposed construction of the recreational trail are provided in Appendix C.
- Scenario No. 2: The Site is developed into a recreational trail and Provincial soil and groundwater quality standards are applied.
- Scenario No. 3: The Site is used for industrial purposes and Federal soil and groundwater quality guidelines are applied.

A fourth scenario involving industrial use under Provincial soil and groundwater quality standards was considered; however, since none of the soil analytical results exceeded the BC CSR industrial land use soil quality standards, a risk assessment for this scenario is not required.

Potential ecological exposures are evaluated as well, and potential exposure through migration to groundwater and surface water are discussed.

It is not expected that the Site will be desirable to ecological receptors. First, the Site was used as a rail line for several decades and as such, soil compaction has occurred; this will discourage if not prevent plant growth and decrease populations of larger soil invertebrates. Second, given historical use, the RoW is not a grazing area, nor does it provide suitable nesting areas for most ecological receptors. Third, the area around the rail line has been developed for residential and commercial/industrial purposes. It does not present a desirable habitat for most higher-order ecological receptors as there are less developed, more natural areas nearby that are less impacted by human activity. Last, a proposed future use Site is a recreational trail, which would be maintained to allow hiking and biking; this will also limit the desirability of the strip of land for ecological receptors as would any commercial/industrial land uses. Nonetheless, ecological receptors were considered in the screening of COPCs.

3.0 REGULATORY GUIDELINES AND STANDARDS

The risk assessment scenarios consider both Federal environmental guidelines and provincial Contaminated Sites Regulation standards.

The analytical data collected during the Phase II and Phase III ESA's and the 2018 Groundwater Quality investigation were compared to generic numerical guidelines provided by the following documents:

- CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CSQG).
- CCME Canada Wide Standards for Petroleum Hydrocarbons (PHC) in Soil.
- CCME Canadian Water Quality Guidelines for Protection of Aquatic Life.
- Federal Contaminated Sites Action Plan (FCSAP) Federal Interim Groundwater Quality Guidelines (FIGQG).
- Health Canada Guidelines for Drinking Water Quality.
- BC Contaminated Sites Regulation Numerical Soil and Groundwater Standards.

3.1 Soil Quality Guidelines and Standards

CCME guidelines and CSR generic numerical standards were derived to protect human and ecological receptors based on generic scenarios developed for agricultural, residential/parkland, commercial, and industrial land uses.

For potential use of the Site as a recreational trail, RL/PL guidelines and standards are applicable. Therefore, the assessment of risk associated with recreational use of the Site also incidentally assesses the risk associated with residential use of the Site.

If the Site were to be used for industrial purposes, then industrial land use (IL) guidelines and standards are applied. It is noted that industrial use guidelines and standards are equivalent to commercial land use (CL) guidelines and standards for the potential contaminants of concern investigated. CL standards are therefore referenced interchangeably with industrial standards in this report.

In addition to land use, the following additional factors are considered when selecting CCME numerical soil quality guidelines:

- CCME guidelines for petroleum hydrocarbons include differing standards for fine and coarse-grained soil. “Coarse” means coarse-textured soil having a median grain size of > 75 µm and “Fine” means fine-textured soil having a median grain size of ≤ 75 µm; as defined by the American Society for Testing Materials. Based on visual observations of the material logged during testpitting and borehole drilling, the soil analytical results were compared to the more conservative guidelines for coarse grained soils.
- For PAHs naphthalene and phenanthrene, the CCME provides the option of applying either a guideline protective of aquatic life, or an alternative guideline if impact to freshwater surface water is not a concern. Based on the presence of Duck Lake, Tetra Tech determined it was appropriate to assess PAHs against the freshwater aquatic life protective guidelines.
- Two types of human health guidelines are provided for PAHs. Benzo[a]pyrene Total Potency Equivalents (B[a]P TPE) is a calculated value protective of direct contact with contaminated soil. The B[a]P TPE guideline selected for this project was based on an incremental lifetime cancer risk of 1 in 100,000 (10-5). This is consistent with risk-based standards applied provincially.
- The second human health guideline for PAHs is the Index of Additive Cancer Risk (IACR) which is protective of potable water resources. The Federal Interim Water Quality Guidelines defers to provincial guidelines for the requirement to protect groundwater for current or future use as potable water source. BC MoE and Climate Change Strategy Protocol 21 for Contaminated Sites: Water Use Determination (November 2017), indicates that standards protective of drinking water apply to a site if a drinking water supply is currently within 500 m of the site or if the aquifer underlying the site is suitable to supply drinking water based on the aquifer’s hydraulic conductivity, yield and water potability. As the BC MoE has mapped an aquifer beneath the Site that can potentially be a potable water source, Tetra Tech infers that guidelines and standards protective of potable water are applicable to the Site.

The CSR also provides Matrix Numerical Soil Standards for the assessment and remediation of soils. Matrix standards are risk-based standards that depend on land use and also a number of site-specific factors. The following CSR Matric Numerical Soil-Specific Factors are considered potentially applicable to the Site:

- Intake of contaminated soil.
- Toxicity to soil invertebrates and plants.
- Groundwater flow to surface water used by aquatic life.
- Groundwater used as drinking water.

3.2 Water Quality Guidelines and Standards

The FIGQG provide guidance on the application of federal standards to groundwater and receiving waterbodies. For groundwater greater than 10 m from a surface waterbody, the FIGQG will apply. For groundwater within 10 m of a surface waterbody, the Canadian Water Quality Guidelines for the Protection of Aquatic Life would apply. For the contaminants of concern for this Site, the FIGQG and the Canadian Water Quality Guidelines are equivalent. The FIGQG are issued as Tier 1 and Tier 2 standards. Tier 1 standards are generic numerical standards that may be directly applied to all sites. Tier 2 standards allow consideration of site-specific conditions and exposures, by removing exposure pathways that are not complete for the site of interest. Both have been used in this assessment, as Tier 1 standards are used as a first step in the screening process.

FIGQG also includes differing standards for fine and coarse-grained soil. As discussed above Tetra Tech has applied guidelines based on the presence of coarse-grained soil.

The FIGQG Tier 2 Guidelines contain standards for specific to water use, receptors, or exposure pathways. Tetra Tech has applied the most stringent of the Tier 2 Guidelines protective of Soil Organisms Direct Contact and Freshwater Life. For this Site, the most stringent FIGQG were the protection of freshwater aquatic life.

The FIGQG also provides guidance on the application of the Guidelines for Canadian Drinking Water Quality (GCDWQ). The GCDWQ are to be applied to protect potable water sources; while the guidelines are intended to be applied at the point of exposure (i.e., tap) the FIGQG recommend they be used when investigating groundwater that could be used as a drinking water source. The determination of a particular aquifer as a potable water source is under provincial jurisdiction. As discussed above, Tetra Tech has determined that drinking water guidelines should apply to the Site.

Similarly, CSR Generic Numerical Water Standards protective of freshwater aquatic life and drinking water have been applied to the analytical data collected from the Site.

4.0 IDENTIFICATION OF CONTAMINANTS OF POTENTIAL CONCERN

Those substances (specifically copper, PAHs, and PHC F3) whose maximum measured concentrations exceeded the CCME RL/PL and CL guidelines, or CSR RL/PL and CL numerical standards were then carried forward for further screening, specific to human or ecological receptors, to determine if pathways are complete and then to evaluate risks.

Data was summarized, providing minimum, maximum, frequency of detection, average concentrations, and the calculated 95th percent upper confidence limit of the mean (95UCL) concentration for each contaminant of potential concern (COPC). The 95UCL is used as the exposure concentration rather than the maximum detected concentration in the calculation of risk. For this assessment, all soil samples collected from the Site and analyzed were used. If duplicate samples were available, the higher of the original or duplicate analytical result was used for each analyte.

4.1 Contaminants of Potential Concern – Soil

Table 4-1 presents the maximum detected concentration of each metal detected in soil in the 2016 and 2017 sampling efforts. Table 4-2 presents the same information for PHCs and PAHs. Sample-specific results are included in Appendix B. Note that chemicals were retained as a COPC if they exceeded any of the guideline screening values. However, in the Phase II ESA, it was established that chromium, nickel, and zinc in soil were not contaminants of potential concern based on statistical analysis in accordance with MOE Technical Guidance 2 For Contaminated Sites; Statistical Criteria for Characterizing a Volume of Contaminated Material (January 2009), and they have not been carried forward in the risk assessment.

Table 4-1 COPC Selection for Metals in Soil

Chemical	Frequency of Detection	Maximum Detected Value (ug/g)	CCME RL	CSR RL	CCME - CL	CSR CL	COPC
Antimony	132/193	2.3	20	20	40	40	No
Arsenic	193/193	8.6	12	15 [#1]	12	15 [#1]	No
Barium	193/193	311	500	400 [#1]	2000	400 [#1]	No

Chemical	Frequency of Detection	Maximum Detected Value (ug/g)	CCME RL	CSR RL	CCME - CL	CSR CL	COPC
Beryllium	193/193	1.2	4	4	8	8	No
Boron	26/193	6	-	-	-	-	No
Cadmium	193/193	0.69	10	3 #1,2	22	25 #1,2	No
Chromium	193/193	78.5	64	60 #1	87	60 #1	**No (#3)**
Cobalt	193/193	24.8	50	50	300	300	No
Copper	193/193	239	63	150 #1,2	91	250 #1,2	**Yes**
Lead	193/193	49.7	140	400 #1,2	260	700 #1,2	No
Lithium	193/193	37.7	-	1600 #3	-	20,000	No
Manganese	193/193	882	-	1800 #3	-	19,000	No
Mercury	15/193	0.83	6.6	15 #1	24	40 #1	No
Molybdenum	193/193	5.5	10	10	40	40	No
Nickel	193/193	69.7	45	100	89	500	**No (#3)**
Selenium	24/193	0.72	1	3	2.9	10	No
Silver	24/193	0.3	20	20	40	40	No
Strontium	193/193	94.2	-	47,000 #3	-	100,000	No
Thallium	118/193	0.4	1	-	1	-	No
Tin	193/193	5.6	50	50	300	300	No
Uranium	193/193	3.83	23	16 #3	33	200	No
Vanadium	193/193	93.5	130	200	130	-	No
Zinc	193/193	506	200	450 #1,2	360	600 #1,2	**No (#3)**

NOTES:

#1 CSR Schedule 5 Matrix Numerical Soil Standard

#2 Standard is Ph dependent. Values shown based on a pH of 7.9

#3 Previously found in Phase II ESA to be not a COPC based on MoE Technical Guidance 2 for Contaminated Sites

- No guideline/standard exists

Table 4-2. COPC Selection for PHCs and PAHs in Soil

Parameter	Frequency of Detection	CCME - Residential/ Parkland	CCME - Commercial	CSR – RL/PL	CSR - CL	Maximum	COPC
2-methylnaphthalene	33/182	[18] #2	-	-	-	0.53	No
Acenaphthene	33/182	0.28	0.28	-	-	0.073	No
Acenaphthylene	64/182	320	320	-	-	1.07	No
Anthracene	84/182	2.5	32	-	-	1.43	No
Benz(a)anthracene	65/182	1	10	1	10	0.677	No
Benzo(a)pyrene	73/182	20	72	5	10 #1	1.3	**No**
Benzo(b)fluoranthene	85/182	1	10	1	10	2.52	**Yes**
Benzo(g,h,i)perylene	76/182	-	-	-	-	16.2	**Yes (#1)**

Parameter	Frequency of Detection	CCME - Residential/ Parkland	CCME - Commercial	CSR – RL/PL	CSR - CL	Maximum	COPC
Benzo(k)fluoranthene	69/182	1	10	1	10	1.14	**Yes**
Chrysene	75/182	[110] #2	-	-	-	1.72	No
Dibenz(a,h)anthracene	66/182	1	10	1	10	0.302	No
Fluoranthene	80/182	50	180	-	-	1.68	No
Fluorene	32/182	0.25	0.25	-	-	0.19	No
Indeno(1,2,3-c,d)pyrene	70/182	1	10	1	10	3.54	**Yes**
Naphthalene	36/182	0.013	0.013	5	50	0.271	**Yes**
Phenanthrene	49/182	0.046	0.046	5	50	0.864	**Yes**
Pyrene	67/182	10	100	10	100	1.72	No
B(a)P Total Potency Equivalent		5.3	5.3	-	-	1.09	No
B[a]P TPE multiplied by 3*		5.3	5.3			6.93	**Yes**
IACR (CCME)		1	1	-	-	31.6	**Yes**
Petroleum Hydrocarbons							
F3	22/158	300	1700	-	-	988	**Yes**
F4	2/158	2800	3300	-	-	241	No

Note: #1 Retained for further evaluation as a screening guideline is not available

Of the suite of metal parameters analyzed in soil during the Phase II and Phase III ESA's only copper concentrations exceeded the numerical soil quality guidelines and standards. Copper at a maximum concentration of 239 ug/g exceeded CCME residential/parkland screening guideline of 63 ug/g; the CSR residential/parkland numerical standard of 150 ug/g; and the CCME commercial land screening guideline of 91 ug/g. The CCME guidelines are based on the direct soil contact by invertebrates. The human health based CCME soil guidelines are 1,100 ug/g for residential/parkland and 4,000 ug/g for commercial lands. Therefore, copper, is further evaluated for risk to ecological receptors but not for human health risk.

Of the suite of PAH parameters analyzed in soil during the Phase II and Phase III ESAs, only concentrations of benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-c,d)pyrene, naphthalene, and phenanthrene exceeded the numerical soil quality guidelines and standards. Benzo(a)pyrene and benzo(g,h,i)perylene were also retained as COPCs for the risk assessment as these parameters are included in the B(a)P TPE and IACR calculated values, which also exceeded the CCME numerical guideline. Each PAH COPC is discussed below.

- **Benzo(b)fluoranthene** at a maximum concentration of 2.52 ug/g exceeded CCME guideline and CSR numerical soil quality standard of 1 ug/g. The human health-based CSR numerical standard is 50 ug/g, and based on this concentration benzo(b)fluoranthene is not of concern to humans. However, it was retained to estimate the risk posed by the B(a)P TPE and IACR calculated values. The maximum concentration exceeded the ecological screening value and, therefore, was retained as an ecological COPC, as well.

- **Benzo(g,h,i)perylene** was detected at a maximum concentration of 16.2 ug/g. There are no CCME and CSR screening values for this PAH, so it was retained for further evaluation. While there is no human health-based CCME guideline or CSR standard for benzo(g,h,i)perylene, the toxicity equivalency value listed in CCME 2010 is 0.01, which denotes the toxicity of benzo(g,h,i)perylene relative to benzo(a)pyrene. Therefore, the CSR soil quality guideline value for benzo(a)pyrene of 5 ug/g was adjusted for toxicity and a value of 500 ug/g was used for the screening of benzo(g,h,i)perylene. As the maximum concentration for benzo(g,h,i)perylene is far below this guideline, it is unlikely to pose a threat to human health. However, it was retained for an evaluation of risk posed by the B(a)P TPE and IACR calculated values. It was also retained for further evaluation in the ecological risk assessment.

- **Benzo(k)fluoranthene** at a maximum concentration of 1.14 ug/g marginally exceeded the CCME guideline and CSR numerical standard of 1 ug/g. This standard is based on ecological receptors. The CSR numerical standard for human health is 50 ug/g, and based on this value, benzo(b)fluoranthene is not a concern in the human health risk assessment. However, it was retained in the human health risk assessment for evaluation of risk posed by the B(a)P TPE and IACR calculated values. It was also retained in the ecological risk assessment for further evaluation.

- **Indeno (1,2,3-c,d) pyrene** at a maximum concentration of 3.54 ug/g exceeds the CSR numerical standard of 1 ug/g. This value is based on ecological receptors. The CSR numerical standard for human health is 50 ug/g, and based on this value, indeno(1,2,3-c,d)pyrene is not a concern in the human health risk assessment. However, it was retained in the human health risk assessment for evaluation of risks posed by the B(a)P TPE and IACR calculated values. It was also retained in the ecological risk assessment for further evaluation.

- **Naphthalene** – The maximum concentration of 0.271 ug/g exceeds the CCME guideline of 0.013 ug/g, which is based on the protection of freshwater life. However, there has been no detection of naphthalene in groundwater (discussed in the Section 3.2). Further, naphthalene was detected in only 36 out of 182 samples, indicating only localized surficial impacts over the entire length of the Site. Based on a lack of complete exposure pathway, the maximum concentration of naphthalene was compared to guidelines for soil and food ingestion pathways for ecological receptors of 8.8 ug/g (CCME 2008a) as no direct contact guideline for naphthalene is listed in CCME 2008a. As naphthalene is below this guideline, it was not retained as a COPC for ecological receptors. No human health guideline is available for naphthalene from CCME 2008a. Instead, a soil screening value of 11 ug/g (calculating using residential exposure values and toxicity values from Health Canada) was used to evaluate the potential for human impacts; as the maximum value was below this, naphthalene was not retained as a COPC for human health risks. Naphthalene concentrations in soil, therefore, do not pose an unacceptable risk for RL/PL and CL land uses.

- **Phenanthrene** – The maximum concentration of 0.414 ug/g exceeds the CCME guideline of 0.046 ug/g, which is based on the protection of freshwater life. However, there has been no detection of phenanthrene in groundwater (discussed in the Section 3.2). Further, phenanthrene was detected in only 49 out of 182 samples, indicating only localized surficial impacts over the entire length of the Site. Based on a lack of complete exposure pathway, the maximum concentration of phenanthrene was compared to guidelines for soil and food ingestion pathways for ecological receptors of 43.3 ug/g (CCME 2008a) as no direct contact guideline for phenanthrene is listed in CCME 2008a. As phenanthrene is below this guideline, it was not retained as a COPC for ecological receptors. No human health guideline is available for phenanthrene from CCME 2008a. Instead, a soil screening value calculated for residential exposures and toxicity values from Health Canada of 120 ug/g was used to evaluate the potential for human impacts; as the maximum value was below this, phenanthrene was not retained as a COPC for human health risks. Phenanthrene concentrations in soil, therefore, do not pose an unacceptable risk for RL/PL and CL land uses.

Therefore, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, and indeno(1,2,3-c,d) were retained for both the human health and ecological risk assessments.

The comparison of petroleum hydrocarbon detected values against the CCME screening values indicated that the maximum concentration of F3 was above residential/parkland screening levels. F2 was not detected, and F4 was detected only twice, at concentrations well below screening values. F3 was further evaluated.

- F3: The soil quality guideline of 300 mg/kg is based on direct contact of soil invertebrates and plants to F3. Out of 158 samples, PHC F3 was detected 22 times. Twelve of the 22 detected concentrations were above 300 mg/kg. Eleven of the detects were in the first 0.15 m soil depth and one was detected at 0.4 m. The data show that F3 is not migrating beyond a shallow depth. Given the localized nature of these detection, that the screening value is based on a decrease of soil invertebrates or plants at the population level, and that an average concentration would be far below the 300 mg/kg value, F3 was not retained as an ecological COPC. In addition, the human health-based guideline (residential land use) for PHC F3 is 15,000 mg/kg. The maximum detected F3 concentration is 988 mg/kg, far below the human health-based standard, and F3 was eliminated from further consideration in the human health risk assessment.

Table 4-3 presents the data summary of COPCs remaining after the screening of soil samples from 0 to 0.7 m depth interval collected in for the Phase II and Phase III ESAs in 2016 and 2017 from the length of the RoW within the Site. Minimum and maximum concentrations are shown, along with detection frequency and the mean of detected values. The data distribution was determined using ProUCL, which also produced a 95 UCL concentration that is used as an exposure concentration.

Table 4-3: Data Summary for COPCs in Surface Soil (0 – 0.7 m bgs)

Chemical	Minimum Concentration (ug/g)	Maximum Concentration (ug/g)	Frequency of Detection	Mean of Detects	95UCL	Distribution
Metals						
Copper	6.9	239	193/193	48.8	63.2	Not Discernable
Polycyclic aromatic hydrocarbons						
Chemical	**Minimum Concentration (ug/g)**	**Maximum Concentration (ug/g)**	**Frequency of Detection**	**Mean of Detects**	**95UCL**	**Distribution**
Benzo(a) pyrene	0.01	1.3	73/182	0.288	0.118	Lognormal
Benzo(b)fluoranthene	0.01	2.52	85/182	0.452	0.284	Gamma
Benzo(g,h,i) Perylene	0.021	16.2	76/182	1.765	0.881	Lognormal
Benzo(k) fluoranthene	0.011	1.14	69/182	0.234	0.122	Gamma
Indeno(1,2,3-c,d)pyrene	0.021	3.54	70/182	0.64	0.345	Gamma

4.2 Contaminants of Potential Concern - Groundwater

The following table includes the chemicals whose maximum concentrations exceeded the WQG as shown in Table 4-4. Four groundwater wells were installed, and the following samples were collected in April 2018. The samples were analyzed for copper and PAHs. Only copper and dibenzo(a,h)anthracene were detected, as shown below. Analytical results for groundwater are included in Appendix C.

Table 4-4. Groundwater Data

COPC	Frequency of Detection	Minimum Concentration	Maximum Concentration	Guideline Concentration	Guideline Source/Pathway	COPC?
Copper	8/8	0.00042 mg/L	0.00522 mg/L	0.002 mg/L	FIGQG for Freshwater Aquatic Life	No – As discussed below
Dibenzo(a,h) anthracene	1/4	0.017 ug/L	0.017 ug/L	0.26 ug/L	FIGQG for Freshwater Aquatic Life	No

Only one of the eight collected groundwater samples exceeded the FIGQG for freshwater aquatic life and this single sample was collected from groundwater monitoring well 18MW01 located more than 500 m upgradient of Duck Lake. As discussed in Section 2.3 this single result is not suspected to be attributable to historical rail way activities. In accordance with the Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites the protection of freshwater aquatic life can be excluded from consideration if dissolved phase contaminants are greater than 500 m away from a downgradient surface water body. Therefore, copper in groundwater is not considered to be a contaminant of potential concern.

The measured dissolved copper concentrations were also below the Health Canada Guideline for Drinking Water. Health Canada does not provide a drinking water guideline for Dibenzo(a,h)anthracene.

Tetra Tech concludes there are no COPCs in groundwater.

4.3 Other Environmental Media

Based on site history, samples collected for characterization and potential site reuse, it was determined that only soil and groundwater were media of concern. Soil vapour and indoor air are not media of concern because there are no volatile components for COPCs and no potentially complete exposure pathways; therefore, no samples were collected during this investigation for these media. Similarly, no fish tissue, plants, or wild game samples were collected as these pathways are not complete for this Site.

5.0 HUMAN HEALTH RISK ASSESSMENT

In Canada, risk assessment has been accepted by provincial and federal governments as a valid method to guide management decisions. The risk assessment methods for this assessment were based on the following guidance documents:

- British Columbia Ministry of Environment and Climate Change Strategy (BC MoE) Protocol 13 for Contaminated Sites: Screening Level Risk Assessment, Version 3, November 1, 2017.
- BC MoE Technical Guidance 7 for Contaminated Sites: Supplemental Guidance for Risk Assessment, Version 5.0, November 2017.
- BC MoE Technical Bulletin 2: Requirements for Human Health and Ecological Risk Assessments, September 15, 2015.
- Health Canada. 2010, updated 2012. Federal Contaminated Site Risk Assessment in Canada Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA).

- Health Canada. 2010. Federal Contaminated Site Risk Assessment in Canada Part II: Health Canada Toxicological Reference Values (TRVs).
- Health Canada. 2010. Federal Contaminated Site Risk Assessment in Canada Part V: Guidance on Human Health Detailed Quantitative Risk Assessment for Chemicals.
- Health Canada. 2011. Federal Contaminated Site Risk Assessment in Canada Supplemental Guidance: Checklist for Peer Review of Detailed Human Health Risk Assessments (HHRA).

5.1 Problem Formulation

The purpose of the Problem Formulation component is to identify the chemicals, receptors, and exposure pathways that are applicable for the Site. The COPCs were identified above; however, further refinement of the COPCs was completed to focus on parameters that are most applicable to the individual human health risk assessments for the potential future use scenarios of a hiking/biking trail or industrial land use.

The objective of the exposure pathway identification is to determine all the potential routes by which human receptors could be exposed to COPCs in contaminated media from the Site. The results of the Problem Formulation phase are summarized in the development of a conceptual site model (CSM) that depicts the exposure pathways and receptors.

Humans potentially impacted by the COPCs were identified under the proposed land uses. It is noted that use of the RoW in winter months as a path for snowmobiles could be possible. However, snow cover and cold-weather clothing would prevent contact with surface soils. Therefore, direct exposure to the RoW is assumed to likely to occur for 9 months per year rather than 12 months.

Table 5-1. Potential Receptors

Receptor	Age Group	Rationale
Worker	Adult (20+ years)	▪ Industrial use of the land is possible. Generally, workers are assumed to be adults only with an exposure time of 8 hours/day and 250 days/year for 35 years.
Recreational Trail Users	Adult (20+ years) Teen (12 -19 years) Child (5 - 11 years) Toddler (7 months to 4 years)	▪ Recreational visitors to the RoW are expected to spend no more than an hour at the site while passing through, walking or biking and may not have daily or long-term exposures; this would occur for up to 9 months per year due to snow cover or weather conditions.

5.2 Exposure Pathway Identification for Human Health

An exposure pathway is a mechanism by which a human receptor is exposed to chemicals from a source. Several possible exposure pathways may exist at a site. The following four elements constitute a complete exposure pathway:

- A source and mechanism of chemical release;
- A retention or transport medium;
- A point of potential receptor contact with the affected medium; and
- A means of entry into the body at the contact point.

Complete pathways represent situations where there is potential for receptors to be exposed to contaminants. Incomplete pathways represent situations where exposure or contact with the contaminant is unlikely to occur, therefore, risk to the receptor is negligible.

The CCME guidelines contain site-specific factors for soil. The possible site-specific factors for residential/parkland land use are as follows: direct contact (ingestion and dermal contact), vapour inhalation, protection of potable groundwater, protection of groundwater for aquatic life, ecological soil and food ingestion, nutrient cycling, ecological soil contact, and management limits. Nutrient cycling is indicated as “not calculated’ in CCME and, therefore, guidelines were not available at this time.

Of the pathways presented in the CCME soil guidelines, the human exposure pathways at the site are identified as complete or incomplete below.

5.2.1.1 Human Health – Soil Ingestion and Dermal Contact

Soil ingestion and dermal contact exceedance exist at the site for COPCs at or near the surface. People accessing the site currently or in the future may potentially be exposed to soil impacts. This exposure pathway would also be applicable for workers who could bring soil to surface. As such, this pathway is considered to be complete and was evaluated in this assessment.

5.2.1.2 Human Health – Vapour Inhalation

Subsurface vapours may migrate though soils and infiltrate into buildings (referred to as vapour intrusion) at distances up to 30 m from the PHC source (HC 2012). However, there are no buildings on the site and there were no volatile chemicals detected in surface soil. Therefore, this exposure pathway is considered incomplete and not further evaluated.

5.2.1.3 Human Health – Inhalation of Particulate Matter

Soil particles suspended in (outdoor) air would be expected to be inhaled by any people present on the Site. As such, this pathway is considered to be complete and was evaluated in this assessment.

5.2.1.4 Human Health – Drinking Water

The groundwater ingestion pathway is typically considered applicable if a Site is underlain by a potential domestic use aquifer or is within 500 m of a potential domestic use aquifer. BC MoE has mapped the underlying aquifer as a potential drinking water use aquifer. This exposure pathway is, therefore, considered potentially complete but drinking water was not further evaluated because there were no detected PAHs or dissolved copper in groundwater samples above drinking water guidelines (see Section 3.2). However, soil COPCs were evaluated as part of the IACR calculation.

5.2.1.5 Consumption of Berries, Plants, or Game

These exposure pathways consider ingestion of berries, plants, or wild game that may have accumulated COPCs from soil into their tissues. As the rail bed and location of impacted soil does not currently support plant growth, collection of berries or plants within the impacted area of the RoW does not occur. In addition, the RoW is not a desirable habitat due to lack of vegetation and previous use that has compacted the soil. It is adjacent to populated areas, and as such, would not be suitable for hunting. Therefore, consumption of berries, plants, and game exposure pathways were not retained for evaluation in the human health risk assessment.

5.2.1.6 Consumption of Fish

This exposure pathway considers consumption of fish that may have accumulated COPCs from surface water or sediment into their tissues. Migration of COPCs from the RoW has not been observed, and groundwater samples collected by Tetra Tech within 500 m of Duck Lake did not contain COPCs above CCME guidelines or CSR standards protective of aquatic life. Consumption of fish was, therefore, not retained for evaluation in the human health risk assessment.

5.2.1.7 Management Limits

As per CCME (2008b), PHC management limits must be applied at all soil depths if the ecological soil contact pathway has been eliminated. The management limit for PHC F3 is 2,500 mg/kg. There are no exceedances of the management limit of PHC F3 in surficial soils. A review of the individual factors considered by CCME in the development of the management limits has been reviewed relative to their applicability to the subject site as described below.

Free phase formation: Free phase PHC formation is undesirable because a free phase acts as a source of future contamination and may result in effects on indoor air quality and potable groundwater. No free-phase products have been identified on the ground surface in the area of the identified PHCs.

Effects on workers in trenches: Potential risks to humans working in trenches may occur since higher vapour infiltration rates occur in trenches compared with surface exposures. CCME (2008b) used a model to predict the influx of contaminant vapours into trenches. Exposure to PHC vapours for workers in trenches is a not concern with respect to the assessment of PHC F3 in soil, and therefore, this pathway is not complete.

Fire and explosive hazards: When PHC vapour concentrations exceed the lower explosive limit, combined with sufficient oxygen and an ignition source, a fire or explosive hazard exists. CCME (2008b) recommends a management limit for F3 of 2,500 mg/kg for coarse-grained soil for residential land use, and 3,500 mg/kg for commercial land use. Given the levels of identified PHC F3 soil impacts, a source of ignition is not likely to produce a fire hazard on this site.

Effects on buried infrastructure: Petroleum hydrocarbons can affect buried infrastructure, including underground utilities. There are no thresholds for F1 to F4 that would be protective of buried infrastructure. PHCs in the surface soils would not be in contact with deep buried utilities at the site, and therefore, have not been included as a pathway. Shallow buried infrastructure is unlikely at this site, given the compacted soil, projected reuse and the existing infrastructure already in place. Therefore, this is not likely a concern.

Aesthetic considerations: Aesthetic considerations at a site include odours, visible impacts on soils, and effects on the taste of potable water (CCME 2008b). PHC-impacted soil at this site is located at depths from surface to 0.4 mbgs. Odours are also not considered a concern due to the location of the identified PHCs in an open exterior environment.

Technological factors (i.e., difficulty of some soils to naturally bioremediate): The primary technological factor to be considered at PHC-impacted sites is the ability for biodegradation to occur, since this is the preferred method for remediating PHC in soils. The management limit for technological factors is driven by the difficulty in developing bioremediation systems for PHCs in the F3 and F4 ranges and the consideration of toxicity of F3 to ecological receptors. Since the PHC F3 impacted areas noted are discrete, small, and well below management limits addressing these technological factors is not considered necessary at the site.

5.3 Results of the Problem Formulation

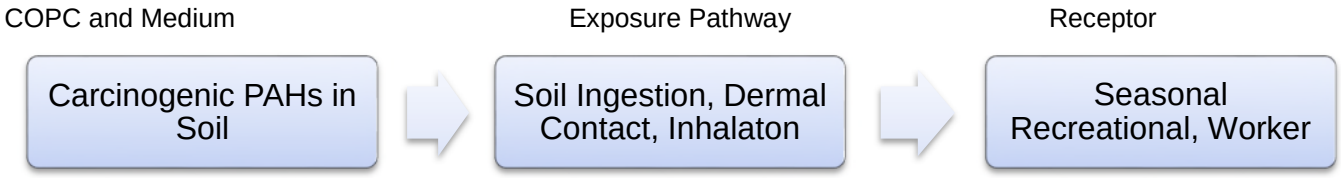
Below is a summary of the Human Health COPCs that remain after the problem formulation.

Table 5-2: Summary of COPCs

Remaining COPCs	Pathway Human Health
Benzo(a)pyrene	Soil Ingestion, Dermal Contact Inhalation as part of the B(a)P TPE
Benzo(b)fluoranthene	Soil Ingestion, Dermal Contact, Inhalation as part of the B(a)P TPE
Benzo(g,h,i)perylene	Soil Ingestion, Dermal Contact Inhalation as part of the B(a)P TPE
Benzo(k)fluoranthene	Soil Ingestion, Dermal Contact Inhalation as part of the B(a)P TPE
Indeno(1,2,3-c,d)pyrene	Soil Ingestion, Dermal Contact Inhalation as part of the B(a)P TPE
IACR	Further evaluation of potential for PAHs in soil to leach to groundwater

5.4 Conceptual Exposure Model

A summary of the contaminant transport mechanisms, potentially impacted media, receptors of concern, COPCs, and potentially complete exposure pathways is presented in a conceptual exposure model shown below. This model applies to both future land use scenarios. Only operable exposure pathways are identified and evaluated further in the risk assessment.



5.5 Exposure Assessment

The exposure assessment provides the exposure point concentration, a description of the likely exposures, and the parameters to be used in the assessment of risk. Each is described below.

5.5.1 Exposure Point Concentrations

The exposure point concentration represents the concentration to which the identified receptors could be exposed under the pathways determined in the problem formulation. COPCs were selected from the most recent two data sets, and for soil, all samples were collected from a depth of 0 mbg to 0.7 mbg. ProUCL v 5.02 (USEPA 2016) was used to summarize the data for each COPC, determine its distribution, and calculate an upper bound concentration (the 95 percent upper confidence limit of the mean, 95UCL) to be used as the exposure point concentration. ProUCL recommends a minimum of 10 discrete sampling results to adequately estimate an exposure point concentration; over 150 samples were available for this Site. The sampling results from both the Phase II ESA and Phase III ESA sampling investigations were combined for the selected COPCs to determine an exposure point concentration for each to be used for risk assessment purposes. In instances where duplicate samples were available, the higher of the original or duplicate sample was used as representative of site conditions, and was included in the calculation of the exposure point concentration. Individual sample results were entered into ProUCL v. 5.02 (USEPA 2016) and the following summary statistics were produced: mean of detected concentration, data distribution, and 95UCL concentration. The ProUCL output data is located in Appendix D.

After the COPC screening, only benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, and indeno (1,2,3-c,d) pyrene in soil were retained as potential COPC for the human health

risk assessment. While these components were not found to exceed individual CCME or CSR human health screening values, they were retained to evaluate the BaP TPE and IACR as shown in Tables 5-3 and 5-4, below.

The above PAHs, as well as benzo(a)anthracene, chrysene, and dibenzo(a,h)anthracene were retained to evaluate the IACR. The IACR assesses potential threats to potable groundwater quality from leaching of carcinogenic PAH mixtures from soil. Although groundwater has not been found to have been impacted as measured by sampling gin April and June 2018, this evaluation was conducted to be conservative. The IACR is calculated by dividing the soil concentration (numerator) of each carcinogenic PAH by its soil quality guideline for protection of potable water component value (denominator) to calculate a hazard index for each PAH, and then summing the hazard indices for the entire PAH mixture per CCME guidance (2010). The following equation was used for this calculation:

IACR =

Benzo(a)anthracene/0.33 mg/kg + Benzo(b+ k)fluoranthene/0.16 mg/kg + Benzo(g,h,i)perylene/6.8 mg/kg + benzo(a)pyrene/0.37 mg/kg + Chrysene/2.1 + Dibenzo(a,h)anthracene/.23 + Indeno(1,2,3-c.d)pyrene/2.7 mg/kg

Table 5-3 and 5-4 present the TPA and IACR calculated values, respectively, along with the minimum detected concentration, maximum detected concentration, and frequency of detection for each PAH.

Table 5-3: B(a)P TPE Assessment for Exposure Point Concentrations for Human Health COPCs

Chemical	Minimum (mg/kg)	Maximum (mg/kg)	Frequency of Detection	UCL (1) (mg/kg)	BaP TPE (2)
Benzo(a) pyrene	0.01	1.3	73/182	0.118	0.118
Benzo(b)fluoranthene	0.01	2.52	85/182	0.284	0.0284
Benzo(g,h,i) Perylene	0.021	16.2	76/182	0.881	0.00881
Benzo(k)fluoranthene	0.011	1.14	69/182	0.122	0.0122
Indeno(1,2,3-c,d)pyrene	0.021	3.54	70/182	0.345	0.0345
Benzo(a)anthracene (3)	0.01	0.677	65/182	0.0787	0.00787
				Total BaP TPE	**0.21**

(1) Distribution generated by ProUCL and used by the program to estimate a UCL for use as an exposure point concentration. The listed UCLs are the recommended values from ProUCL.

(2) BaP TPE calculated as (benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(benzo(g,h,i)perylene)(0.01)+(indeno(1,2,3-c,d)pyrene)(0.1)

(3) Benzo(a)anthracene UCL concentration based on gamma distribution as determined by ProUCL

Table 5-4: IACR Assessment for Exposure Point Concentrations for Human Health COPCs

Chemical	Minimum (mg/kg)	Maximum (mg/kg)	Frequency of Detection	UCL (1) (mg/kg)	IACR (2)
Benzo(a) pyrene	0.01	1.3	73/182	0.118	0.32
Benzo(b)fluoranthene	0.01	2.52	85/182	0.284	1.78
Benzo(g,h,i)perylene	0.021	16.2	76/182	0.881	0.13
Benzo(k)fluoranthene	0.011	1.14	69/182	0.122	0.76
Chrysene	0.01	1.72	75/182	0.137	0.065
Dibenzo(a,)anthracene	0.005	0.302	66/182	0.0303	0.13
Indeno(1,2,3-c,d)pyrene	0.021	3.54	70/182	0.345	0.13
Benzo(a)anthracene (3)	0.01	0.677	65/182	0.0787	0.24
				Total IACR	**3.55**

(1) Distribution generated by ProUCL and used by the program to estimate a UCL for use as an exposure point concentration. The listed UCLs are the recommended values from ProUCL.
(2) IACR calculated as [benzo(a)anthracene/0.33 mg/kg +benzo(a)pyrene/ 0.37 mg/kg + benzo(b)fluoranthene/0.16 mg/kg + benzo(k)fluoranthene/0.16 mg/kg + benzo(g,h,i)perylene/6.8 mg/kg + indeno(1,2,3-c,d)pyrene/2.7 mg/kg + chysene/2.1 mg/kg + dibenzo(a,h)anthracene/0.23 mg/kg]
(3) Benzo(a)anthracene, chrysene, and dibenzo(a,h)anthracene UCL concentration based on gamma distribution as determined by ProUCL

5.5.2 Exposure Parameters

As described in the problem formulation, human receptors identified included adult-aged residents, adult-aged workers, or seasonal recreational receptors. The recreational visitor is assumed to range in age from toddler to adult. It is anticipated that each of these receptors would be seasonal and temporary, as the site is planned for use as a recreational trail, but it would also be used by nearby residents more frequently, as well as being accessible to industrial purposes. All receptors were assumed to be present all months of the year and seven days per week, given the accessibility of the area. No adjustments were made for snow cover. The occasional visitor was assumed to be present two days/week for four months (32 days per year), using the trail when it is not snow-covered. Workers were also assumed to be present all year, and exposures are limited to adults only. However, the assessment of residential exposures will be protective of the recreational and industrial receptors, as well, as it assumes a more extensive and longer-term contact with the Site.

In the assessment of risks using the published guideline values, default exposure parameters applicable to residential receptors aged infant through adult are used. These were assumed to apply to the Site and were not changed. The residential assumptions used to assess exposures and estimate risks for this assessment as protective of all potential uses, as they include children, and represent a more extensive contact than either commercial or recreational exposures. The exposure parameters are listed below in Table 5-5.

Table 5-5: Exposure Parameters Appropriate to Site Exposures

Parameter	Adult (20+)	Teen	Child	Toddler
Exposure Time (hours)	8	8	8	8
Exposure Frequency (days)	Worker – 5 Resident – 7 Visitor – 2	7	7	7
Exposure (weeks/year)	Worker – 50 Resident - 52 Visitor – 16	52	52	52
Exposure Duration (years)	Worker – 35 Visitor – 80	80	80	80
Soil ingestion (g/day)	Worker – 0.1 Resident – 0.02 Visitor – 0.02	0.02	0.02	0.08
Body weight (kg)	70.7	59.7	32.9	16.5
Dermal Contact with soil	Hands, arms, and legs	Hands, arms, and legs	Hands, arms, and legs	Hands, arms, and legs
Inhalation rates (m^3/day)	16.6	15.6	14.5	8.3

5.6 Hazard Assessment

The hazard assessment is the process of identifying the relevant and appropriate toxicity values required for evaluating potential human health effects related to predicted exposures to COPCs. It involves identification of the

potentially toxic effects of the COPCs and the determination of the amount of the COPCs that can be taken into the body without experiencing adverse health effects. This evaluation is included as Appendix E for benzo(a)pyrene, which is considered carcinogenic by CCME and against which the relative potencies are established.

5.7 Risk Characterization

In risk characterization, the exposure dose is multiplied by the slope factor to provide a probability estimate of the outcome. For benzo(a)pyrene equivalents, the total potency equivalent is compared to the screening value of 5.3; the ratio of the two values provides an estimate of risk. The following sections describe methods to calculate only carcinogenic risk estimates, as non-carcinogenic parameters were not identified as COPC for the human health risk assessment. In addition, the IACR was calculated and evaluated to determine the potential for PAHs to impact groundwater per CCME guidance (2010).

5.7.1 Benzo(a)pyrene Risk Characterization

Risk estimates for the carcinogenic COPCs were developed by comparing the calculated BaP TPE to the screening value for residential land use. The value is 5.3 BaP TPE (CCME 2010). The following equation was used:

$$\text{Ratio} = \frac{\text{Site-Specific Bap TPE}}{\text{Screening Value for BaP TPE}}$$

The ratio was 0.21/5.3, or 0.04. Using the calculated BaP TPE and multiplying by 3 to account for the source of PAHs being the railroad ties per CCME guidance, the ratio is 0.63/5.3, or 0.12. These ratios are well below 1.0

When the ratio is greater than the 1.0, the scenario poses a potential concern and requires further evaluation or risk management. Here, the ratio is well below 1.0 and provides an adequate margin of certainty for all exposures. This is because of the conservative assumptions used in developing the BaP TPE screening value (residential exposure).

5.7.2 IACR Calculation and Risk Characterization

The IACR calculated using the equation presented in Section 4.5.1. CCME guidance requires this calculation to screen for potential leaching of PAHs from soil to groundwater, to ensure the protection of potable water sources. Table 5-4 contains this calculation, and the sum of all PAHs totaled 3.55, using the 95UCL exposure point concentration for all samples from the site. Benzo(b)fluoranthene had an IACR value above 1, and benzo(f)fluoranthene had a value of 0.76. The screening shows a potential for groundwater impacts. However, groundwater sampling has not detected these PAHs. As well, PAHs were detected only in the top 0.4 m of soil and do not appear to be migrating through soil. Further, site-specific modeling documented in the Phase III ESA report has shown little potential for leaching of PAHs to groundwater. Despite the exceedance of the guideline, site-specific information demonstrates that leaching is not a concern for this Site.

5.7.3 Risk Estimate Results

The concentrations and associated risks from PAHs at this Site are within the acceptable range when based on the 95 UCL concentration for each identified COPC. The calculated BaP TPE is far below the level of concern of 5.3 and the ratio of site to screening level TPE is far below 1.0. CCME guidance recommends that the B(a)P TPE be multiplied by 3 to account for the source of the PAHs and for PAHs that may be present but not detected; this value is 0.06 and is also well below the screening value of 5.3. Therefore, human health impacts are unlikely for this Site.

Further, the IACR was calculated using the 95UCL concentrations to determine a potential for leaching to groundwater. While the IACR total was above 1.0 (the screening value), this was due mainly to

benzo(b)fluoranthene and benzo(k)fluoranthene, neither of which were detected in groundwater samples nor were they often found below 0.4 m bgs. They were located within the railbed and were not detected in embankments or beyond, indicating very little potential for migration. Based on this analysis, it is not expected that PAHs will leach to groundwater and there is no threat to human health.

In addition, the planned reuse will not expose deeper soils, and will not result in exposures more extensive than assumed here. Residential land use is the most extensive exposure assumption for this RoW, and is protective of industrial uses, workers, or recreational exposures.

6.0 ECOLOGICAL RISK ASSESSMENT

The Ecological Risk Assessment was completed to assess risks to ecological receptors associated with soil impacts at the Site. It was completed for the protection of species at risk (SAR) at an individual level and non-SAR at a community/population level. The risk assessment methods for this assessment were based on the following guidance documents:

- Canadian Council of Ministers of the Environment. 1996. A Framework for Ecological Risk Assessment: General Guidance;
- Environment Canada. 2012a. Federal Contaminated Sites Action Plan (FCSAP) Ecological Risk Assessment Guidance;
- Environment Canada. 2012b. Federal Contaminated Site Action Plan (FCSAP) Supplemental Guidance for Ecological Risk Assessment – Standardization of Wildlife Receptor Characteristics; and
- British Columbia Ministry of Environment, Lands, and Parks. 1998. Protocol #1: Recommended Guidance and Checklist for Tier 1 Ecological Risk Assessment of Contaminated Sites in British Columbia.

6.1 Problem Formulation

The purpose of the Problem Formulation component is to identify how the chemicals, receptors, and exposure pathways interact at the Site. The COPCs were identified above in Section 3.0; however, further refinement of the COPCs was completed to focus on parameters that are most applicable to the ecological risk assessment. Individual pathways included in the guideline derivation for ecological health were reviewed for the current and surrounding land use – residential/parkland for ecological receptors.

Ecological receptors were selected by examining the activities that might occur under residential/parkland land use scenarios.

The objective of the exposure pathway identification is to determine all of the potential routes by which ecological receptors could be exposed to COPCs in contaminated media from the site. The results of the Problem Formulation phase are summarized in the development of a CSM that depicts the exposure pathways and receptors.

6.2 Ecological Receptors

A desktop biological inventory was completed in order to identify what plants and animals would likely be living at or foraging for food at the site, and potentially exposed to contaminated soils, groundwater and/or surface water at the site, using information from the British Columbia Ministry of Forests (1991). The results of this assessment are presented below. A basic summary of the plants and animals that may be present at the site is contained in the following paragraphs.

While there are many ecological species that could be present in a site setting, it is not practical to evaluate all species. Risk assessments must limit their focus on only some of the specific animals that might use a site. Representative receptors selected for the risk assessment are those that have the greatest potential for exposure, that play a key role in the food web, and that have sufficient characterization data to facilitate calculations of exposure and health risks. A receptor of concern is generally a single species which serves a surrogate for the other related species. The following criteria from CCME (1996) and Environment Canada (EC) (2012a, 2012b) were used to select the receptors evaluated in the risk assessment:

- Potentially sensitive to the substances identified at a site;
- Known or expected habitat of animals recognized by the government as threatened or endangered or of special concern;
- Year-round residents at a site;
- Migratory birds, where a significant proportion of the population is concentrated in the vicinity of a site during certain periods;
- Dominant within local biological communities, or functioning as keystone species within nearby ecosystems;
- Recognized as good indicators or surrogate species (i.e., representative of other similar organisms of a general type and feeding niche);
- Of aesthetic value or of value to the local human population; or
- Of recreational importance.

6.2.1 General Ecozone Evaluation

The Site is located in the Interior Plateau Region of British Columbia, specifically the Thompson-Okanagan Plateau. This ecozone encompasses the area of Kelowna, Kamloops, and Penticton. It is identified as the Interior Douglas-fir (IDF) zone with a continental climate characterized by warm, dry summers and cool winters. The land is characterized by rolling plateaus and major valley systems of the Okanagan, Thompson, and Nicola Rivers. The mean annual temperature of the IDF zone is approximately1 6°C to 9.5°C. The mean annual precipitation ranges 300 mm to 750 mm, and over 1000 mm in the wettest areas.

Vegetation in the zone is characterized by spruce, subalpine fir, and ponderosa pine while lower elevations are characterized by forests of ponderosa pine with grass understory, mixed with aspen, white spruce, and Douglas fir. Valley bottoms support open stands of Douglas fir, pine grass, ponderosa pine, as well as bluebunch wheatgrass and sagebrush. BC MoE classifies the region as Interior-Douglas fir with Montane spruce areas.

The range of wildlife in the Thompson-Okanagan Plateau is varied, and includes California big horn sheep, mule and white-tailed deer, elk, black bear, coyote, bobcat, cougar, wolverine, blue grouse, and waterfowl. Large carnivores include black and grizzly bear, bobcat, and cougar. Small predators include the coyote, badger and wolverine. The smaller herbivores include the golden-mantled ground squirrel northern pocket gopher, yellow-bellied marmot, southern red-backed vole, and red squirrel (BCMoF 1991, BCMoE 2018).

Reptiles and amphibians that may be present include the rubber boa, western rattlesnake, pacific tree frog, and the tiger salamander (in riparian areas) (BCMoF 1991, BCMoE 2018).

Some of the birds of prey in this area are the broadwinged hawk, Swainson's hawk, common nighthawk, and various owls. Waterfowl are the pacific, and red-throated loons, red-breasted merganser, and the various kinds of geese, ducks, and swan. Forest birds include the white-crowned, common, and yellow-billed sparrow, red-winged

blackbird, yellow warbler, song sparrow, America robin, and the barn swallow. Ground-dwelling birds include the spruce grouse, white-tailed ptarmigan, ring-neck pheasant, and gray partridge (BCMoE 2018).

Based on the site information, the areas surrounding the site provide a desirable habitat for some ecological receptor groups, such as small mammals and birds, as well as plants and soil invertebrates. However, the site itself is narrow, generally devoid of vegetation, and comprised of compacted and non-native soils as it was used for a rail way. Additionally, large mammals have a large enough home range that potential exposure to this Site would be limited. Aquatic ecological receptors are not being carried forward into the risk assessment, as there is no waterbody near the northern stretch of the RoW, continued sampling of the soil has shown little potential for COPC migration, and groundwater in the vicinity has not been impacted based on current groundwater samples.

6.2.2 Species of Concern

Risk assessment guidance recommends that species listed as rare, endangered, or threatened with habitats confirmed to be present within the study area or likely to be present in the future, be included as receptors in a risk assessment (EC 2012a).

Based on the Species at Risk Act (SARA), the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Species at Risk in British Columbia, there are a few threatened or species of special concern present in the region. In particular, there are many bird species that may be present in the area that are listed in SARA and COSEWIC (BCMoE 2018).

Terrestrial species listed as threatened or have special concern with a range that included the Site include the wolverine, grizzly bear, little brown myotis, fringed myotis, northern rubber boa, western skink, and western toad. Listed bird species include the barn swallow, yellow breasted chat, common nighthawk, western screech owl, olive sided flycatcher, banded tail pigeon, white-headed woodpecker, Williamson's sapsucker, and barn owl.

While this list of species at risk is varied, the impacted areas of the Site itself are not a desirable habitat and do not support vegetation, although vegetation is present on either side of the RoW. Given available and more desirable habitat nearby, limited size and location of the site (surrounded by residential and commercial developments in part) and the projected reuse including expanding the raised elevation and maintaining its use as a trail without vegetation, there is limited, if any, potential of exposure to listed species of concern to the site. Therefore, the identified species of concern in the region of the site do not need to be considered further.

6.3 Exposure Pathway Identification for Ecological Risk

An exposure pathway is a mechanism by which an ecological receptor is exposed to chemicals from a source. Several possible exposure pathways may exist at a site. The following four elements constitute a complete exposure pathway:

- A source and mechanism of chemical release;
- A retention or transport medium;
- A point of potential receptor contact with the affected medium; and
- A means of entry into the plant or animal at the contact point.

Complete pathways represent situations where there is potential for receptors to be exposed to contaminants. Incomplete pathways represent situations where exposure or contact with the contaminant is unlikely to occur, there risk to the receptor is negligible.

6.3.1 Soil

The CCME guidelines contain site-specific factors for soil. The site-specific factors for residential/parkland or industrial land use are as follows: direct contact (ingestion and dermal contact), vapour inhalation (slab-on-grade and basement), protection of potable groundwater, protection of groundwater for aquatic life, ecological soil and food ingestion, nutrient cycling, ecological soil contact, and management limits.

Of the pathways presented in the CCME soil guidelines, the ecological exposure pathways at the site are identified as complete or incomplete below.

6.3.1.1 Ecological Health – Soil Contact

The Site is not currently used but was used as a railway in the past. It is covered with gravel/compact soil consistent with that use. Vegetation (grasses, shrubs and trees) are located to either side of the RoW. The RoW may be snow covered during winter months. The ecological direct soil contact pathway is relevant for vegetation and soil invertebrates. Therefore, the ecological soil contact pathway is considered to be complete and was evaluated in this assessment.

6.3.1.2 Ecological Health – Freshwater Aquatic Life

The freshwater aquatic life pathway is applicable if a surface water body is located within 500 m downgradient of a site. In cases where the groundwater gradient is indeterminate, all surface water bodies within 500 m of the site are considered. This pathway is discussed as regards current soil and groundwater samples.

6.3.1.3 Ecological Health – Ingestion of Plants, Soil Invertebrates, and Prey

Plants and soil invertebrates can take up COPCs from soil into their tissues, which are then subsequently consumed by wildlife. Small mammals that are exposed to soil and food can also accumulate COPCs into their body. Therefore, food chain transfer was evaluated for birds and mammals.

6.3.2 Surface Water/Groundwater

Federal water quality guidelines for use at contaminated sites are applicable based on the proximity to surface waterbodies and drinking water, livestock watering or crop irrigation use. For groundwater within 10 m of a surface waterbody and for water samples collected directly from a waterbody, the CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life for the protection of aquatic life apply.

For groundwater greater than 10 m from a surface waterbody, the FIGQG apply. The FIGQG include site specific factors for groundwater including: inhalation, soil organism direct contact, freshwater life, marine life, irrigation, livestock, and wildlife watering. The pathways for marine life, irrigation, livestock were not considered further as they do not apply to the Site or its future use. For the contaminants of concern for this Site, the FIGQG and the Canadian Water Quality Guidelines are equivalent.

6.3.2.1 Ecological Health – Freshwater Aquatic Life

The freshwater aquatic life pathway is applicable if a surface water body is located within 500 m downgradient of a site. In cases where the groundwater gradient is indeterminate, all surface water bodies within 500 m of the site are considered. However, this pathway was evaluated by assessing the potential for COPCs to migrate or leach from soil, as well as collection of groundwater samples to determine the presence of COPCs in groundwater. Soil data has shown little evidence of COPC migration and little potential for leaching. Groundwater samples were collected, and only very low concentrations of copper and one PAH were detected; all detections were below drinking water

quality guidelines. Therefore, while chemicals in soil were identified that exceeded the soil screening levels (Table 6-1, below), no further evaluation was conducted because sampling has shown no leaching or migration, and no impacts to groundwater

6.3.2.2 Results of the Problem Formulation

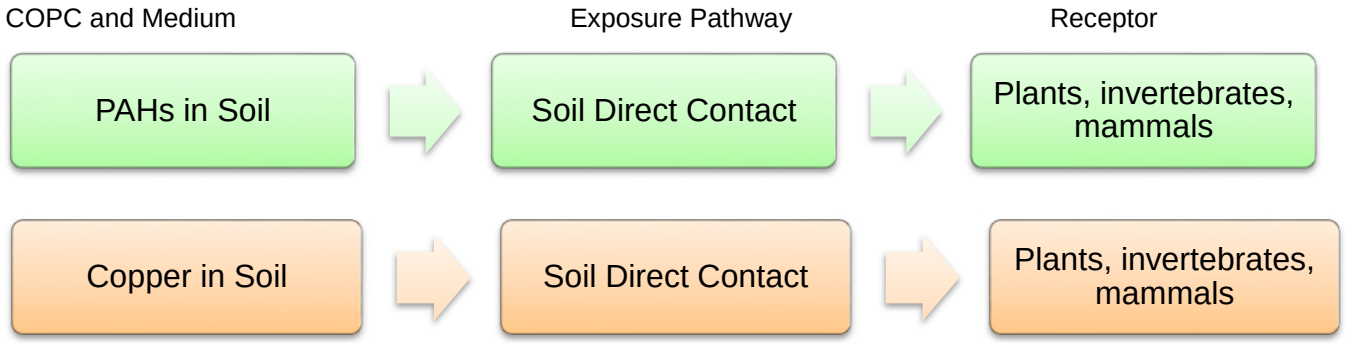
Below is a summary of the COPCs carried forward into the ecological risk assessment after the problem formulation. Bolded pathways have been carried forward.

Table 6- 1: Summary of COPCs

Remaining COPCs	Pathway	
	Terrestrial Ecological	Aquatic Ecological
Metals		
Copper	**Soil Organism Direct Contact Pathway is Complete**	Although soil concentrations exceed soil contact screening levels, Freshwater Life Pathway is not Complete and there is no indication that metals are leaching from soil
Polycyclic Aromatic Hydrocarbons		
Benzo(a)pyrene	**Soil Organism Direct Contact Pathway is Complete**	Although soil concentrations exceed soil contact screening levels, Freshwater Life Pathway is not Complete and there is no indication that metals are leaching from soil
Benzo(b)fluoranthene	**Soil Organism Direct Contact Pathway is Complete**	Although soil concentrations exceed soil contact screening levels, Freshwater Life Pathway is not Complete and there is no indication that metals are leaching from soil --
Benzo(g,h,i)perylene	**Soil Organism Direct Contact Pathway is Complete**	Although soil concentrations exceed soil contact screening levels, Freshwater Life Pathway is not Complete and there is no indication that metals are leaching from soil
Benzo(k)fluoranthene	**Soil Organism Direct Contact Pathway is Complete**	Although soil concentrations exceed soil contact screening levels, Freshwater Life Pathway is not Complete and there is no indication that metals are leaching from soil
Indeno(1,2,3-c,d)pyrene	**Soil Organism Direct Contact Pathway is Complete**	Although soil concentrations exceed soil contact screening levels, Freshwater Life Pathway is not Complete and there is no indication that metals are leaching from soil

6.4 Conceptual Exposure Model

A summary of the contaminant transport mechanisms, potentially impacted media, receptors of concern, COPCs, and potentially complete exposure pathways is presented in a Conceptual Exposure Model below. The exposure models would apply to the three land use scenarios outlined in the Section 5.0, but the most stringent criteria have been used herein to evaluate potential hazards.



6.5 Exposure Assessment

Similar to the human health risk assessment, the exposure point concentration represents the concentration to which the identified receptors could be exposed under the pathways determined in the problem formulation. COPCs were selected from the most recent two data sets, and for soil, all samples collected from a depth of 0 mbg to 0.7 mbg. ProUCL v 5.02 (USEPA 2016) were used to summarize the data for each COPC, determine its distribution, and calculate an upper bound concentration (the 95 percent upper confidence limit of the mean, 95UCL) to be used as the exposure point concentration. ProUCL recommends a minimum of 10 discrete sampling results to adequately estimate an exposure point concentration. The sampling results from both the Phase II and Phase III ESA sampling investigations were combined for the selected COPCs to determine an exposure point concentration for each to be used for risk assessment purposes. In instances where duplicate samples were available, the higher of the original or duplicate sample was used as representative of site conditions, and was included in the calculation of the exposure point concentration. Individual sample results were entered into ProUCL v. 5.02 (USEPA 2016) and the following summary statistics were produced: mean of detected concentration, data distribution, and 95UCL concentration. The ProUCL output data is located in Appendix D.

Table 6-2: Exposure Point Concentrations for Soil COPCs

Chemical	Minimum (mg/kg)	Maximum (mg/kg)	Frequency of Detection	UCL (1) (mg/kg)	Distribution
Metals					
Copper	6.9	239	193/193	63.2	Not Discernable
PAHs					
Benzo(a) pyrene	0.01	1.3	73/182	0.118	Lognormal
Benzo(b)fluoranthene	0.01	2.52	85/182	0.284	Gamma
Benzo(g,h,i) Perylene	0.021	16.2	76/182	0.881	Lognormal
Benzo(k)fluoranthene	0.011	1.14	69/182	0.122	Gamma
Indeno(1,2,3-c,d)pyrene	0.021	3.54	70/182	0.345	Gamma

(1) Distribution generated by ProUCL and used by the program to estimate a UCL for use as an exposure point concentration.

6.6 Hazard Assessment

The objective of the hazard (toxicity) assessment is to determine if chronic exposure of ecological receptors carries a risk of adverse health effects at the population level. For ecological receptors, the goal is not to protect each individual from any potentially toxic effect, but rather to protect enough individuals so that a viable population and community of organisms can be maintained (SAB 2006). To evaluate this, the calculated 95UCL exposure concentration was compared to the lowest available screening concentration for ecological receptors from CCME

and CSR. COPCs for the ecological assessment included chromium, copper, nickel, zinc; and the PAHs benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene and indeno (1,2,3-c,d) pyrene. As shown in Table 6-3, there are no exceedances of the guideline levels based on the 95UCL concentrations of any of these COPCs. Use of the 95UCL concentration is recommended in the Tier 1 Ecological Risk Assessment Policy Decision Summary (BC MOE 2018).

Table 6-3. Comparison of Exposure Point Concentration to Ecological Screening Levels

Chemical	UCL [(1)] (mg/kg)	Screening Level [(2)] (mg/kg)	Exceedance?	Ratio
Metals				
Copper	63.2	64	No	0.99
Benzo(a) pyrene	0.118	1	No	0.12
Benzo(b)fluoranthene	0.284	1	No	0.28
Benzo(g,h,i) Perylene	0.881	1	No	0.88
Benzo(k)fluoranthene	0.122	1	No	0.12
Indeno(1,2,3-c,d)pyrene	0.345	1	No	0.35

(1) As calculated by ProUCL using all samples from the Phase II and Phase III ESA soil sampling.
(2) Screening level is lowest value of CCME and CSR Residential/Parkland and Commercial Land Guideline levels.

6.7 Ecological Risk Characterization

Risk was evaluated for ecological receptors quantified by comparing the 95UCL concentrations to the ecological screening values in Table 6-3. The methodology used to calculate HQ values and the results are presented below.

6.7.1 Hazard Quotient Assessment

The potential for wildlife hazards can be estimated numerically using a HQ. A HQ is the ratio of the potential exposure to a single chemical to an estimated using the ecological screening level.

HQs were calculated for each COC-receptor combination as follows:

$$\text{Hazard Quotient} = \frac{\text{Soil concentration (mg/kg)}}{\text{Screening Level (mg/kg)}}$$

If the HQ is less than or equal to 1.0, the COPC is considered to pose a negligible hazard to the receptor. Hazard quotients in excess of 1.0 should be reviewed and consideration given towards the assumptions used to estimate exposure, and the uncertainty used to derive the screening level. The soil concentration used for the HQ calculation was the 95UCL as determined by ProUCL, using data from the Phase II and Phase III ESA sampling and the lowest ecological screening level from CCME and CSR were sued for this analysis.

No ratios were above 1.0. The ratio for copper was close to 1.0 but the likelihood of chronic exposure for plants and invertebrates to the RoW trail is low, given the intentionally compacted soil and desire to keep it free from vegetation. In addition, Individual samples for copper that exceeded the guideline of 63 mg/kg were:

16TP02

16TP28

16TP34

16TP36

16TP34-E1

16TP39-W1

All of these samples were within the former rail bed and none were beyond the embankments.

Note that the CSR guideline for residential/parkland is 150 mg/kg and it is 250 mg/kg for commercial land use; the 95UCL concentration for copper is well below these levels. The CCME commercial land us guideline is 91 mg/kg also higher than the calculated 95UCL exposure concentration.

6.8 Risk Characterization

Given the lack of exceedance of stringent guidelines based on the exposure concentrations, it is unlikely that the RoW poses a risk to ecological receptors.

As show in Table 4-1 and 4-2, the maximum concentration of copper exceeded the lowest screening levels available for this metal. The screening levels were based on effects to ecological receptors. After aggregating the available soil data and calculating a 95UCL exposure concentration, the exposure concentration was compared to the screening levels and copper did not pose a risk to ecological receptors at the population level (Table 6-3). As the exposure concentrations were below the lowest screening levels, no risks are expected for any ecological receptors including sensitive, protected or endangered species.

Similarly, the 95UCL concentrations for PAHs that were retained as COPCs were also below the lowest ecological screening concentrations. Again, there were no exceedances, indicating that there is little potential for impacts to ecological receptors from this Site.

While comparison of maximum detected concentrations to CCME and CSR guidelines for ecological receptors identified individual locations of exceedances for the COPCs, the relatively small areas of impact, difficult growing conditions and low habitat quality due to coarse and compacted soil make it unlikely that the any COPC will have a population-level effect on plants or invertebrates. In addition, the overall exposure point concentrations did not indicate a potential for hazard. The lack of plants providing a food source to mammals and birds would also decrease the potential for foraging by terrestrial mammals. Further, reuse plans should include retaining the compacted soil RoW for use as a trail, limiting plant growth or soil invertebrates in the contaminated media.

7.0 CONCLUSIONS

In conclusion, the Site has been evaluated for human health risks and found to have little potential to adversely impact humans under residential, industrial, or recreational visitor scenarios. In addition, the Site has been evaluated for ecological risks and found to present little potential for adverse impacts to terrestrial or aquatic receptors. These conclusions are based on current site conditions as determined through soil and groundwater sampling, and are appropriate to potential future site use as a recreational trail, residential land use or industrial land use.

8.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
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APPENDIX A
PHASE II ESA AND PHASE III ESA DATA

Table 2: Soil Quality Assurance/Quality Control Analytical Results

Parameter	Unit	RDL	16TP06	DUP01	RPD (%)	16TP11	DUP02	RPD (%)	16TP16	DUP03	RPD (%)	16TP22	DUP04	RPD (%)	16TP27	DUP05	RPD (%)
			0.7 m			0.7 m			0 m			0.7 m			0 m		
			11-Aug-2016			11-Aug-2016			12-Aug-2016			12-Aug-2016			12-Aug-2016		
Physical Parameters																	
pH	pH Units	0.1	7.5	7.6	1	7.4	7.4	0	8.1	7.8	4	7.3	8.1	10	8.5	8.8	3
Moisture	%	0.1	7.6	7.9	4	10.3	10.3	0	0.7	2.4	**110**	1.2	1.2	0	1.7	1.7	0
Metals																	
Antimony	µg/g	0.1	<0.1	<0.1	-	<0.1	<0.1	-	1.3	0.4	-	<0.1	<0.1	-	0.2	0.2	-
Arsenic	µg/g	0.4	1.3	1.4	-	1.3	1.2	-	4.1	3.2	25	0.7	0.7	-	2.3	2.1	9
Barium	µg/g	1	76	67	13	73	64	13	90	68	28	45	44	2	58	62	7
Beryllium	µg/g	0.1	0.4	0.4	-	0.4	0.4	-	0.2	0.2	-	0.3	0.2	-	0.2	0.2	-
Boron	µg/g	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
Cadmium	µg/g	0.04	0.08	0.08	-	0.10	0.09	-	0.47	0.36	27	0.05	0.05	-	0.18	0.17	-
Chromium	µg/g	1	23.8	24.7	4	24.1	22.4	7	34.0	28.8	17	15.1	15.2	1	22.9	20.0	14
Cobalt	µg/g	0.1	11.2	11.3	1	11.3	10.9	4	9.4	8.0	16	7.1	7.4	4	6.1	6.1	0
Copper	µg/g	0.2	12.2	13.2	8	11.7	12.4	6	113	60.8	**60**	6.6	7.2	9	25.7	29.2	13
Lead	µg/g	0.2	2.8	3.1	10	3.0	3.0	0	20.6	11.1	60	0.5	0.6	-	3.6	3.6	0
Lithium	µg/g	0.1	6.9	7.4	7	7.1	6.6	7	8.4	7.4	13	4.3	3.2	29	7.1	5.5	25
Manganese	µg/g	0.4	518	509	2	540	518	4	386	350	10	301	309	3	253	272	7
Mercury	µg/g	0.04	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-
Molybdenum	µg/g	0.1	0.7	0.7	0	0.8	0.8	0	1.9	1.6	17	0.9	1.0	11	0.7	0.8	13
Nickel	µg/g	0.4	18.7	18.9	1	18.7	17.7	5	29.6	28.7	3	11.5	14.6	24	18.8	18.4	2
Selenium	µg/g	0.5	<0.5	<0.5	-	<0.5	<0.5	-	0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
Silver	µg/g	0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	-
Strontium	µg/g	0.2	39.9	36.0	10	42.8	36.7	15	52.5	51.7	2	28.6	28.8	1	32.3	31.1	4
Thallium	µg/g	0.1	<0.1	<0.1	-	<0.1	<0.1	-	0.2	0.1	-	<0.1	<0.1	-	<0.1	<0.1	-
Tin	µg/g	0.2	0.5	0.6	-	0.5	0.5	-	2.1	1.3	47	0.4	0.4	-	0.3	0.4	-
Uranium	µg/g	0.1	0.7	0.8	13	0.7	0.7	0	0.7	0.8	13	0.5	0.5	0	0.5	0.5	0
Vanadium	µg/g	0.4	48.0	53.3	10	46.9	46.4	1	48.5	42.4	13	33.1	33.2	0.3	29.9	30.6	2
Zinc	µg/g	2	59	60	2	58	62	7	71	80	12	37	63	52	38	39	3
Hydrocarbons																	
F2 (C_{10}-C_{16})	µg/g	100	<100	<100	-	<100	<100	-	<100	<100	-	<100	<100	-	<100	<100	-
F2 (C_{10}-C_{16})-Naphthalene	µg/g	100	<100	<100	-	<100	<100	-	<100	<100	-	<100	<100	-	<100	<100	-
F3 (C_{16}-C_{34})	µg/g	200	<200	<200	-	<200	<200	-	268	<200	-	<200	<200	-	<200	<200	-
F3 (C_{16}-C_{34})-PAH	µg/g	200	<200	<200	-	<200	<200	-	259	<200	-	<200	<200	-	<200	<200	-
F4 (C_{34}-C_{50})	µg/g	200	<200	<200	-	<200	<200	-	<200	<200	-	<200	<200	-	<200	<200	-
Polycyclic Aromatic Hydrocarbons (PAHs)																	
2-methylnaphthalene	µg/g	0.01	<0.010	<0.010	-	<0.010	<0.010	-	0.026	0.026	-	<0.010	<0.010	-	<0.010	<0.010	-
Acenaphthene	µg/g	0.005	<0.005	<0.005	-	<0.005	<0.006	-	0.039	0.025	44	<0.005	<0.005	-	<0.005	<0.005	-
Acenaphthylene	µg/g	0.005	<0.006	<0.005	-	<0.006	<0.005	-	0.348	0.431	21	<0.007	<0.007	-	<0.006	<0.008	-
Anthracene	µg/g	0.004	<0.004	<0.004	-	<0.004	<0.004	-	0.739	0.867	16	<0.004	<0.004	-	<0.004	<0.004	-
Benz(a)anthracene	µg/g	0.01	<0.010	<0.010	-	<0.010	<0.010	-	0.585	0.634	8	<0.010	<0.010	-	<0.010	<0.010	-
Benzo(a)pyrene	ug/g	0.01	<0.010	<0.010	-	<0.010	<0.010	-	1.17	1.30	11	<0.010	<0.010	-	<0.010	<0.010	-
Benzo(b)fluoranthene	µg/g	0.01	<0.010	<0.010	-	<0.010	<0.010	-	2.08	2.52	19	<0.010	<0.010	-	<0.010	<0.010	-
Benzo(g,h,i)perylene	µg/g	0.02	<0.020	<0.020	-	<0.020	<0.020	-	2.96	3.54	18	<0.020	<0.020	-	<0.020	<0.020	-
Benzo(k)fluoranthene	µg/g	0.01	<0.010	<0.010	-	<0.010	<0.010	-	1.02	1.14	11	<0.010	<0.010	-	<0.010	<0.010	-
Chrysene	µg/g	0.01	<0.010	<0.010	-	<0.010	<0.010	-	1.50	1.72	14	<0.010	<0.010	-	<0.010	<0.010	-
Dibenz(a,h)anthracene	µg/g	0.005	<0.005	<0.005	-	<0.005	<0.005	-	0.224	0.279	22	<0.005	<0.005	-	<0.005	<0.005	-
Fluoranthene	µg/g	0.01	<0.010	<0.010	-	<0.010	<0.010	-	1.05	0.777	30	<0.010	<0.010	-	<0.010	<0.010	-
Fluorene	µg/g	0.01	<0.0100	<0.0100	-	<0.0100	<0.0100	-	0.058	0.040	37	<0.010	<0.010	-	<0.010	<0.010	-
Indeno(1,2,3-c,d)pyrene	µg/g	0.02	<0.020	<0.020	-	<0.020	<0.020	-	1.74	2.04	16	<0.020	<0.020	-	<0.020	<0.020	-
Naphthalene	µg/g	0.01	<0.010	<0.010	-	<0.010	<0.010	-	0.030	0.030	-	<0.010	<0.010	-	<0.010	<0.010	-
Phenanthrene	µg/g	0.02	<0.020	<0.020	-	<0.020	<0.020	-	0.281	0.149	61	<0.020	<0.020	-	<0.020	<0.020	-
Pyrene	µg/g	0.02	<0.020	<0.020	-	<0.020	<0.020	-	1.12	0.923	19	<0.020	<0.020	-	<0.020	<0.020	-
BaP TPE	µg/g	0.01	<0.010	<0.010	-	<0.010	<0.010	-	1.98	2.27	14	<0.010	<0.010	-	<0.010	<0.010	-
IACR	µg/g	0.062	<0.062	<0.062	-	<0.062	<0.062	-	27.1	31.6	15	<0.062	<0.062	-	<0.062	<0.062	-
Laboratory Identification Number			6080946-12	6080946-27		6080946-22	6080946-28		6081035-05	6081035-31		6081035-18	6081035-32		6081035-27	6081035-33	

NOTES:

- Not analyzed or RPD not calculated.
< Concentration is less than the laboratory detection limit indicated.
RDL Laboratory Reportable Detection Limit
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RPDs have only been considered where a concentration is greater than 5 times the RDL
BOLD High RPDs are in bold (acceptable RPD is 45% for metals in soil [60% for high variability metals] 75% for PAHs in soil, and 60% for EPH and other organics in soil as recommended by BC Ministry of Environment Q&A, and BC Environmental Laboratory Manual).
High variability metals include: Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, and Ti

Table 2: Soil Quality Assurance/Quality Control Analytical Results

Parameter	Unit	RDL	16TP06 0.7 m 11-Aug-2016	DUP01	RPD (%)	16TP11 0.7 m 11-Aug-2016	DUP02	RPD (%)	16TP16 0 m 12-Aug-2016	DUP03	RPD (%)	16TP22 0.7 m 12-Aug-2016	DUP04	RPD (%)	16TP27 0 m 12-Aug-2016	DUP05	RPD (%)
Volatile Organic Compounds (VOCs)																	
VH_{6-10}	µg/g	20	<20	<20	-	<20	<20	-	<20	<20	-	<20	<20	-	<20	<20	-
VPHs	µg/g	20	<20	<20	-	<20	<20	-	<20	<20	-	<20	<20	-	<20	<20	-
Benzene	µg/g	0.02	<0.02	<0.02	-	<0.02	<0.02	-	<0.02	<0.02	-	<0.02	<0.02	-	<0.02	<0.02	-
Bromodichloromethane	µg/g	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
Bromoform	µg/g	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
Carbon tetrachloride	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
Chlorobenzene	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
Chloroform	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
Dibromochloromethane	µg/g	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
1,2-Dibromoethane	µg/g	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
Dibromomethane	µg/g	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
1,2-Dichlorobenzene	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
1,3-Dichlorobenzene	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
1,4-Dichlorobenzene	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
1,1-Dichloroethane	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
1,2-Dichloroethane	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
1,1-Dichloroethene	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
cis-1,2-dichloroethene	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
trans-1,2-dichloroethene	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
1,2-Dichloropropane	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
1,3-Dichloropropene	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
Ethylbenzene	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
Methylene Chloride	µg/g	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
MTBE	µg/g	0.04	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-
Styrene	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
1,1,2,2-Tetrachloroethane	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
Tetrachloroethene	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
Toluene	µg/g	0.2	<0.20	<0.20	-	<0.20	<0.20	-	<0.20	<0.20	-	<0.20	<0.20	-	<0.20	<0.20	-
1,1,1-Trichloroethane	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
1,1,2-Trichloroethane	µg/g	0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
Trichloroethene	µg/g	0.01	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-
Trichlorofluoromethane	µg/g	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
Vinyl chloride	µg/g	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
Xylenes Total	µg/g	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
Laboratory Identification Number			6080946-12	6080946-27		6080946-22	6080946-28		6081035-05	6081035-31		6081035-18	6081035-32		6081035-27	6081035-33	

NOTES:

-	Not analyzed or RPD not calculated.
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BOLD	High RPDs are in bold (acceptable RPD is 45% for metals in soil [60% for high variability metals] 75% for PAHs in soil, and 60% for EPH and other organics in soil as recommended by BC Ministry of Environment Q&A, and BC Environmental Laboratory Manual).
	High variability metals include: Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, and Ti

Table 2: Soil Quality Assurance/Quality Control Analytical Results

Parameter	Unit	RDL	16TP06	DUP01	RPD (%)	16TP11	DUP02	RPD (%)	16TP16	DUP03	RPD (%)	16TP22	DUP04	RPD (%)	16TP27	DUP05	RPD (%)
			0.7 m			0.7 m			0 m			0.7 m			0 m		
			11-Aug-2016			11-Aug-2016			12-Aug-2016			12-Aug-2016			12-Aug-2016		
Herbicides, Pesticides and Fungicides																	
Alachlor	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
a-BHC	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
a-Chlordane	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Atrazine	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Azinophos methyl	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b-BHC	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromacil	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoxynil	µg/g	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Captan	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorothalonil	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorpyrifos	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanazine	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d-BHC	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deltamethrin	µg/g	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diazinon	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorvos	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diclofop-methyl	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethoate	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Disulfoton	µg/g	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diuron	µg/g	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan II	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan sulphate	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
g-BHC (Lindane)	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
g-Chlordane	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Linuron	µg/g	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malathion	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl parathion	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metolachlor	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metribuzin	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p,p-DDD	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p,p-DDE	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p,p-DDT	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parathion	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachloronitrobenzene	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phorate	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prometon	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ronnel (Fenchlorphos)	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Simazine	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfotepp	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tebuthiuron	µg/g	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temephos (Abate)	µg/g	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terbufos	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Triallate	µg/g	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trifluralin	µg/g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Identification Number			6080946-12	6080946-27		6080946-22	6080946-28		6081035-05	6081035-31		6081035-18	6081035-32		6081035-27	6081035-33	

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Table 2: Soil Quality Assurance/Quality Control Analytical Results

Parameter	Unit	RDL	16TP30	DUP06	RPD (%)	16BGR01	DUP07	RPD (%)	16TP35-0.7m	DUP08	RPD (%)	16TP39-0.7m	DUP09	RPD (%)
			0.7 m			0 m			0.7 m			0.7 m		
			15-Aug-2016			15-Aug-2016			15-Aug-2016			15-Aug-2016		
Physical Parameters														
pH	pH Units	0.1	7.7	8.0	4	6.9	6.9	0	8.4	8.2	2	7.8	7.9	1
Moisture	%	0.1	7.5	5.5	31	2.2	2.7	20	2.9	3	3	5.3	4.3	21
Metals														
Antimony	µg/g	0.1	<0.1	<0.1	-	<0.1	0.1	-	0.1	0.1	-	0.2	0.2	-
Arsenic	µg/g	0.4	1.0	0.9	-	1.5	1.9	-	2.1	1.7	-	3.0	2.9	3
Barium	µg/g	1	85	89	5	91	99	8	56	59	5	77	120	44
Beryllium	µg/g	0.1	0.4	0.3	-	0.4	0.5	-	0.3	0.2	-	0.4	0.4	-
Boron	µg/g	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
Cadmium	µg/g	0.04	0.09	0.09	-	0.14	0.18	-	0.20	0.18	-	0.18	0.21	-
Chromium	µg/g	1	22.6	22.0	3	17.3	16.4	5	15.2	21.8	36	23.4	25.3	8
Cobalt	µg/g	0.1	10.6	9.3	13	6.3	6.3	0	5.1	5.3	4	6.9	7.5	8
Copper	µg/g	0.2	13.1	10.5	22	12.7	14.1	10	14.0	14.2	1	25.1	23.8	5
Lead	µg/g	0.2	2.2	2.0	10	4.5	5.5	20	2.5	2.7	8	5.2	5.4	4
Lithium	µg/g	0.1	7.1	7.0	1	8.5	9.6	12	9.4	9.7	3	11.8	11.9	1
Manganese	µg/g	0.4	480	436	10	386	392	2	323	303	6	324	346	7
Mercury	µg/g	0.04	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-
Molybdenum	µg/g	0.1	0.9	1.2	29	1.6	0.4	-	0.4	0.3	-	0.7	0.6	15
Nickel	µg/g	0.4	18.1	17.2	5	12.1	13.2	9	13.2	14.4	9	18.8	19.6	4
Selenium	µg/g	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
Silver	µg/g	0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	-
Strontium	µg/g	0.2	48.7	46.2	5	19.5	27.9	35	29.3	23.5	22	24.1	31.6	27
Thallium	µg/g	0.1	<0.1	<0.1	-	<0.1	0.1	-	<0.1	<0.1	-	0.1	0.1	-
Tin	µg/g	0.2	0.5	0.5	-	0.3	0.4	-	0.3	0.3	-	0.5	0.5	-
Uranium	µg/g	0.1	0.7	2.0	**96**	0.7	0.9	25	0.4	1.0	-	2.0	0.9	**76**
Vanadium	µg/g	0.4	45.4	39.8	13	27.9	28.1	1	30.4	33.9	11	39.2	39.2	0
Zinc	µg/g	2	52	45	14	46	44	4	35	37	6	45	44	2
Hydrocarbons														
F2 (C_{10}-C_{16})	µg/g	100	<100	<100	-	-	-	-	<100	<100	-	<100	<100	-
F2 (C_{10}-C_{16})-Naphthalene	µg/g	100	<100	<100	-	-	-	-	<100	<100	-	<100	<100	-
F3 (C_{16}-C_{34})	µg/g	200	<200	<200	-	-	-	-	<200	<200	-	<200	<200	-
F3 (C_{16}-C_{34})-PAH	µg/g	200	<200	<200	-	-	-	-	<200	<200	-	<200	<200	-
F4 (C_{34}-C_{50})	µg/g	200	<200	<200	-	-	-	-	<200	<200	-	<200	<200	-
Polycyclic Aromatic Hydrocarbons (PAHs)														
2-methylnaphthalene	µg/g	0.01	<0.010	<0.010	-	-	-	-	<0.010	<0.010	-	<0.010	<0.010	-
Acenaphthene	µg/g	0.005	<0.005	<0.005	-	-	-	-	<0.006	<0.005	-	<0.005	0.006	-
Acenaphthylene	µg/g	0.005	<0.008	<0.005	-	-	-	-	<0.005	<0.005	-	<0.006	0.033	-
Anthracene	µg/g	0.004	<0.004	<0.004	-	-	-	-	<0.004	<0.004	-	0.007	0.093	-
Benz(a)anthracene	µg/g	0.01	<0.010	<0.010	-	-	-	-	<0.010	<0.010	-	<0.010	0.030	-
Benzo(a)pyrene	ug/g	0.01	<0.010	<0.010	-	-	-	-	<0.010	<0.010	-	<0.010	0.078	-
Benzo(b)fluoranthene	µg/g	0.01	<0.010	<0.010	-	-	-	-	<0.010	<0.010	-	<0.010	0.119	-
Benzo(g,h,i)perylene	µg/g	0.02	<0.020	<0.020	-	-	-	-	<0.020	<0.020	-	0.126	1.63	**171**
Benzo(k)fluoranthene	µg/g	0.01	<0.010	<0.010	-	-	-	-	<0.010	<0.010	-	<0.010	0.046	-
Chrysene	µg/g	0.01	<0.010	<0.010	-	-	-	-	<0.010	<0.010	-	<0.010	0.057	-
Dibenz(a,h)anthracene	µg/g	0.005	<0.005	<0.005	-	-	-	-	<0.005	<0.005	-	<0.005	0.020	-
Fluoranthene	µg/g	0.01	<0.010	<0.010	-	-	-	-	<0.010	<0.010	-	<0.010	0.041	-
Fluorene	µg/g	0.01	<0.010	<0.010	-	-	-	-	<0.010	<0.010	-	<0.010	<0.010	-
Indeno(1,2,3-c,d)pyrene	µg/g	0.02	<0.020	<0.020	-	-	-	-	<0.020	<0.020	-	<0.020	0.257	-
Naphthalene	µg/g	0.01	<0.010	<0.010	-	-	-	-	<0.010	<0.010	-	<0.010	<0.010	-
Phenanthrene	µg/g	0.02	<0.020	<0.020	-	-	-	-	<0.020	<0.020	-	<0.020	<0.020	-
Pyrene	µg/g	0.02	<0.020	<0.020	-	-	-	-	<0.020	<0.020	-	<0.020	0.059	-
BaP TPE	µg/g	0.01	<0.010	<0.010	-	-	-	-	<0.010	<0.010	-	<0.010	0.161	-
IACR	µg/g	0.062	<0.062	<0.062	-	-	-	-	<0.062	<0.062	-	<0.062	1.78	-
Laboratory Identification Number			6081116-10	6081116-29		6081116-03	6081116-30		6081116-20	6081116-31		6081116-28	6081116-32	

NOTES:

-	Not analyzed or RPD not calculated.
<	Concentration is less than the laboratory detection limit indicated.
RDL	Laboratory Reportable Detection Limit
RPD	RPD is Relative Percentage Difference calculated as RPD=[C2-C1]/[(C1+C2)/2] where C1,C2 = concentrations of parameters in 1st and 2nd sample respectively.
	RPDs have only been considered where a concentration is greater than 5 times the RDL
BOLD	High RPDs are in bold (acceptable RPD is 45% for metals in soil [60% for high variability metals] 75% for PAHs in soil, and 60% for EPH and other organics in soil as recommended by BC Ministry of Environment Q&A, and BC Environmental Laboratory Manual).
	High variability metals include: Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, and Ti

Table 2: Soil Quality Assurance/Quality Control Analytical Results

Parameter	Unit	RDL	16TP30	DUP06	RPD (%)	16BGR01	DUP07	RPD (%)	16TP35-0.7m	DUP08	RPD (%)	16TP39-0.7m	DUP09	RPD (%)
			0.7 m			0 m			0.7 m			0.7 m		
			15-Aug-2016			15-Aug-2016			15-Aug-2016			15-Aug-2016		
Volatile Organic Compounds (VOCs)														
VH_{6-10}	µg/g	20	<20	<20	-	-	-	-	<20	<20	-	<20	<20	-
VPHs	µg/g	20	<20	<20	-	-	-	-	<20	<20	-	<20	<20	-
Benzene	µg/g	0.02	<0.02	<0.02	-	-	-	-	<0.02	<0.02	-	<0.02	<0.02	-
Bromodichloromethane	µg/g	0.1	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-	<0.10	<0.10	-
Bromoform	µg/g	0.1	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-	<0.10	<0.10	-
Carbon tetrachloride	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
Chlorobenzene	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
Chloroform	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
Dibromochloromethane	µg/g	0.1	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-	<0.10	<0.10	-
1,2-Dibromoethane	µg/g	0.1	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-	<0.10	<0.10	-
Dibromomethane	µg/g	0.1	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-	<0.10	<0.10	-
1,2-Dichlorobenzene	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
1,3-Dichlorobenzene	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
1,4-Dichlorobenzene	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
1,1-Dichloroethane	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
1,2-Dichloroethane	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
1,1-Dichloroethene	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
cis-1,2-dichloroethene	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
trans-1,2-dichloroethene	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
1,2-Dichloropropane	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
1,3-Dichloropropene	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
Ethylbenzene	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
Methylene Chloride	µg/g	0.1	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-	<0.10	<0.10	-
MTBE	µg/g	0.04	<0.04	<0.04	-	-	-	-	<0.04	<0.04	-	<0.04	<0.04	-
Styrene	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
1,1,2,2-Tetrachloroethane	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
Tetrachloroethene	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
Toluene	µg/g	0.2	<0.20	<0.20	-	-	-	-	<0.20	<0.20	-	<0.20	<0.20	-
1,1,1-Trichloroethane	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
1,1,2-Trichloroethane	µg/g	0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	-	<0.05	<0.05	-
Trichloroethene	µg/g	0.01	<0.01	<0.01	-	-	-	-	<0.01	<0.01	-	<0.01	<0.01	-
Trichlorofluoromethane	µg/g	0.1	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-	<0.10	<0.10	-
Vinyl chloride	µg/g	0.1	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-	<0.10	<0.10	-
Xylenes Total	µg/g	0.1	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-	<0.10	<0.10	-
Laboratory Identification Number			6081116-10	6081116-29		6081116-03	6081116-30		6081116-20	6081116-31		6081116-28	6081116-32	

NOTES:

-	Not analyzed or RPD not calculated.
<	Concentration is less than the laboratory detection limit indicated.
RDL	Laboratory Reportable Detection Limit
RPD	RPD is Relative Percentage Difference calculated as RPD=[C2-C1]/[(C1+C2)/2] where C1,C2 = concentrations of parameters in 1st and 2nd sample respectively.
	RPDs have only been considered where a concentration is greater than 5 times the RDL
BOLD	High RPDs are in bold (acceptable RPD is 45% for metals in soil [60% for high variability metals] 75% for PAHs in soil, and 60% for EPH and other organics in soil as recommended by BC Ministry of Environment Q&A, and BC Environmental Laboratory Manual).
	High variability metals include: Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, and Ti

Table 2: Soil Quality Assurance/Quality Control Analytical Results

Parameter	Unit	RDL	16TP30	DUP06	RPD (%)	16BGR01	DUP07	RPD (%)	16TP35-0.7m	DUP08	RPD (%)	16TP39-0.7m	DUP09	RPD (%)
			0.7 m			0 m			0.7 m			0.7 m		
			15-Aug-2016			15-Aug-2016			15-Aug-2016			15-Aug-2016		
Herbicides, Pesticides and Fungicides														
Alachlor	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Aldrin	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
a-BHC	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
a-Chlordane	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Atrazine	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Azinophos methyl	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
b-BHC	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Bromacil	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Bromoxynil	µg/g	0.02	-	-	-	<0.020	<0.020	-	-	-	-	-	-	-
Captan	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Chlorothalonil	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Chlorpyrifos	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Cyanazine	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
d-BHC	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Deltamethrin	µg/g	0.05	-	-	-	<0.050	<0.050	-	-	-	-	-	-	-
Diazinon	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Dichlorvos	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Diclofop-methyl	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Dieldrin	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Dimethoate	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Disulfoton	µg/g	0.02	-	-	-	<0.020	<0.020	-	-	-	-	-	-	-
Diuron	µg/g	0.02	-	-	-	<0.020	<0.020	-	-	-	-	-	-	-
Endosulfan I	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Endosulfan II	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Endosulfan sulphate	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Endrin	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Endrin aldehyde	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Endrin ketone	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
g-BHC (Lindane)	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
g-Chlordane	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Heptachlor	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Heptachlor epoxide	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Linuron	µg/g	0.02	-	-	-	<0.020	<0.020	-	-	-	-	-	-	-
Malathion	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Methoxychlor	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Methyl parathion	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Metolachlor	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Metribuzin	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
p,p-DDD	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
p,p-DDE	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
p,p-DDT	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Parathion	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Pentachloronitrobenzene	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Phorate	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Prometon	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Ronnel (Fenchlorphos)	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Simazine	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Sulfotepp	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Tebuthiuron	µg/g	0.02	-	-	-	<0.020	<0.020	-	-	-	-	-	-	-
Temephos (Abate)	µg/g	0.05	-	-	-	<0.050	<0.050	-	-	-	-	-	-	-
Terbufos	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Triallate	µg/g	0.005	-	-	-	<0.005	<0.005	-	-	-	-	-	-	-
Trifluralin	µg/g	0.01	-	-	-	<0.010	<0.010	-	-	-	-	-	-	-
Laboratory Identification Number			6081116-10	6081116-29		6081116-03	6081116-30		6081116-20	6081116-31		6081116-28	6081116-32	

NOTES:

-	Not analyzed or RPD not calculated.
<	Concentration is less than the laboratory detection limit indicated.
RDL	Laboratory Reportable Detection Limit
RPD	RPD is Relative Percentage Difference calculated as RPD=[C2-C1]/[(C1+C2)/2] where C1,C2 = concentrations of parameters in 1st and 2nd sample respectively.
	RPDs have only been considered where a concentration is greater than 5 times the RDL
BOLD	High RPDs are in bold (acceptable RPD is 45% for metals in soil [60% for high variability metals] 75% for PAHs in soil, and 60% for EPH and other organics in soil as recommended by BC Ministry of Environment Q&A, and BC Environmental Laboratory Manual).
	High variability metals include: Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, and Ti

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP02E1 SA#1	16TP02E1 SA#2	16TP02E2 SA#1	16TP02E2 SA#2	16TP02W1 SA#1		16TP02W1 SA#2
							0.15 m	0.4	0.15 m	0.4 m	0.15 m	0.15 m	0.4 m
							5/29/2017	5/29/2017	5/29/2017	5/29/2017	5/29/2017		5/29/2017
							16TP02E1 SA#1 D=0.15m	16TP02E1 SA#2 D=0.4m	16TP02E2 SA#1 D=0.15m	16TP02E2 SA#2 D=0.4m	16TP02W1 SA#1 D=0.15m	DUP #1	16TP02W1 SA#2 D=0.4m
Physical Parameters													
Moisture	%	-	-	-	-	-	6.6	15.2	13.7	12.7	3.1	3.8	16.2
Hydrocarbons				-	-	-							
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	<200	<200	<200	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)													
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	0.006	<0.005	<0.005	<0.005	0.013	0.014	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.018	<0.004	<0.004	<0.004	0.039	0.04	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	0.011	<0.01	<0.01	<0.01	0.033	0.036	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	0.019	<0.01	<0.01	<0.01	0.052	0.079	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.075	<0.01	<0.01	<0.01	0.131	0.146	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	0.059	<0.02	<0.02	<0.02	0.129	0.151	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	0.021	<0.01	<0.01	<0.01	0.053	0.063	<0.01
Chrysene	µg/g	-	-	-	-	-	0.031	<0.01	<0.01	<0.01	0.071	0.065	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	0.005	<0.005	<0.005	<0.005	0.012	0.015	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.026	<0.01	<0.01	<0.01	0.064	0.049	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	0.027	<0.02	<0.02	<0.02	0.062	0.083	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	0.026	<0.02	<0.02	<0.02	0.067	0.055	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	0.0412	<0.01	<0.01	<0.01	0.0986	0.135	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.1236	0.03	0.03	0.03	0.2958	0.405	0.03
IACR (CCME)	µg/g	1	1	-	-	-	0.905	<0.0625	<0.0625	<0.0625	**1.86**	**2.16**	<0.0625
Laboratory Identification Number							7052353_7052353-05	7052353_7052353-06	7052353_7052353-01	7052353_7052353-02	7052353_7052353-13	7052353_7052353-41	7052353_7052353-14

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP02W2 SA#1	16TP02W2 SA#2	16TP04E1 SA#1	16TP04E1 SA#2	16TP04E2 SA#1	16TP04E2 SA#2
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/29/2017	5/29/2017	5/29/2017	5/29/2017	5/29/2017	5/29/2017
							16TP02W2 SA#1 D=0.15m	16TP02W2 SA#2 D=0.4m	16TP04E1 SA#1 D=0.15m	16TP04E1 SA#2 D=0.4m	16TP04E2 SA#1 D=0.15m	16TP04E2 SA#2 D=0.4m
Physical Parameters												
Moisture	%	-	-	-	-	-	13	10.8	5.1	6.3	2.3	2.5
Hydrocarbons				-	-	-						
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	<200	<200	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)												
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Anthracene	µg/g	2.5	32	-	-	-	<0.004	<0.004	0.011	<0.004	<0.004	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	<0.01	<0.01	0.011	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.014	<0.01	0.032	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	<0.02	<0.02	0.021	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	<0.01	<0.01	0.011	<0.01	<0.01	<0.01
Chrysene	µg/g	-	-	-	-	-	<0.01	<0.01	0.018	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.01	<0.01	0.015	<0.01	<0.01	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	<0.01	<0.01	0.0167	<0.01	<0.01	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.03	0.03	0.0501	0.03	0.03	0.03
IACR (CCME)	µg/g	1	1	-	-	-	0.0905	<0.0625	0.384	<0.0625	<0.0625	<0.0625
Laboratory Identification Number							7052353_7052353-09	7052353_7052353-10	7052353_7052353-21	7052353_7052353-22	7052353_7052353-17	7052353_7052353-18

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP04W1 SA#1	16TP04W1 SA#2	16TP04W2 SA#1	16TP04W2 SA#2	16TP14E1SA#1	16TP14E1SA#2
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/29/2017	5/29/2017	5/29/2017	5/29/2017	5/30/2017	5/30/2017
							16TP04W1 SA#1 D=0.15m	16TP04W1 SA#2 D=0.4m	16TP04W2 SA#1 D=0.15m	16TP04W2 SA#2 D=0.4m	16TP14E1SA#1 D=0.15m	16TP14E1SA#2 D=0.4m
Physical Parameters												
Moisture	%	-	-	-	-	-	4.1	4.4	9.3	4	3	13.2
Hydrocarbons				-	-	-						
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	<200	<200	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)												
2-methylnaphthalene	µg/g	-	-	-	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	0.009	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	<0.005	<0.005	<0.005	<0.005	0.034	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.017	<0.004	<0.004	<0.004	0.101	0.005
Benz(a)anthracene	µg/g	1	10	1	1	10	0.012	<0.01	<0.01	<0.01	0.051	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	0.022	<0.01	<0.01	<0.01	0.124	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.056	<0.01	<0.01	<0.01	0.295	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	0.046	<0.02	<0.02	<0.02	0.668	0.027
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	0.02	<0.01	<0.01	<0.01	0.127	<0.01
Chrysene	µg/g	-	-	-	-	-	0.029	<0.01	<0.01	<0.01	0.142	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	<0.005	<0.005	<0.005	<0.005	0.04	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.024	<0.01	<0.01	<0.01	0.209	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	0.026	<0.02	<0.02	<0.02	0.265	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	<0.02	<0.02	<0.02	<0.02	0.046	<0.02
Pyrene	µg/g	10	100	10	10	100	0.021	<0.02	<0.02	<0.02	0.187	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	0.0366	<0.01	<0.01	<0.01	0.246	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.1098	0.03	0.03	0.03	0.738	0.03
IACR (CCME)	µg/g	1	1	-	-	-	0.742	<0.0625	<0.0625	<0.0625	**3.56**	<0.0625
Laboratory Identification Number							7052353_7052353-29	7052353_7052353-30	7052353_7052353-25	7052353_7052353-26	7052560_7052560-13	7052560_7052560-14

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP14E2SA#1	16TP14E2SA#2	16TP14W1SA#1		16TP14W1SA#2	16TP14W2SA#1	16TP14W2SA#2
							0.15 m	0.4 m	0.15 m		0.4 m	0.15 m	0.4 m
							5/30/2017	5/30/2017	5/30/2017		5/30/2017	5/30/2017	5/30/2017
							16TP14E2SA#1 D=0.15m	16TP14E2SA#2 D=0.4m	16TP14W1SA#1 D=0.15m	DUP #3	16TP14W1SA#2 D=0.4m	16TP14W2SA#1 D=0.15m	16TP14W2SA#2 D=0.4m
Physical Parameters													
Moisture	%	-	-	-	-	-	8.1	9	3	1.5	7.3	10.1	2.7
Hydrocarbons				-	-	-							
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	<200	<200	<200	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)													
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	<0.005	<0.005	0.027	0.028	0.012	<0.005	<0.005
Anthracene	µg/g	2.5	32	-	-	-	<0.004	<0.004	0.079	0.072	0.044	<0.004	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	<0.01	<0.01	0.024	0.026	0.012	<0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	<0.01	<0.01	0.069	0.087	0.036	<0.01	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	<0.01	<0.01	0.214	0.237	0.109	0.019	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	<0.02	<0.02	0.504	0.427	0.189	<0.02	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	<0.01	<0.01	0.086	0.094	0.041	<0.01	<0.01
Chrysene	µg/g	-	-	-	-	-	<0.01	<0.01	0.084	0.077	0.042	0.01	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	<0.005	<0.005	0.028	0.026	0.013	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	<0.01	<0.01	0.105	0.084	0.041	<0.01	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	<0.02	<0.02	0.186	0.171	0.086	<0.02	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	<0.02	<0.02	0.027	0.02	<0.02	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	<0.02	<0.02	0.099	0.085	0.04	<0.02	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	<0.01	<0.01	0.154	0.181	0.0761	<0.01	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.03	0.03	0.462	0.543	0.2283	0.03	0.03
IACR (CCME)	µg/g	1	1	-	-	-	<0.0625	<0.0625	**2.44**	**3.26**	**1.21**	0.121	<0.0625
Laboratory Identification Number							7052560_7052560-21	7052560_7052560-22	7052560_7052560-17	7052560_7052560-73	7052560_7052560-18	7052560_7052560-01	7052560_7052560-02

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP14N1 SA#1	16TP14N1 SA#2		16TP14S1 SA#1	16TP14S1 SA#2	16TP16E1SA#1	16TP16E1SA#2
							0.15 m	0.4 m		0.15 m	0.4 m	0.15	0.4 m
							5/29/2017	5/29/2017	5/29/2017	5/29/2017	5/29/2017	5/30/2017	5/30/2017
							16TP14N1 SA#1 D=0.15m	16TP14N1 SA#2 D=0.4m	DUP #2	16TP14S1 SA#1 D=0.15m	16TP14S1 SA#2 D=0.4m	16TP16E1SA#1 D=0.15m	16TP16E1SA#2 D=0.4m
Physical Parameters													
Moisture	%	-	-	-	-	-	2.8	10.1	6	3.3	5.4	2.8	8
Hydrocarbons				-	-	-							
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	398	<200	<200	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	396	<200	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)													
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	0.056	<0.005	<0.005	0.121	<0.005	<0.005	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.154	<0.004	<0.004	0.273	0.009	0.019	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	0.071	<0.01	<0.01	0.117	<0.01	0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	0.278	<0.01	<0.01	0.278	<0.01	0.021	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.36	<0.01	<0.01	0.427	<0.01	0.059	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	1.9	<0.02	<0.02	1.78	<0.02	0.047	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	0.167	<0.01	<0.01	0.186	<0.01	0.021	<0.01
Chrysene	µg/g	-	-	-	-	-	0.116	<0.01	<0.01	0.164	<0.01	0.033	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	0.074	<0.005	<0.005	0.092	<0.005	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.084	<0.01	<0.01	0.255	<0.01	0.027	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	0.539	<0.02	<0.02	0.556	<0.02	0.026	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	<0.02	<0.02	<0.02	0.043	<0.02	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	0.101	<0.02	<0.02	0.304	<0.02	0.026	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	0.501	<0.01	<0.01	0.536	<0.01	0.0354	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				1.503	0.03	0.03	1.608	0.03	0.1062	0.03
IACR (CCME)	µg/g	1	1	-	-	-	**6.08**	<0.0625	<0.0625	**6.97**	<0.0625	0.77	<0.0625
Laboratory Identification Number							7052353_7052353-33	7052353_7052353-34	7052353_7052353-42	7052353_7052353-37	7052353_7052353-38	7052560_7052560-09	7052560_7052560-10

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP16E2SA#1	16TP16E2SA#2	16TP16N1SA#1	16TP16N1SA#2	16TP16S1SA#1	16TP16S1SA#2	16TP16W1SA#1
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m	0.15 m
							5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017
							16TP16E2SA#1 D=0.15m	16TP16E2SA#2 D=0.4m	16TP16N1SA#1 D=0.15m	16TP16N1SA#2 D=0.4m	16TP16S1SA#1 D=0.15m	16TP16S1SA#2 D=0.4m	16TP16W1SA#1 D=0.15m
Physical Parameters													
Moisture	%	-	-	-	-	-	3	2.6	2.8	1.9	2.5	5.7	1.6
Hydrocarbons				-	-	-							
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	629	639	249	<200	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	629	639	245	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)													
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	0.013	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	<0.005	<0.005	<0.005	<0.005	0.148	0.009	<0.005
Anthracene	µg/g	2.5	32	-	-	-	<0.004	<0.004	0.013	<0.004	0.474	0.035	0.017
Benz(a)anthracene	µg/g	1	10	1	1	10	<0.01	<0.01	<0.01	<0.01	0.129	<0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	<0.01	<0.01	<0.01	<0.01	0.389	0.013	0.015
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.021	<0.01	0.015	<0.01	0.726	0.022	0.044
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	<0.02	<0.02	0.027	<0.02	5.45	0.077	0.047
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	<0.01	<0.01	<0.01	<0.01	0.298	<0.01	0.015
Chrysene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	0.245	<0.01	0.018
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	<0.005	<0.005	<0.005	<0.005	0.177	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	<0.01	<0.01	<0.01	<0.01	0.308	<0.01	0.02
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	<0.02	<0.02	<0.02	<0.02	0.919	0.021	0.026
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	**0.021**	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	<0.02	<0.02	<0.02	<0.02	**0.064**	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	<0.02	<0.02	<0.02	<0.02	0.365	<0.02	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	<0.01	<0.01	<0.01	<0.01	0.83	0.0176	0.0265
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.03	0.03	0.03	0.03	2.49	0.0528	0.0795
IACR (CCME)	µg/g	1	1	-	-	-	0.132	<0.0625	0.0949	<0.0625	**9.87**	0.19	0.557
Laboratory Identification Number							7052560_7052560-05	7052560_7052560-06	7052560_7052560-33	7052560_7052560-34	7052560_7052560-37	7052560_7052560-38	7052560_7052560-29

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP16W1SA#2	16TP16W2SA#1	16TP16W2SA#2	16TP17E1SA#1	16TP17E2SA#1	16TP17W1SA#1	16TP17W2SA#1
							0.4 m	0.15 m	0.4 m	0.15 m	0.15 m	0.15 m	0.15 m
							5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017
							16TP16W1SA#2 D=0.4m	16TP16W2SA#1 D=0.15m	16TP16W2SA#2 D=0.4m	16TP17E1SA#1 D=0.15m	16TP17E2SA#1 D=0.15m	16TP17W1SA#1 D=0.15m	16TP17W2SA#1 D=0.15m
Physical Parameters													
Moisture	%	-	-	-	-	-	6.7	4.6	9.3	1.6	3.9	1.8	4.2
Hydrocarbons				-	-	-							
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	-	-	-	-
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	-	-	-	-
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	-	-	-	-
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	-	-	-	-
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	-	-	-	-
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)													
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.005	<0.004	<0.004	0.028	0.006	0.01	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	<0.01	<0.01	<0.01	0.013	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	<0.01	<0.01	<0.01	0.033	0.012	<0.01	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.017	<0.01	<0.01	0.091	0.028	0.033	0.011
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	<0.02	<0.02	<0.02	0.09	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	<0.01	<0.01	<0.01	0.032	<0.01	<0.01	<0.01
Chrysene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	0.035	0.014	0.014	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	<0.005	<0.005	<0.005	0.008	<0.005	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	<0.01	<0.01	<0.01	0.032	0.016	0.013	0.022
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	<0.02	<0.02	<0.02	0.044	<0.02	<0.02	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	<0.02	<0.02	<0.02	0.032	<0.02	<0.02	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	<0.01	<0.01	<0.01	0.0603	0.0241	0.0226	0.0204
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.03	0.03	0.03	0.181	0.072	0.068	0.061
IACR (CCME)	µg/g	1	1	-	-	-	0.109	<0.0625	<0.0625	0.9783	0.2890	0.3648	<0.0625
Laboratory Identification Number							7052560_7052560-30	7052560_7052560-25	7052560_7052560-26	7052560_7052560-53	7052560_7052560-49	7052560_7052560-45	7052560_7052560-41

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP22E1SA#1	16TP22E2SA#1	16TP22W1SA#1		16TP22W2SA#1	16TP28E1 SA#1	16TP28E1 SA#2
							0.15 m	0.15 m	0.15 m		0.15 m	0.15 m	0.4 m
							5/30/2017	5/30/2017	5/30/2017		5/30/2017	5/31/2017	5/31/2017
							16TP22E1SA#1 D=0.15m	16TP22E2SA#1 D=0.15m	16TP22W1SA#1 D=0.15m	DUP #4	16TP22W2SA#1 D=0.15m	16TP28E1 SA#1 D=0.15m	16TP28E1 SA#2 D=0.4m
Physical Parameters													
Moisture	%	-	-	-	-	-	0.8	2.6	1.4	2.2	5.9	1.8	4.1
Hydrocarbons				-	-	-							
F2 (C10-C16)	µg/g	150	260	-	-	-	-	-	-	-	-	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	-	-	-	-	-	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	-	-	-	-	-	<200	<200
F3-PAH	µg/g	-	-	-	-	-	-	-	-	-	-	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	-	-	-	-	-	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	-	-	-	-	-	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)													
2-methylnaphthalene	µg/g	-	-	-	-	-	0.012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	0.032	<0.005	0.021	0.024	<0.005	<0.005	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.098	<0.004	0.075	0.085	<0.004	<0.004	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	0.056	<0.01	0.072	0.08	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	0.128	<0.01	0.094	0.101	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.302	<0.01	0.22	0.215	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	0.452	<0.02	0.263	0.295	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	0.13	<0.01	0.094	0.092	<0.01	<0.01	<0.01
Chrysene	µg/g	-	-	-	-	-	0.142	<0.01	0.129	0.123	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	0.032	<0.005	0.02	0.019	<0.005	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.168	<0.01	0.14	0.101	<0.01	<0.01	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	0.208	<0.02	0.118	0.117	<0.02	<0.02	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	0.04	<0.02	0.026	0.022	<0.02	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	0.166	<0.02	0.149	0.149	<0.02	<0.02	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	0.2355	<0.01	0.1683	0.1746	<0.01	<0.01	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.707	0.03	0.505	0.524	0.03	0.03	0.03
IACR (CCME)	µg/g	1	1	-	-	-	**3.57**	<0.0625	**2.67**	**2.66**	<0.0625	<0.0625	<0.0625
Laboratory Identification Number							7052560_7052560-61	7052560_7052560-57	7052560_7052560-69	7052560_7052560-74	7052560_7052560-65	7060116_7060116-17	7060116_7060116-18

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP28E2 SA#1	16TP28E2 SA#2	16TP28N1 SA#1	16TP28N1 SA#2	16TP28S1 SA#1	16TP28S1 SA#2
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP28E2 SA#1 D=0.15m	16TP28E2 SA#2 D=0.4m	16TP28N1 SA#1 D=0.15m	16TP28N1 SA#2 D=0.4m	16TP28S1 SA#1 D=0.15m	16TP28S1 SA#2 D=0.4m
Physical Parameters												
Moisture	%	-	-	-	-	-	3.2	4.9	2.5	5	3.7	5.4
Hydrocarbons				-	-	-						
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	<200	<200	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)												
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Anthracene	µg/g	2.5	32	-	-	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.03	0.03	0.03	0.03	0.03	0.03
IACR (CCME)	µg/g	1	1	-	-	-	<0.0625	<0.0625	<0.0625	<0.0625	<0.0625	<0.0625
Laboratory Identification Number							7060116_7060116-13	7060116_7060116-14	7060116_7060116-01	7060116_7060116-02	7060116_7060116-05	7060116_7060116-06

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use. Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP28W1 SA#1	16TP28W1 SA#2	16TP30E1 SA#1	16TP30E1 SA#2	16TP30E2 SA#1	16TP30E2 SA#2
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP28W1 SA#1 D=0.15m	16TP28W1 SA#2 D=0.4m	16TP30E1 SA#1 D=0.15m	16TP30E1 SA#2 D=0.4m	16TP30E2 SA#1 D=0.15m	16TP30E2 SA#2 D=0.4m
Physical Parameters												
Moisture	%	-	-	-	-	-	3.8	2.2	5.1	8.5	28.7	14.6
Hydrocarbons				-	-	-						
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	<200	<200	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)												
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	0.019	<0.005	<0.005	<0.005	<0.005	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.079	<0.004	<0.004	<0.004	<0.004	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	0.045	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	0.092	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.177	<0.01	<0.01	<0.01	0.011	0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	0.59	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	0.076	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/g	-	-	-	-	-	0.078	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	0.026	<0.005	<0.005	<0.005	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.064	<0.01	<0.01	<0.01	0.01	0.011
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	0.124	<0.02	<0.02	<0.02	<0.02	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	0.071	<0.02	<0.02	<0.02	<0.02	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	0.166	<0.01	<0.01	<0.01	<0.01	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.498	0.03	0.03	0.03	0.03	0.03
IACR (CCME)	µg/g	1	1	-	-	-	**2.25**	<0.0625	<0.0625	<0.0625	0.0711	0.063
Laboratory Identification Number							7060116_7060116-09	7060116_7060116-10	7060116_7060116-37	7060116_7060116-38	7060116_7060116-33	7060116_7060116-34

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life.
	Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP30S1 SA#1	16TP30S1 SA#2		16TP30W1 SA#1	16TP30W1 SA#2	16TP30W2 SA#1	16TP30W2 SA#2
							0.15 m	0.4 m		0.15 m	0.4 m	0.15 m	0.4 m
							5/31/2017	5/31/2017		5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP30S1 SA#1 D=0.15m	16TP30S1 SA#2 D=0.4m	Dupe #5	16TP30W1 SA#1 D=0.15m	16TP30W1 SA#2 D=0.4m	16TP30W2 SA#1 D=0.15m	16TP30W2 SA#2 D=0.4m
Physical Parameters													
Moisture	%	-	-	-	-	-	7.1	4.1	5.6	5.1	4.5	16.6	20.6
Hydrocarbons				-	-	-							
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	<200	<200	<200	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)													
2-methylnaphthalene	µg/g	-	-	-	-	-	0.022	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	0.006	<0.005	0.007	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	0.476	<0.005	<0.005	0.021	<0.005	<0.005	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.864	0.005	0.004	0.057	0.027	0.009	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	0.244	<0.01	<0.01	0.023	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	0.53	<0.01	<0.01	0.037	0.015	0.012	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.59	<0.01	<0.01	0.098	0.031	0.029	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	1.02	0.038	<0.02	0.132	0.059	<0.02	<0.021
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	0.257	<0.01	<0.01	0.039	0.013	<0.01	<0.01
Chrysene	µg/g	-	-	-	-	-	0.233	<0.01	<0.01	0.052	0.018	0.017	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	0.132	0.028	<0.005	0.01	<0.005	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.344	<0.01	<0.01	0.062	0.022	0.023	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	0.026	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	0.586	0.028	<0.02	0.056	0.024	<0.02	<0.021
Naphthalene	µg/g	0.013	0.013	5	5	50	**0.057**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	**0.088**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.021
Pyrene	µg/g	10	100	10	10	100	0.359	<0.02	<0.02	0.054	0.024	0.02	<0.021
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	0.871	0.0314	<0.01	0.0749	0.0242	0.0157	<0.0105
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				2.613	0.0942	0.03	0.2247	0.0726	0.0471	0.03
IACR (CCME)	µg/g	1	1	-	-	-	**10.3**	0.139	<0.0625	**1.38**	0.425	0.283	<0.0656
Laboratory Identification Number							7060116_7060116-21	7060116_7060116-22	7060116_7060116-AJ	7060116_7060116-29	7060116_7060116-30	7060116_7060116-25	7060116_7060116-26

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP34E1 SA#1	16TP34E1 SA#2	16TP34E2 SA#1	16TP34E2 SA#2	16TP34N1 SA#1	16TP34N1 SA#2
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP34E1 SA#1 D=0.15m	16TP34E1 SA#2 D=0.4m	16TP34E2 SA#1 D=0.15m	16TP34E2 SA#2 D=0.4m	16TP34N1 SA#1 D=0.15m	16TP34N1 SA#2 D=0.4m
Physical Parameters												
Moisture	%	-	-	-	-	-	7.1	8.6	5.1	4.6	3	5.1
Hydrocarbons				-	-	-						
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	-	<100	-	<100	-
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	-	<100	-	<100	-
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	-	<200	-	<200	-
F3-PAH	µg/g	-	-	-	-	-	<200	-	<200	-	<200	-
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	-	<200	-	<200	-
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	-	YES	-	YES	-
Polycyclic Aromatic Hydrocarbons (PAHs)												
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	0.03	<0.005	<0.005	<0.005	0.026	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.149	<0.004	<0.004	<0.004	0.115	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	0.599	<0.01	<0.01	<0.01	0.039	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	0.505	<0.01	<0.01	<0.01	0.093	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.87	<0.01	<0.01	<0.01	0.233	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	0.431	<0.02	<0.02	<0.02	0.362	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	0.4	<0.01	<0.01	<0.01	0.093	<0.01
Chrysene	µg/g	-	-	-	-	-	0.739	<0.01	<0.01	<0.01	0.098	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	0.105	<0.005	0.006	<0.005	0.033	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.8	<0.01	<0.01	<0.01	0.118	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	0.361	<0.02	<0.02	<0.02	0.177	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	0.041	<0.02	<0.02	<0.02	0.028	<0.02
Pyrene	µg/g	10	100	10	10	100	1.1	<0.02	<0.02	<0.02	0.115	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	0.881	<0.01	<0.01	<0.01	0.194	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				2.643	0.03	0.03	0.03	0.582	0.03
IACR (CCME)	µg/g	1	1	-	-	-	**14.3**	<0.0656	<0.0656	<0.0656	**3.29**	<0.0656
Laboratory Identification Number							7060116_7060116-53	7060116_7060116-54	7060116_7060116-49	7060116_7060116-50	7060116_7060116-41	7060116_7060116-42

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP34S1 SA#1	16TP34S1 SA#2	16TP34W1 SA#1	16TP34W1 SA#2	16TP34W2 SA#1	16TP34W2 SA#2
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP34S1 SA#1 D=0.15m	16TP34S1 SA#2 D=0.4m	16TP34W1 SA#1 D=0.15m	16TP34W1 SA#2 D=0.4m	16TP34W2 SA#1 D=0.15m	16TP34W2 SA#2 D=0.4m
Physical Parameters												
Moisture	%	-	-	-	-	-	2.9	3.6	3.9	3.8	10	5.9
Hydrocarbons				-	-	-						
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	-	<100	-	<100	-
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	-	<100	-	<100	-
F3 (C16-C34)	µg/g	300	1700	-	-	-	205	-	<200	-	<200	-
F3-PAH	µg/g	-	-	-	-	-	<200	-	<200	-	<200	-
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	-	<200	-	<200	-
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	-	YES	-	YES	-
Polycyclic Aromatic Hydrocarbons (PAHs)												
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	0.119	<0.005	<0.005	<0.005	<0.005	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.365	0.005	<0.004	<0.004	<0.004	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	0.239	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	0.573	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	**1.25**	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	3.09	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	0.496	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/g	-	-	-	-	-	0.583	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	0.149	<0.005	<0.005	<0.005	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.69	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	0.897	<0.02	<0.02	<0.02	<0.02	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	**0.086**	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	0.772	<0.02	<0.02	<0.02	<0.02	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	1.09	<0.01	<0.01	<0.01	<0.01	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				3.27	0.03	0.03	0.03	0.03	0.03
IACR (CCME)	µg/g	1	1	-	-	-	**17.9**	<0.0656	<0.0625	<0.0656	<0.0625	<0.0656
Laboratory Identification Number							7060116_7060116-45	7060116_7060116-46	7060116_7060116-61	7060116_7060116-62	7060116_7060116-57	7060116_7060116-58

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP37E1 SA#1	16TP37E1 SA#2	16TP37E2 SA#1	16TP37E2 SA#2	16TP37N1 SA#1	16TP37N1 SA#2	
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m	
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	
							16TP37E1 SA#1 D=0.15m	16TP37E1 SA#2 D=0.4m	16TP37E2 SA#1 D=0.15m	16TP37E2 SA#2 D=0.4m	16TP37N1 SA#1 D=0.15m	16TP37N1 SA#2 D=0.4m	Dupe #6
Physical Parameters													
Moisture	%	-	-	-	-	-	3.3	7.2	5.7	8.1	2.5	2.9	3.1
Hydrocarbons				-	-	-							
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	<200	<200	<200	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)													
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	0.007	<0.005	<0.005	<0.005	0.006	<0.005	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.032	0.011	<0.004	<0.004	0.028	<0.004	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	0.016	<0.01	<0.01	<0.01	0.011	<0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	0.033	0.01	<0.01	<0.01	0.022	<0.01	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.12	0.022	<0.01	<0.01	0.051	<0.01	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	0.124	0.033	<0.02	<0.02	0.165	<0.02	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	0.047	<0.01	<0.01	<0.01	0.022	<0.01	<0.01
Chrysene	µg/g	-	-	-	-	-	0.052	0.013	<0.01	<0.01	0.026	<0.01	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	0.011	<0.005	<0.005	<0.005	0.009	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.051	0.014	<0.01	<0.01	0.032	<0.01	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	0.066	<0.02	<0.02	<0.02	0.05	<0.02	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	0.047	<0.02	<0.02	<0.02	0.035	<0.02	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	0.0754	0.0131	<0.01	<0.01	0.0485	<0.01	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.2262	0.0393	0.03	0.03	0.1455	0.03	0.03
IACR (CCME)	µg/g	1	1	-	-	-	**1.59**	0.179	<0.0625	<0.0625	0.777	<0.0625	<0.0625
Laboratory Identification Number							7060116_7060116-85	7060116_7060116-86	7060116_7060116-81	7060116_7060116-82	7060116_7060116-65	7060116_7060116-66	7060116_7060116-AK

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP37S1 SA#1	16TP37S1 SA#2	16TP37W1 SA#1	16TP37W1 SA#2	16TP37W2 SA#1	16TP37W2 SA#2
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP37S1 SA#1 D=0.15m	16TP37S1 SA#2 D=0.4m	16TP37W1 SA#1 D=0.15m	16TP37W1 SA#2 D=0.4m	16TP37W2 SA#1 D=0.15m	16TP37W2 SA#2 D=0.4m
Physical Parameters												
Moisture	%	-	-	-	-	-	4	3.3	4.5	6.5	7	6.1
Hydrocarbons				-	-	-						
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	<200	<200	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	<200	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)												
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	0.131	0.007	0.019	0.011	<0.005	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.5	0.03	0.071	0.049	<0.004	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	0.084	<0.01	0.037	0.028	<0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	0.15	<0.01	0.078	0.056	<0.01	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.273	<0.01	0.212	0.192	<0.01	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	1.48	0.029	0.282	0.23	<0.02	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	0.105	<0.01	0.09	0.075	<0.01	<0.01
Chrysene	µg/g	-	-	-	-	-	0.126	<0.01	0.106	0.077	<0.01	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	0.041	<0.005	0.023	0.021	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.225	<0.01	0.139	0.062	<0.01	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	0.263	<0.02	0.126	0.115	<0.02	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	0.013	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	0.043	<0.02	0.035	0.021	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	0.276	<0.02	0.123	0.063	<0.02	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	0.291	<0.01	0.161	0.128	<0.01	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.873	0.03	0.483	0.384	0.03	0.03
IACR (CCME)	µg/g	1	1	-	-	-	**4.23**	<0.0625	**3**	**2.56**	<0.0625	<0.0625
Laboratory Identification Number							7060116_7060116-69	7060116_7060116-70	7060116_7060116-77	7060116_7060116-78	7060116_7060116-73	7060116_7060116-74

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP39E1 SA#1	16TP39E1 SA#2	16TP39E2 SA#1	16TP39E2 SA#2	16TP39N1 SA#1	16TP39N1 SA#2
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP39E1 SA#1 D=0.15m	16TP39E1 SA#2 D=0.4m	16TP39E2 SA#1 D=0.15m	16TP39E2 SA#2 D=0.4m	16TP39N1 SA#1 D=0.15m	16TP39N1 SA#2 D=0.4m
Physical Parameters												
Moisture	%	-	-	-	-	-	13.6	9.2	8.8	3.8	4.4	3.5
Hydrocarbons				-	-	-						
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	<200	988	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	<200	987	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)												
2-methylnaphthalene	µg/g	-	-	-	-	-	0.53	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	0.007	<0.005	<0.005	<0.005	0.03	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.039	<0.004	0.005	<0.004	0.138	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	0.023	<0.01	<0.01	<0.01	0.059	<0.01
Benzo(a)pyrene	µg/g	20	72	1 #1	1 #1	10 #1	0.053	<0.01	<0.01	<0.01	0.11	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.126	<0.01	0.015	<0.01	0.279	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	0.088	<0.02	<0.02	<0.02	0.718	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	0.045	<0.01	<0.01	<0.01	0.1	<0.01
Chrysene	µg/g	-	-	-	-	-	0.077	<0.01	<0.01	<0.01	0.12	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	0.012	<0.005	<0.005	<0.005	0.034	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.06	<0.01	<0.01	<0.01	0.165	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	0.018	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	0.051	<0.02	<0.02	<0.02	0.234	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	**0.271**	<0.01	<0.01	<0.01	**0.019**	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	**0.244**	<0.02	<0.02	<0.02	**0.065**	<0.02
Pyrene	µg/g	10	100	10	10	100	0.075	<0.02	<0.02	<0.02	0.17	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	0.0953	<0.01	<0.01	<0.01	0.229	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.2859	0.03	0.03	0.03	0.687	0.03
IACR (CCME)	µg/g	1	1	-	-	-	**1.67**	<0.0625	0.0955	<0.0625	**3.86**	<0.0625
Laboratory Identification Number							7060116_7060116-AF	7060116_7060116-AG	7060116_7060116-AB	7060116_7060116-AC	7060116_7060116-89	7060116_7060116-90

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 1: Soil Analytical Results - Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP39W1 SA#1	16TP39W1 SA#2	16TP39W2 SA#1	16TP39W2 SA#2
							0.15 m	0.4 m	0.15 m	0.4 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP39W1 SA#1 D=0.15m	16TP39W1 SA#2 D=0.4m	16TP39W2 SA#1 D=0.15m	16TP39W2 SA#2 D=0.4m
Physical Parameters										
Moisture	%	-	-	-	-	-	6.2	7	11.4	7.4
Hydrocarbons				-	-	-				
F2 (C10-C16)	µg/g	150	260	-	-	-	<100	<100	<100	<100
F2-NAPHTHALENE	µg/g	-	-	-	-	-	<100	<100	<100	<100
F3 (C16-C34)	µg/g	300	1700	-	-	-	<200	<200	<200	<200
F3-PAH	µg/g	-	-	-	-	-	<200	<200	<200	<200
F4 (C34-C50)	µg/g	2800	3300	-	-	-	<200	<200	<200	<200
Reached Baseline at C_{50}	N/A	-	-	-	-	-	YES	YES	YES	YES
Polycyclic Aromatic Hydrocarbons (PAHs)										
2-methylnaphthalene	µg/g	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/g	0.28	0.28	-	-	-	<0.005	<0.005	<0.005	<0.005
Acenaphthylene	µg/g	320	320	-	-	-	0.018	<0.005	<0.005	<0.005
Anthracene	µg/g	2.5	32	-	-	-	0.067	0.02	<0.004	<0.004
Benz(a)anthracene	µg/g	1	10	1	1	10	0.029	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/g	20	72	1 [#1]	1 [#1]	10 [#1]	0.07	0.022	<0.01	<0.01
Benzo(b)fluoranthene	µg/g	1	10	1	1	10	0.179	0.052	<0.01	<0.01
Benzo(g,h,i)perylene	µg/g	-	-	-	-	-	0.299	0.072	<0.02	<0.02
Benzo(k)fluoranthene	µg/g	1	10	1	1	10	0.07	0.019	<0.01	<0.01
Chrysene	µg/g	-	-	-	-	-	0.076	0.022	<0.01	<0.01
Dibenz(a,h)anthracene	µg/g	1	10	1	1	10	0.02	0.005	<0.005	<0.005
Fluoranthene	µg/g	50	180	-	-	-	0.086	0.026	0.014	<0.01
Fluorene	µg/g	0.25	0.25	-	-	-	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/g	1	10	1	1	10	0.126	0.033	<0.02	<0.02
Naphthalene	µg/g	0.013	0.013	5	5	50	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/g	0.046	0.046	5	5	50	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/g	10	100	10	10	100	0.084	0.024	<0.02	<0.02
B(a)P Total Potency Equivalent	µg/g	5.3	5.3	-	-	-	0.142	0.0405	<0.01	<0.01
B[a]P TPE multiplied by 3*	µg/g	5.3	5.3				0.426	0.1215	0.03	0.03
IACR (CCME)	µg/g	1	1	-	-	-	**2.5**	0.689	<0.0625	<0.0625
Laboratory Identification Number							7060116_7060116-97	7060116_7060116-98	7060116_7060116-93	7060116_7060116-94

NOTES:

#1	CSR Schedule 5 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
*	As the site has the potential of soil contaminated by creosote the calculated B(a)P TPE was multiplied by a safety factor of three as per CCME guidance (2010).
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use.
	Canadian Council of Ministers of the Environment (CCME) (2008). Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil, for coarse soils under Residential/Parkland and Commercial land use.
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
B[a]P TPE	Benzo[a]Pyrene (B[a]P) Total Potency Equivalent (TPE) relative to benzo(a)pyrene which is determined by adding the products of the measured concentrations of each listed PAH in the CCME PAH 2010 guideline multiplied by the TPE listed.
B[a]P TPE =	(benzo(a)anthracene)(0.1)+(benzo(a)pyrene)(1.0)+(benzo(b)fluoranthene)(0.1)+(benzo(k)fluoranthene)(0.1)+(Benzo(g)perylene)(0.01)+(chrysene)(0.01)+(dibenz(a,h)anthracene)(1)+(indeno(1,2,3-cd)pyrene)(0.1).
IACR	Calculated risk of Index of additive Cancer Risk (IACR) which is determined by adding the measured concentrations of each listed PAH in the CCME PAH 2010 guideline divided by the soil quality guideline listed.
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil. - Toxicity to soil invertebrates and plants. - Groundwater used for drinking water. - Groundwater flow to surface water used by freshwater aquatic life. Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP02E1 SA#1	16TP02E1 SA#2	16TP02E2 SA#1	16TP02E2 SA#2	16TP02W1 SA#1		16TP02W1 SA#2
							0.15 m	0.4	0.15 m	0.4 m	0.15 m	0.15 m	0.4 m
							5/29/2017	5/29/2017	5/29/2017	5/29/2017	5/29/2017		5/29/2017
							16TP02E1 SA#1 D=0.15m	16TP02E1 SA#2 D=0.4m	16TP02E2 SA#1 D=0.15m	16TP02E2 SA#2 D=0.4m	16TP02W1 SA#1 D=0.15m	DUP #1	16TP02W1 SA#2 D=0.4m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	7.7	7.4	7.4	7.7	8	7.9	7.4
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	0.38	0.14	0.13	<0.1	0.66	0.63	<0.1
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	2.92	1.66	1.79	1.44	3.97	4.08	1.55
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	98.4	115	114	92.5	102	94.1	125
Beryllium	µg/g	4	8	4	4	8	0.42	0.66	0.58	0.58	0.37	0.34	0.64
Boron_	µg/g	-	-	-	-	-	<2	2.1	2.8	<2	2.3	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.3	0.135	0.171	0.105	0.424	0.408	0.146
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	35.1	33.1	32.8	32.1	41	36.5	34.9
Cobalt	µg/g	50	300	50	50	300	11.4	14.2	14	13.6	12.4	11.6	14.6
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	**84.5**	19.4	21.1	15.1	**96.8**	**86.5**	19.2
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	11.3	4.26	5.7	3.73	15.8	14.1	4.27
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	11.7	10.7	9.76	10.3	14.3	13.3	10.5
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	511	749	728	677	521	483	789
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	1.21	0.99	0.92	0.73	1.49	1.46	1.01
Nickel	µg/g	45	89	100	100	500	27.6	24.9	24.3	24.7	32.6	30.8	25.1
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	40.3	58.8	63.3	47.9	39.6	40.5	65.6
Thallium	µg/g	1	1	-	-	-	0.14	0.11	0.1	0.11	0.16	0.14	0.11
Tin	µg/g	50	300	50	50	300	1	0.72	0.77	0.66	1.45	1.31	0.72
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.779	1.21	0.961	0.95	0.828	0.673	1.05
Vanadium	µg/g	130	130	200	200	-	50.9	56.3	55.7	55.5	57.5	51.8	57.9
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	78.3	83.7	82.0	63.3	75.6	75.6	92.3
Laboratory Identification Number							7052353_7052353-05	7052353_7052353-06	7052353_7052353-01	7052353_7052353-02	7052353_7052353-13	7052353_7052353-41	7052353_7052353-14

NOTES:

#1	CSR Schedule 5 Substance.
#2	Standard is pH dependent. Values shown based on median pH of 7.9
#3	CSR Schedule 10 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil.
	- Toxicity to soil invertebrates and plants.
	- Groundwater used for drinking water.
	- Groundwater flow to surface water used by freshwater aquatic life.
	Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP02W2 SA#1	16TP02W2 SA#2	16TP04E1 SA#1	16TP04E1 SA#2	16TP04E2 SA#1	16TP04E2 SA#2	16TP04W1 SA#1
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m	0.15 m
							5/29/2017	5/29/2017	5/29/2017	5/29/2017	5/29/2017	5/29/2017	5/29/2017
							16TP02W2 SA#1 D=0.15m	16TP02W2 SA#2 D=0.4m	16TP04E1 SA#1 D=0.15m	16TP04E1 SA#2 D=0.4m	16TP04E2 SA#1 D=0.15m	16TP04E2 SA#2 D=0.4m	16TP04W1 SA#1 D=0.15m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	7	7.3	8	7.8	6.8	7	8
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	0.13	0.12	0.33	0.13	<0.1	<0.1	0.45
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	1.78	1.71	3.03	1.44	1.15	1.08	3.79
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	105	94.1	99.4	54.3	50	66.1	112
Beryllium	µg/g	4	8	4	4	8	0.52	0.57	0.35	0.35	0.36	0.38	0.36
Boron_	µg/g	-	-	-	-	-	2.8	<2	<2	<2	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.158	0.112	0.413	0.101	0.071	0.059	0.418
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	29.6	33.9	34.4	20.1	20.1	23.9	42.8
Cobalt	µg/g	50	300	50	50	300	12.4	13.3	11.5	8.82	8.7	9.61	11.1
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	28.9	20.3	**94.7**	16	10.2	9.78	58
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	7.66	5.22	8.49	4.3	2.42	1.73	23.3
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	9.25	10.2	12.4	6.9	6.88	5.77	14.7
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	661	657	471	441	410	403	463
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	0.97	0.83	1.11	0.81	0.71	0.79	1.12
Nickel	µg/g	45	89	100	100	500	21.9	24	31	16.2	13.9	17.8	33.8
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	56.1	50.4	41.5	30.7	31.4	41.1	51.1
Thallium	µg/g	1	1	-	-	-	<0.1	0.1	0.14	<0.1	<0.1	<0.1	0.19
Tin	µg/g	50	300	50	50	300	0.73	0.76	0.85	0.44	0.49	0.55	1.21
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.821	0.913	0.804	0.748	0.71	0.584	0.654
Vanadium	µg/g	130	130	200	200	-	49.9	55.9	52	41.4	44.8	44.5	55.1
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	78.9	65.3	74.9	53.9	48.5	46.1	70.5
Laboratory Identification Number							7052353_7052353-09	7052353_7052353-10	7052353_7052353-21	7052353_7052353-22	7052353_7052353-17	7052353_7052353-18	7052560_7052560-14

NOTES:

#1	CSR Schedule 5 Substance.
#2	Standard is pH dependent. Values shown based on median pH of 7.9
#3	CSR Schedule 10 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
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RL	Residential Land Standards
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Site specific factors include:	- Intake of contaminated soil.
	- Toxicity to soil invertebrates and plants.
	- Groundwater used for drinking water.
	- Groundwater flow to surface water used by freshwater aquatic life.
	Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP04W1 SA#2	16TP04W2 SA#1	16TP04W2 SA#2	16TP14E1SA#1	16TP14E1SA#2	16TP14E2SA#1	16TP14E2SA#2
							0.4 m	0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/29/2017	5/29/2017	5/29/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017
							16TP04W1 SA#2 D=0.4m	16TP04W2 SA#1 D=0.15m	16TP04W2 SA#2 D=0.4m	16TP14E1SA#1 D=0.15m	16TP14E1SA#2 D=0.4m	16TP14E2SA#1 D=0.15m	16TP14E2SA#2 D=0.4m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	7.9	6.7	7.1	**8.1**	7.6	7.7	7.2
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	0.1	0.12	<0.1	0.43	0.18	<0.1	<0.1
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	1.44	1.5	1.15	3.55	1.57	1.5	1.11
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	63.1	66.9	49.5	84.8	90.2	75.5	72.7
Beryllium	µg/g	4	8	4	4	8	0.37	0.34	0.44	0.22	0.42	0.37	0.33
Boron_	µg/g	-	-	-	-	-	<2	2.2	<2	<2	<2	2.8	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.116	0.135	0.081	0.412	0.175	0.145	0.125
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	21.6	19.5	22.8	32.6	28.4	22.9	21.3
Cobalt	µg/g	50	300	50	50	300	8.79	8.4	9.75	9.13	11.9	10.3	9.37
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	14.6	34.6	12.6	**134**	19.9	26.4	15
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	3.63	9.52	2.17	13.6	4.7	4.75	2.86
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	7.53	6.19	7.27	9.43	7.76	6.65	5.76
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	443	440	518	369	569	485	430
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	0.046	<0.04	0.041
Molybdenum	µg/g	10	40	10	10	40	0.69	0.88	1.11	1.62	0.92	1.07	0.64
Nickel	µg/g	45	89	100	100	500	16.5	13.8	18.4	30.3	22.1	18.4	17.4
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	36.9	43.2	33.6	39.3	52.9	45.5	46
Thallium	µg/g	1	1	-	-	-	<0.1	<0.1	<0.1	0.14	<0.1	<0.1	<0.1
Tin	µg/g	50	300	50	50	300	0.44	0.57	0.51	1.1	0.63	0.57	0.48
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.866	0.684	0.675	0.677	1.09	0.749	0.705
Vanadium	µg/g	130	130	200	200	-	43.5	39.2	43.2	45.1	50.7	44.4	43.1
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	52.3	64	52.5	62.7	89.9	69.5	68
Laboratory Identification Number							7052560_7052560-21	7052560_7052560-22	7052560_7052560-17	7052560_7052560-73	7052560_7052560-18	7052560_7052560-01	7052560_7052560-02

NOTES:

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Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP14W1SA#1		16TP14W1SA#2	16TP14W1SA#3	16TP14W2SA#1	16TP14W2SA#2	16TP14N1 SA#1
							0.15 m		0.4 m	0.7 m	0.15 m	0.4 m	0.15 m
							5/30/2017		5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/29/2017
							16TP14W1SA#1 D=0.15m	DUP #3	16TP14W1SA#2 D=0.4m	16TP14W1SA#3 D=0.7m	16TP14W2SA#1 D=0.15m	16TP14W2SA#2 D=0.4m	16TP04N1 SA#1 D=0.15m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	7.9	7.8	7.6	7.5	7	7.3	**8.6**
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	0.32	0.44	0.36	0.11	0.15	<0.1	0.68
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	3.22	3.5	3.3	1.39	1.85	1.41	4.73
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	71.8	91.5	95	62.1	73	44.4	101
Beryllium	µg/g	4	8	4	4	8	0.23	0.23	0.36	0.39	0.36	0.33	0.3
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	<2.0	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.354	0.41	0.331	0.122	0.156	0.07	0.428
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	32.6	32.8	34.9	26.7	24.7	18.5	41.3
Cobalt	µg/g	50	300	50	50	300	8.71	9.73	11.9	11	10.5	8.58	10.4
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	**87.8**	**120**	**77.5**	16.7	57	9.97	**68.6**
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	11.9	14.9	11.3	3.22	7.65	2.68	13.8
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	10.1	8.98	9.62	6.72	7.11	5.24	14.4
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	360	384	497	504	492	408	433
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	0.046	<0.040	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	1.51	1.79	1.19	0.77	0.99	0.9	1.51
Nickel	µg/g	45	89	100	100	500	23.8	27.8	26.7	20.2	20.8	14.3	33.6
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.50	<0.5	<0.5	0.5
Silver	mg/kg	20	40	20	20	40	0.22	0.21	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	28.9	29.2	40.9	37.4	41.3	26.3	41.3
Thallium	µg/g	1	1	-	-	-	0.13	0.15	0.15	<0.10	<0.1	<0.1	0.18
Tin	µg/g	50	300	50	50	300	0.91	1.24	1	0.57	0.73	0.46	1.92
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.758	0.887	1.22	0.852	1.32	1.07	1.13
Vanadium	µg/g	130	130	200	200	-	47.2	45.7	51	53.3	44	53.8	52.2
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	59.5	66	74.6	70.5	70	49.8	63.7
Laboratory Identification Number							7052353_7052353-33	7052353_7052353-34	7052353_7052353-42	7052560_7052560-19	7052353_7052353-37	7052353_7052353-38	7052353_7052353-29

NOTES:

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Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP14N1 SA#2		16TP14S1 SA#1	16TP14S1 SA#2	16TP16E1SA#1	16TP16E1SA#2	16TP16E2SA#1
							0.4 m		0.15 m	0.4 m	0.15	0.4 m	0.15 m
							5/29/2017	5/29/2017	5/29/2017	5/29/2017	5/30/2017	5/30/2017	5/30/2017
							16TP04N1 SA#2 D=0.4m	DUP #2	16TP04S1 SA#1 D=0.15m	16TP04S1 SA#2 D=0.4m	16TP16E1SA#1 D=0.15m	16TP16E1SA#2 D=0.4m	16TP16E2SA#1 D=0.15m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	7.7	8	**8.4**	**8.3**	**8.1**	7.8	6.8
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	<0.1	<0.1	0.65	0.17	0.42	0.15	0.14
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	1.34	1.67	3.75	2.96	4.54	1.58	1.73
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	75.1	72.8	80.8	83.5	89.7	63.2	60.6
Beryllium	µg/g	4	8	4	4	8	0.4	0.37	0.27	0.31	0.26	0.37	0.29
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	<2	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.162	0.158	0.34	0.321	0.395	0.116	0.132
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	22.9	23.2	32	33	28.7	25.4	21
Cobalt	µg/g	50	300	50	50	300	9.72	9.13	7.88	9.49	9.02	11.1	8.83
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	14.7	15.3	**81.4**	28.9	**63.1**	17.2	32.2
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	3.16	3.29	13.5	3.85	11.5	2.91	6.8
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	7.63	7.55	11.2	12.9	11.6	6.43	5.42
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	549	449	350	398	409	466	408
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	0.92	0.82	1.66	0.78	0.96	0.7	0.86
Nickel	µg/g	45	89	100	100	500	17.1	16.5	24.7	25	23.4	18.4	16
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	0.53	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	45.5	45.3	44.5	54.3	34.4	35.6	46.1
Thallium	µg/g	1	1	-	-	-	<0.1	<0.1	0.14	0.16	0.16	<0.1	<0.1
Tin	µg/g	50	300	50	50	300	0.5	0.49	1.63	0.43	0.88	0.58	0.58
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.913	0.856	1.61	0.864	0.62	0.719	0.625
Vanadium	µg/g	130	130	200	200	-	43.1	43.9	42.9	47.9	47.1	49.6	42.3
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	80.1	67.3	54.9	64.6	58.9	57.8	54.6
Laboratory Identification Number							7052353_7052353-30	7052353_7052353-25	7052353_7052353-26	7052560_7052560-13	7052560_7052560-09	7052560_7052560-10	7052560_7052560-05

NOTES:

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Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP16E2SA#2	16TP16N1SA#1	16TP16N1SA#2	16TP16S1SA#1	16TP16S1SA#2	16TP16W1SA#1	16TP16W1SA#2
							0.4 m	0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017
							16TP16E2SA#2 D=0.4m	16TP16N1SA#1 D=0.15m	16TP16N1SA#2 D=0.4m	16TP16S1SA#1 D=0.15m	16TP16S1SA#2 D=0.4m	16TP16W1SA#1 D=0.15m	16TP16W1SA#2 D=0.4m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	7.2	**8.2**	**8.6**	**8.2**	**8.4**	**8.1**	8
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	<0.1	0.44	0.3	0.58	0.19	0.31	0.22
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	1.17	4.77	5.03	4.47	3.34	3.77	2.92
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	50.1	107	86.9	86.8	82.9	68	69.7
Beryllium	µg/g	4	8	4	4	8	0.26	0.29	0.27	0.21	0.3	0.23	0.24
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	<2	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.05	0.512	0.506	0.43	0.288	0.422	0.242
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	18.9	45.7	43.5	33.8	31	35.9	21.7
Cobalt	µg/g	50	300	50	50	300	8.18	11.6	12.3	9.02	11.5	10.2	8.56
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	8.63	42.1	41	**71.4**	26.4	**136**	23.9
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	1.71	7.12	4.55	16.3	4.29	13.9	4.74
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	5.44	12	13	11.4	9.86	10.4	8.08
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	364	444	398	394	443	351	392
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	0.041	0.069	0.042	0.047	0.041
Molybdenum	µg/g	10	40	10	10	40	0.64	1.16	1.5	1.3	1.03	1.38	0.65
Nickel	µg/g	45	89	100	100	500	13.2	34.2	36.6	27	27.3	29.5	17.3
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	<0.5	0.57	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	0.23	<0.2	<0.2	<0.2	0.23	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	27.4	37.8	34.4	25	34.6	32.7	31.5
Thallium	µg/g	1	1	-	-	-	<0.1	0.21	0.2	0.19	0.16	0.17	0.11
Tin	µg/g	50	300	50	50	300	0.41	0.87	0.35	2.81	0.52	0.65	0.5
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	1.31	0.61	0.728	0.741	0.714	0.795	0.788
Vanadium	µg/g	130	130	200	200	-	39.3	56.1	58.3	48.4	53.8	47.1	41.7
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	43.2	76.2	66.3	62	65.7	57.2	51.3
Laboratory Identification Number							7052560_7052560-06	7052560_7052560-33	7052560_7052560-34	7052560_7052560-37	7052560_7052560-38	7052560_7052560-29	7052560_7052560-30

NOTES:

#1	CSR Schedule 5 Substance.
#2	Standard is pH dependent. Values shown based on median pH of 7.9
#3	CSR Schedule 10 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
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Site specific factors include:	- Intake of contaminated soil.
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	- Groundwater flow to surface water used by freshwater aquatic life.
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Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP16W2SA#1	16TP16W2SA#2	16TP17E1SA#1	16TP17E1SA#2	16TP17E2SA#1	16TP17E2SA#2	16TP17W1SA#1
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m	0.15 m
							5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017
							16TP16W2SA#1 D=0.15m	16TP16W2SA#2 D=0.4m	16TP17E1SA#1 D=0.15m	16TP17E1SA#2 D=0.4m	16TP17E2SA#1 D=0.15m	16TP17E2SA#2 D=0.4m	16TP17W1SA#1 D=0.15m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	6.9	7	8	**8.1**	7.4	7.3	7.9
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	<0.1	<0.1	0.27	0.3	1.22	<0.1	0.17
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	1.17	1.23	3.45	3.39	2.82	0.97	3.25
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	53.2	64.4	71.9	78.8	82.5	42.9	52.1
Beryllium	µg/g	4	8	4	4	8	0.3	0.34	0.24	0.23	0.32	0.25	0.18
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	<2	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.068	0.062	0.354	0.307	0.305	0.05	0.338
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	19.7	22.1	30	29.1	27.4	19	31.4
Cobalt	µg/g	50	300	50	50	300	8.73	10.2	9.18	9.06	10.7	7.99	8.43
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	11.3	11.9	54	41.1	36.3	9.54	**72.1**
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	2.68	2.69	9.43	7.36	38.5	1.78	10.1
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	5.84	5.94	9.97	10.2	6.84	4.72	10.9
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	398	507	382	401	473	331	316
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	0.042	<0.04	<0.04	0.495	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	0.76	0.8	1.05	0.85	1.06	0.67	1
Nickel	µg/g	45	89	100	100	500	14.5	17.1	24.6	22.8	21	13.7	22.8
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	34.5	38.3	29.2	29.6	38.1	28.5	27.4
Thallium	µg/g	1	1	-	-	-	<0.1	<0.1	0.14	0.14	<0.1	<0.1	0.13
Tin	µg/g	50	300	50	50	300	0.51	0.5	0.75	0.72	0.82	0.49	0.48
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.752	0.868	0.704	0.694	0.789	0.588	1.23
Vanadium	µg/g	130	130	200	200	-	38.3	45.3	43.7	44.7	46.5	38.1	41.9
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	46.6	47.4	59.4	55.1	**506**	43.6	50.8
Laboratory Identification Number							7052560_7052560-25	7052560_7052560-26	7052560_7052560-53	7052560_7052560-54	7052560_7052560-49	7052560_7052560-50	7052560_7052560-45

NOTES:

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	Most stringent applicable site specific standard is shown.
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Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP17W1SA#2	16TP17W2SA#1	16TP17W2SA#2	16TP22E1SA#1	16TP22E1SA#2	16TP22E2SA#1	16TP22E2SA#2
							0.4 m	0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017	5/30/2017
							16TP17W1SA#2 D=0.4m	16TP17W2SA#1 D=0.15m	16TP17W2SA#2 D=0.4m	16TP22E1SA#1 D=0.15m	16TP22E1SA#2 D=0.4m	16TP22E2SA#1 D=0.15m	16TP22E2SA#2 D=0.4m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	**8.5**	7	7	**8.2**	7.7	7.9	**9.1**
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	0.44	<0.1	<0.1	0.55	0.11	<0.1	<0.1
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	4.11	1.08	1.47	4.21	1.16	1.08	0.91
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	72.9	63.6	63.7	78.6	58.6	52.5	56
Beryllium	µg/g	4	8	4	4	8	0.21	0.26	0.38	0.21	0.27	0.26	0.2
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	<2	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.348	0.077	0.08	0.416	0.071	0.079	0.063
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	26.6	19.7	23.8	28.3	19.6	19.2	15.9
Cobalt	µg/g	50	300	50	50	300	8.06	8.41	10.9	8.6	8.49	8.45	7.48
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	30.5	10.8	11.8	**83.4**	10.2	11.5	7.96
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	21.6	6.09	3.11	13.3	2.25	2.24	1.44
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	10.9	5.5	6.5	10.8	5.12	4.79	4.12
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	375	358	540	393	353	342	329
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	0.042	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	0.8	0.76	1.09	1.33	0.65	0.6	0.67
Nickel	µg/g	45	89	100	100	500	20.5	14.7	19.3	24.4	14	15.8	12.2
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	30.1	41.2	32.4	33.4	38.9	31.5	30.7
Thallium	µg/g	1	1	-	-	-	0.14	<0.1	<0.1	0.15	<0.1	<0.1	<0.1
Tin	µg/g	50	300	50	50	300	0.93	0.58	0.51	1.3	0.49	0.45	0.42
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.677	0.564	0.952	0.724	0.648	0.531	0.372
Vanadium	µg/g	130	130	200	200	-	47.6	38.9	47.3	47	39	37.7	35
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	54.4	57.6	53	62.7	40.5	43.9	37.7
Laboratory Identification Number							7052560_7052560-46	7052560_7052560-41	7052560_7052560-42	7052560_7052560-61	7052560_7052560-62	7052560_7052560-57	7052560_7052560-58

NOTES:

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Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP22W1SA#1		16TP22W1SA#2	16TP22W2SA#1	16TP22W2SA#2	16TP28E1 SA#1	16TP28E1 SA#2
							0.15 m		0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/30/2017		5/30/2017	5/30/2017	5/30/2017	5/31/2017	5/31/2017
							16TP22W1SA#1 D=0.15m	DUP #4	16TP22W1SA#2 D=0.4m	16TP22W2SA#1 D=0.15m	16TP22W2SA#2 D=0.4m	16TP28E1 SA#1 D=0.15m	16TP28E1 SA#2 D=0.4m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	**8.2**	**8.3**	**8.1**	7.5	7.4	8	6.9
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	0.45	0.41	0.15	<0.1	<0.1	<0.1	<0.1
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	4.19	3.9	2.39	1.15	1.31	1.97	1.82
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	85.7	79.9	66.1	56.5	52.4	52.5	83
Beryllium	µg/g	4	8	4	4	8	0.21	0.21	0.28	0.25	0.25	0.35	0.54
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	<2	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.467	0.428	0.218	0.102	0.075	0.121	0.104
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	32.2	33.8	29.8	19.2	19.3	22.5	27.5
Cobalt	µg/g	50	300	50	50	300	9.71	8.96	9.78	8.36	8.84	8.18	11.3
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	**96.1**	**84.5**	22	30.9	14.3	19.5	17.6
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	13.1	12	3.65	4.24	3.72	2.89	3.31
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	10.3	9.89	7.93	4.92	4.9	8.32	9.31
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	386	378	379	370	362	366	523
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	1.45	1.33	0.83	1.28	0.64	0.55	0.68
Nickel	µg/g	45	89	100	100	500	28.6	26.1	21.2	14.8	14.2	17.9	23.4
Selenium	µg/g	1	2.9	3	3	10	0.51	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	0.23	0.21	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	32.6	30.9	27.3	36.3	29.8	35.6	41.4
Thallium	µg/g	1	1	-	-	-	0.18	0.16	0.12	<0.1	<0.1	<0.1	0.11
Tin	µg/g	50	300	50	50	300	1.18	1.13	0.49	0.46	0.49	0.43	0.62
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	1.23	0.726	0.666	0.508	0.585	0.521	0.839
Vanadium	µg/g	130	130	200	200	-	45.8	45.9	44.2	37.7	42.3	38.6	46.3
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	61.8	60.6	51.7	48.1	42.9	45.2	57.3
Laboratory Identification Number							7052560_7052560-69	7052560_7052560-74	7052560_7052560-70	7052560_7052560-65	7052560_7052560-66	7060116_7060116-17	7060116_7060116-18

NOTES:

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Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP28E2 SA#1	16TP28E2 SA#2	16TP28N1 SA#1	16TP28N1 SA#2	16TP28S1 SA#1	16TP28S1 SA#2	16TP28W1 SA#1
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m	0.15 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP28E2 SA#1 D=0.15m	16TP28E2 SA#2 D=0.4m	16TP28N1 SA#1 D=0.15m	16TP28N1 SA#2 D=0.4m	16TP28S1 SA#1 D=0.15m	16TP28S1 SA#2 D=0.4m	16TP28W1 SA#1 D=0.15m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	7.4	7.5	**9.1**	7.8	**8.9**	**8.2**	**8.3**
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	<0.1	<0.1	0.12	<0.1	0.11	<0.1	0.75
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	1.59	1.74	2.27	1.42	2.6	1.52	5.71
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	62.3	75.6	38.1	62.1	34.6	59.6	98.7
Beryllium	µg/g	4	8	4	4	8	0.46	0.55	0.25	0.45	0.21	0.45	0.29
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	<2	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.073	0.097	0.141	0.07	0.148	0.091	0.424
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	26.4	26.7	15.4	26.5	15.8	22.6	30.8
Cobalt	µg/g	50	300	50	50	300	11.4	10.7	4.83	8.99	4.93	9.39	8.72
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	15.6	15.4	15.4	12.7	14.9	13.8	45.7
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	2.58	3.09	3.64	2.36	2.72	2.52	12.9
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	8.4	8.89	9.08	8.58	8.16	8.41	13.9
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	468	489	240	416	228	431	402
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	0.67	0.61	0.49	0.6	0.38	0.62	1.18
Nickel	µg/g	45	89	100	100	500	22.3	21.9	12.3	17.7	13.8	19.2	24
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	34.5	35.9	32.1	34.1	34.4	34.5	86
Thallium	µg/g	1	1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.16
Tin	µg/g	50	300	50	50	300	0.58	0.59	0.43	0.59	0.28	0.57	1.6
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.626	0.735	0.456	0.666	0.523	0.641	0.604
Vanadium	µg/g	130	130	200	200	-	41.2	43.7	27	38	28.8	38.4	48.7
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	53.8	54.8	33.6	48.3	30.4	51.3	61.6
Laboratory Identification Number							7060116_7060116-13	7060116_7060116-14	7060116_7060116-01	7060116_7060116-02	7060116_7060116-05	7060116_7060116-06	7060116_7060116-09

NOTES:

#1	CSR Schedule 5 Substance.
#2	Standard is pH dependent. Values shown based on median pH of 7.9
#3	CSR Schedule 10 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil.
	- Toxicity to soil invertebrates and plants.
	- Groundwater used for drinking water.
	- Groundwater flow to surface water used by freshwater aquatic life.
	Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP28W1 SA#2	16TP30E1 SA#1	16TP30E1 SA#2	16TP30E2 SA#1	16TP30E2 SA#2	16TP30S1 SA#1	16TP30S1 S
							0.4 m	0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/201
							16TP28W1 SA#2 D=0.4m	16TP30E1 SA#1 D=0.15m	16TP30E1 SA#2 D=0.4m	16TP30E2 SA#1 D=0.15m	16TP30E2 SA#2 D=0.4m	16TP30S1 SA#1 D=0.15m	16TP30S1 SA#2 D=0.4m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	**9**	7.8	**8.4**	7.1	7.3	7.8	**8.4**
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	0.25	0.39	0.22	0.19	0.29	0.32	0.23
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	3.85	3.37	3.73	2.38	2.56	3.42	4.43
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	78.8	107	120	108	127	89.8	86.4
Beryllium	µg/g	4	8	4	4	8	0.27	0.48	0.52	0.53	0.57	0.36	0.27
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	<2	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.399	0.197	0.19	0.165	0.16	0.239	0.379
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	33.6	26.8	31.5	29.8	32.6	24.7	32.1
Cobalt	µg/g	50	300	50	50	300	10.1	8.04	9.23	10.8	12.2	7.31	9.15
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	30.4	24	24	21.1	19.6	30.1	33.5
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	4.27	5.51	5.98	5.67	5.35	8.73	4.48
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	13	12.3	14.4	12.8	12.5	11.9	12.6
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	353	373	440	471	531	361	373
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	0.071	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	1.37	0.57	0.45	0.84	0.76	0.68	1.13
Nickel	µg/g	45	89	100	100	500	28.3	22.4	24.8	23.1	24.1	19.4	26.7
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	53.8	32.5	37.2	46.5	51.4	26.4	34.6
Thallium	µg/g	1	1	-	-	-	0.15	0.13	0.14	0.13	0.13	0.14	0.16
Tin	µg/g	50	300	50	50	300	0.48	0.49	0.51	0.71	0.7	0.93	0.49
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.689	0.68	0.708	0.951	0.964	0.694	0.552
Vanadium	µg/g	130	130	200	200	-	48.8	39.3	43.9	46.3	52.9	38.1	47.4
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	60.1	51.1	56.3	66	74.5	54.2	53.4
Laboratory Identification Number							7060116_7060116-10	7060116_7060116-37	7060116_7060116-38	7060116_7060116-33	7060116_7060116-34	7060116_7060116-21	7060116_7060116-22

NOTES:

#1	CSR Schedule 5 Substance.
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#3	CSR Schedule 10 Substance.
-	Not analyzed or no guideline/standard exists.
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	Most stringent applicable site specific standard is shown.
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Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	SA#2	16TP30W1 SA#1	16TP30W1 SA#2	16TP30W2 SA#1	16TP30W2 SA#2	16TP34E1 SA#1	16TP34E1 SA#2
								0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							7	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017
							Dupe #5	16TP30W1 SA#1 D=0.15m	16TP30W1 SA#2 D=0.4m	16TP30W2 SA#1 D=0.15m	16TP30W2 SA#2 D=0.4m	16TP34E1 SA#1 D=0.15m	16TP34E1 SA#2 D=0.4m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	**8.3**	7.9	7.8	7.5	**8.5**	7.6	7.9
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	0.28	0.47	0.32	0.19	0.11	0.48	0.24
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	4.28	3.96	3.92	2.64	2.12	3.7	2.72
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	100	82.3	117	84.9	97.2	93.5	113
Beryllium	µg/g	4	8	4	4	8	0.25	0.32	0.48	0.39	0.47	0.32	0.52
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	3	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.335	0.36	0.337	0.2	0.136	0.336	0.201
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	29.6	32.1	35.9	24.4	29.9	23.7	26.7
Cobalt	µg/g	50	300	50	50	300	8.74	8.79	10.8	7.36	12.9	7.45	8.84
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	28.7	**93.5**	41.1	28.6	17.8	**169**	27.8
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	4.94	15.5	8.46	6.83	3.89	19	6.81
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	11.7	11.9	14.6	10.9	9.3	9.85	13.1
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	342	370	464	365	583	395	427
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	0.89	1.65	0.97	0.63	0.95	1.75	0.52
Nickel	µg/g	45	89	100	100	500	25.2	26.1	32	19.3	24	19.8	22.5
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	53.1	50.3	32.1	30.2	58.8	34.3	33.1
Thallium	µg/g	1	1	-	-	-	0.18	0.14	0.18	0.12	0.1	0.11	0.14
Tin	µg/g	50	300	50	50	300	0.53	1.1	0.77	0.52	0.73	1.11	0.53
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.572	0.744	0.976	0.699	0.71	0.808	0.862
Vanadium	µg/g	130	130	200	200	-	46.7	43.6	47.8	34.5	56.4	35.7	36.9
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	52	59.9	63.4	47	63.5	59	55.6
Laboratory Identification Number							7060116_7060116-AJ	7060116_7060116-29	7060116_7060116-30	7060116_7060116-25	7060116_7060116-26	7060116_7060116-53	7060116_7060116-54

NOTES:

#1	CSR Schedule 5 Substance.
#2	Standard is pH dependent. Values shown based on median pH of 7.9
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-	Not analyzed or no guideline/standard exists.
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Site specific factors include:	- Intake of contaminated soil.
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	- Groundwater flow to surface water used by freshwater aquatic life.
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Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP34E2 SA#1	16TP34E2 SA#2	16TP34N1 SA#1	16TP34N1 SA#2	16TP34S1 SA#1	16TP34S1 SA#2	16TP34W1 SA#1
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m	0.15 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP34E2 SA#1 D=0.15m	16TP34E2 SA#2 D=0.4m	16TP34N1 SA#1 D=0.15m	16TP34N1 SA#2 D=0.4m	16TP34S1 SA#1 D=0.15m	16TP34S1 SA#2 D=0.4m	16TP34W1 SA#1 D=0.15m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	8	7.2	**8.3**	**8.5**	**8.2**	**8.5**	**8.1**
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	0.13	0.1	0.69	0.34	0.67	0.23	0.36
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	1.88	2.01	4.48	4.18	4.01	3.35	4.96
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	92.4	68.8	75.5	123	87.6	107	108
Beryllium	µg/g	4	8	4	4	8	0.43	0.4	0.24	0.36	0.49	0.36	0.36
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	<2	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.17	0.133	0.385	0.359	0.399	0.343	0.381
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	18.4	21.5	35.1	41.1	36.7	41.4	31.7
Cobalt	µg/g	50	300	50	50	300	5.96	6.59	8.95	10.8	9.15	10.7	9.23
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	15.5	14.9	**106**	33.8	**94.4**	33.1	33.1
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	5.13	4.7	22.8	5.51	16.8	5.27	6.27
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	9.47	10.1	13	15.8	12.4	13.4	14.3
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	381	344	362	399	369	367	416
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	0.38	0.37	1.81	0.84	2.9	0.85	1.18
Nickel	µg/g	45	89	100	100	500	13	15.5	26.9	30.1	29.6	36	24.2
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	0.72	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	29.8	22.3	30.3	41.8	30.7	35.9	33.2
Thallium	µg/g	1	1	-	-	-	<0.1	<0.1	0.15	0.2	0.17	0.18	0.18
Tin	µg/g	50	300	50	50	300	0.42	0.38	3.83	0.49	2.02	0.49	0.53
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.848	0.86	1.32	0.631	0.878	0.667	0.885
Vanadium	µg/g	130	130	200	200	-	29.1	31.2	47.9	52.5	49.2	49.6	52.9
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	47.3	42.2	58.7	61	63.2	60.5	63
Laboratory Identification Number							7060116_7060116-49	7060116_7060116-50	7060116_7060116-41	7060116_7060116-42	7060116_7060116-45	7060116_7060116-46	7060116_7060116-61

NOTES:

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Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP34W1 SA#2	16TP34W2 SA#1	16TP34W2 SA#2	16TP37E1 SA#1	16TP37E1 SA#2	16TP37E2 SA#1	16TP37E2 SA#2
							0.4 m	0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP34W1 SA#2 D=0.4m	16TP34W2 SA#1 D=0.15m	16TP34W2 SA#2 D=0.4m	16TP37E1 SA#1 D=0.15m	16TP37E1 SA#2 D=0.4m	16TP37E2 SA#1 D=0.15m	16TP37E2 SA#2 D=0.4m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	**8.1**	7.4	**8.1**	**8.4**	**8.2**	7.4	7.5
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	0.36	0.22	0.17	0.36	0.42	0.13	0.15
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	5.13	2.65	3.14	4.41	4.28	2.84	3.31
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	109	107	112	81.7	137	89.5	110
Beryllium	µg/g	4	8	4	4	8	0.32	0.5	0.53	0.26	0.45	0.43	0.48
Boron_	µg/g	-	-	-	-	-	<2	2.6	<2	<2	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.399	0.173	0.159	0.421	0.448	0.167	0.197
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	37.3	27.2	28.6	31.5	38.7	20.9	27.4
Cobalt	µg/g	50	300	50	50	300	9.92	9.08	9.21	8.76	12.6	7.39	9.21
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	37.3	35.9	24.4	**89.9**	43.4	22.2	24
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	5.97	9.7	6.71	10.3	10.9	5.21	5.9
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	14.8	14.3	15	12.2	16	9.57	12.8
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	428	431	419	361	510	359	404
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	0.9	0.61	0.39	1.47	1.01	0.47	0.44
Nickel	µg/g	45	89	100	100	500	27	23.4	24.9	26.3	32.8	17.5	23.6
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	0.24	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	38.1	39.9	36.2	50.5	42.3	28	31.9
Thallium	µg/g	1	1	-	-	-	0.19	0.15	0.15	0.14	0.2	0.12	0.15
Tin	µg/g	50	300	50	50	300	0.54	0.74	0.54	0.91	1.06	0.43	0.48
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.615	0.918	0.877	0.974	0.971	0.896	1.07
Vanadium	µg/g	130	130	200	200	-	57.5	38.1	39	48.2	58.3	33.2	40.6
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	65.6	56.7	54.4	60.6	74.4	45	54.5
Laboratory Identification Number							7060116_7060116-62	7060116_7060116-57	7060116_7060116-58	7060116_7060116-85	7060116_7060116-86	7060116_7060116-81	7060116_7060116-82

NOTES:

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Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP37N1 SA#1	16TP37N1 SA#2		16TP37S1 SA#1	16TP37S1 SA#2	16TP37W1 SA#1	16TP37W1 SA#2
							0.15 m	0.4 m		0.15 m	0.4 m	0.15 m	0.4 m
							5/31/2017	5/31/2017		5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP37N1 SA#1 D=0.15m	16TP37N1 SA#2 D=0.4m	Dupe #6	16TP37S1 SA#1 D=0.15m	16TP37S1 SA#2 D=0.4m	16TP37W1 SA#1 D=0.15m	16TP37W1 SA#2 D=0.4m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	**8.5**	**8.9**	**8.9**	**8.4**	**8.6**	**8.3**	8
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	0.63	0.16	0.15	0.57	0.29	0.43	0.6
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	4.82	3.38	3.66	4.9	4.66	4.62	5.28
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	151	78.5	69.2	104	103	87.2	103
Beryllium	µg/g	4	8	4	4	8	0.41	0.3	0.26	0.33	0.33	0.32	0.38
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	<2	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.497	0.433	0.475	0.416	0.353	0.432	0.466
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	48.1	33.6	34.6	32.4	36.2	34.7	34.3
Cobalt	µg/g	50	300	50	50	300	12.6	9.19	9.27	9.75	10.7	9.66	10.5
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	**105**	30.9	30.8	47.2	44.4	**90.4**	**117**
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	15.3	4.04	4.25	11.7	5.77	12.7	17.5
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	16	12.7	13.6	13.9	14.6	13.1	13.6
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	454	342	377	433	401	378	441
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	1.63	1.28	1.23	1.26	1.04	1.45	1.61
Nickel	µg/g	45	89	100	100	500	39.4	28.3	30.9	26.5	31.2	29.3	28.8
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Silver	mg/kg	20	40	20	20	40	0.23	<0.2	<0.2	<0.2	<0.2	<0.2	0.21
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	58.3	64.9	44.1	38.5	38.9	43.8	38.8
Thallium	µg/g	1	1	-	-	-	0.23	0.16	0.15	0.18	0.19	0.17	0.17
Tin	µg/g	50	300	50	50	300	3.22	0.35	0.36	1.3	0.6	1.1	2.14
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.875	0.764	0.778	0.657	0.633	0.651	0.871
Vanadium	µg/g	130	130	200	200	-	60.9	49.3	50.7	49.3	57	50.3	47.8
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	78.2	58.4	62.2	66.3	63.1	67.3	73.8
Laboratory Identification Number							7060116_7060116-65	7060116_7060116-66	7060116_7060116-AK	7060116_7060116-69	7060116_7060116-70	7060116_7060116-77	7060116_7060116-78

NOTES:

#1	CSR Schedule 5 Substance.
#2	Standard is pH dependent. Values shown based on median pH of 7.9
#3	CSR Schedule 10 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
PL	Park Land Standards
RL	Residential Land Standards
CL	Commercial Land Standards
Site specific factors include:	- Intake of contaminated soil.
	- Toxicity to soil invertebrates and plants.
	- Groundwater used for drinking water.
	- Groundwater flow to surface water used by freshwater aquatic life.
	Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP37W2 SA#1	16TP37W2 SA#2	16TP39E1 SA#1	16TP39E1 SA#2	16TP39E2 SA#1	16TP39E2 SA#2	16TP39N1 SA#1
							0.15 m	0.4 m	0.15 m	0.4 m	0.15 m	0.4 m	0.15 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP37W2 SA#1 D=0.15m	16TP37W2 SA#2 D=0.4m	16TP39E1 SA#1 D=0.15m	16TP39E1 SA#2 D=0.4m	16TP39E2 SA#1 D=0.15m	16TP39E2 SA#2 D=0.4m	16TP39N1 SA#1 D=0.15m
Physical Parameters				-	-	-							
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	6.9	7.3	7.7	**8.1**	7.3	7.3	**8.1**
Metals				-	-	-							
Antimony	µg/g	20	40	20	20	40	0.25	0.18	0.41	0.18	0.14	0.14	0.82
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	3.72	3.44	4.56	3.18	2.08	2.3	4.91
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	106	77.7	133	126	142	71.3	82.4
Beryllium	µg/g	4	8	4	4	8	0.61	0.42	0.51	0.49	0.4	0.38	0.26
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	<2	2.1	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.167	0.154	0.389	0.223	0.265	0.129	0.468
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	30.7	29.3	33.1	26.1	16.6	21.9	31.2
Cobalt	µg/g	50	300	50	50	300	9.94	8.89	11.2	8.52	6.24	6.82	8.69
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	37.3	23.4	**76.4**	23.4	36.6	17.4	**108**
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	8.32	5.47	12.5	6.41	7.24	4.34	21.4
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	13.6	13	14.1	12.7	9.35	8.44	11.5
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	418	355	507	444	437	335	411
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	0.59	0.45	1.18	0.45	0.56	0.37	1.98
Nickel	µg/g	45	89	100	100	500	25.7	26.9	27.5	22	12.9	16.4	25.1
Selenium	µg/g	1	2.9	3	3	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	30.8	26.9	39.3	40.8	35.7	25.5	54
Thallium	µg/g	1	1	-	-	-	0.16	0.14	0.19	0.15	0.1	0.11	0.15
Tin	µg/g	50	300	50	50	300	0.67	0.42	1.06	0.56	0.51	0.4	2.46
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	1.55	0.619	1.03	1.11	1.05	3.83	0.574
Vanadium	µg/g	130	130	200	200	-	41.6	40.2	47.6	38.5	26.9	30	46.6
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	50.4	48	67.2	58.6	60.6	40.4	62
Laboratory Identification Number							7060116_7060116-73	7060116_7060116-74	7060116_7060116-AF	7060116_7060116-AG	7060116_7060116-AB	7060116_7060116-AC	7060116_7060116-89

NOTES:

#1	CSR Schedule 5 Substance.
#2	Standard is pH dependent. Values shown based on median pH of 7.9
#3	CSR Schedule 10 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use
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Site specific factors include:	- Intake of contaminated soil.
	- Toxicity to soil invertebrates and plants.
	- Groundwater used for drinking water.
	- Groundwater flow to surface water used by freshwater aquatic life.
	Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 2: Soil Analytical Results - Metals

Parameter	Unit	CCME - Residential/ Parkland	CCME - Commercial	CSR - PL	CSR - RL	CSR - CL	16TP39N1 SA#2	16TP39W1 SA#1	16TP39W1 SA#2	16TP39W2 SA#1	16TP39W2 SA#2
							0.4 m	0.15 m	0.4 m	0.15 m	0.4 m
							5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017
							16TP39N1 SA#2 D=0.4m	16TP39W1 SA#1 D=0.15m	16TP39W1 SA#2 D=0.4m	16TP39W2 SA#1 D=0.15m	16TP39W2 SA#2 D=0.4m
Physical Parameters				-	-	-					
pH (1:2 H2O Solution)	pH Units	6-8	6-8	-	-	-	**8.6**	7.8	7.9	7.4	7.8
Metals				-	-	-					
Antimony	µg/g	20	40	20	20	40	0.22	0.68	1.01	0.21	0.2
Arsenic	µg/g	12	12	15 #1	15 #1	15 #1	4.25	5.68	4.56	4.08	3.7
Barium	µg/g	500	2000	400 #1	400 #1	400 #1	91.5	98	106	116	108
Beryllium	µg/g	4	8	4	4	8	0.29	0.32	0.37	0.5	0.46
Boron_	µg/g	-	-	-	-	-	<2	<2	<2	<2	<2
Cadmium	µg/g	10	22	3 #1,2	3 #1,2	25 #1,2	0.402	0.537	0.319	0.219	0.215
Chromium	µg/g	64	87	60 #1	60 #1	60 #1	39.4	36.1	26.7	32.3	30.1
Cobalt	µg/g	50	300	50	50	300	10.9	10.5	9.16	10.1	9.26
Copper	µg/g	63	91	150 #1,2	150 #1,2	250 #1,2	35.5	**164**	56.8	34.3	27
Lead	µg/g	140	260	400 #1,2	400 #1,2	700 #1,2	4.55	20.8	9.39	7.84	6.24
Lithium	µg/g	-	-	1600 #3	1600 #3	20,000 #3	13	12.8	12.1	14.1	13.7
Manganese	µg/g	-	-	1800 #3	1800 #3	19,000 #3	366	402	377	430	428
Mercury	mg/kg	6.6	24	15 #1	15 #1	40 #1	<0.04	<0.04	<0.04	<0.04	<0.04
Molybdenum	µg/g	10	40	10	10	40	1.18	1.96	1.85	0.6	0.63
Nickel	µg/g	45	89	100	100	500	33.2	31.7	26.3	28.4	25.7
Selenium	µg/g	1	2.9	3	3	10	<0.5	0.53	<0.5	<0.5	<0.5
Silver	mg/kg	20	40	20	20	40	<0.2	0.24	0.2	<0.2	<0.2
Strontium	µg/g	-	-	47,000 #3	47,000 #3	100,000 #3	67.2	43.5	31.3	33.7	32.4
Thallium	µg/g	1	1	-	-	-	0.18	0.18	0.15	0.16	0.16
Tin	µg/g	50	300	50	50	300	0.45	1.9	0.81	0.57	0.47
Uranium	µg/g	23	33	16 #3	16 #3	200 #3	0.781	0.818	0.742	0.697	0.684
Vanadium	µg/g	130	130	200	200	-	50.1	49.5	42.8	43.5	43.4
Zinc	µg/g	200	360	450 #1,2	450 #1,2	600 #1,2	60.1	70.4	58	59.3	56.9
Laboratory Identification Number							7060116_7060116-90	7060116_7060116-97	7060116_7060116-98	7060116_7060116-93	7060116_7060116-94

NOTES:

#1	CSR Schedule 5 Substance.
#2	Standard is pH dependent. Values shown based on median pH of 7.9
#3	CSR Schedule 10 Substance.
-	Not analyzed or no guideline/standard exists.
<	Concentration is less than the laboratory detection limit indicated.
CCME	Canadian Council of Ministers of the Environment (CCME) (Updated 2015). Soil Quality Guidelines for the Protection of Environmental and Human Health, for coarse soils under Residential/Parkland and Commercial land use
CSR	BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 184/2016, July 19, 2016 - Schedules 4, 5 and 10).
PL	Park Land Standards
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Site specific factors include:	- Intake of contaminated soil.
	- Toxicity to soil invertebrates and plants.
	- Groundwater used for drinking water.
	- Groundwater flow to surface water used by freshwater aquatic life.
	Most stringent applicable site specific standard is shown.
Bold	Bold and shaded indicates an exceedance of the CCME guideline or CSR standard

Table 4: Soil Quality Assurance/Quality Control Analytical Results

Parameter	Units	EQL	16TP02W1 SA#1 0.15 m 5/29/2017	DUP #1 5/29/2017	RPD %	16TP14N1 SA#2 0.4 m 5/29/2017	DUP #2 5/29/2017	RPD %	16TP14W1SA#1 0.15 m 5/30/2017	DUP #3 5/30/2017	RPD %	16TP22W1SA#1 0.15 m 5/30/2017	DUP #4 5/30/2017	RPD %	16TP30S1 SA#2 0.4 m 5/31/2017	Dupe #5 5/31/2017	RPD %	16TP37N1 SA#2 0.4 m 5/31/2017	Dupe #6 5/31/2017	RPD %
Physical Parameters																				
pH	pH Units	0.1	8	7.9	1	7.7	8	4	7.9	7.8	1	8.2	8.3	1	8.4	8.3	1	8.9	8.9	0
Percentage Solids	%	0.1	96.9	96.2	1	89.9	94	4	97	98.5	2	98.6	97.8	1	95.9	94.4	2	97.1	96.9	0
Metals																				
Antimony	µg/g	0.1	0.66	0.63	5	<0.1	<0.1	-	0.32	0.44	-	0.45	0.41	-	0.23	0.28	-	0.16	0.15	-
Arsenic	µg/g	0.4	3.97	4.08	3	1.34	1.67	-	3.22	3.5	8	4.19	3.9	7	4.43	4.28	3	3.38	3.66	8
Barium	µg/g	1	102	94.1	8	75.1	72.8	3	71.8	91.5	24	85.7	79.9	7	86.4	100	15	78.5	69.2	13
Beryllium	µg/g	0.1	0.37	0.34	-	0.4	0.37	-	0.23	0.23	-	0.21	0.21	-	0.27	0.25	-	0.3	0.26	-
Boron_	µg/g	2	2.3	<2	-	<2	<2	-	<2	<2	0	<2	<2	-	<2	<2	-	<2	<2	-
Cadmium	µg/g	0.04	0.424	0.408	4	0.162	0.158	-	0.354	0.41	15	0.467	0.428	9	0.379	0.335	12	0.433	0.475	9
Chromium	µg/g	1	41	36.5	12	22.9	23.2	1	32.6	32.8	1	32.2	33.8	5	32.1	29.6	8	33.6	34.6	3
Cobalt	µg/g	0.1	12.4	11.6	7	9.72	9.13	6	8.71	9.73	11	9.71	8.96	8	9.15	8.74	5	9.19	9.27	1
Copper	µg/g	0.2	96.8	86.5	11	14.7	15.3	4	87.8	120	31	96.1	84.5	13	33.5	28.7	15	30.9	30.8	0
Lead	µg/g	0.2	15.8	14.1	11	3.16	3.29	4	11.9	14.9	22	13.1	12	9	4.48	4.94	10	4.04	4.25	5
Lithium	µg/g	0.1	14.3	13.3	7	7.63	7.55	1	10.1	8.98	12	10.3	9.89	4	12.6	11.7	7	12.7	13.6	7
Manganese	µg/g	0.4	521	483	8	549	449	20	360	384	6	386	378	2	373	342	9	342	377	10
Mercury	mg/kg	0.04	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-
Molybdenum	µg/g	0.1	1.49	1.46	2	0.92	0.82	11	1.51	1.79	17	1.45	1.33	9	1.13	0.89	24	1.28	1.23	4
Nickel	µg/g	0.4	32.6	30.8	6	17.1	16.5	4	23.8	27.8	16	28.6	26.1	9	26.7	25.2	6	28.3	30.9	9
Selenium	µg/g	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	0.51	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
Silver	mg/kg	0.2	<0.2	<0.2	-	<0.2	<0.2	-	0.22	0.21	-	0.23	0.21	-	<0.2	<0.2	-	<0.2	<0.2	-
Strontium	µg/g	0.2	39.6	40.5	2	45.5	45.3	0	28.9	29.2	1	32.6	30.9	5	34.6	53.1	42	64.9	44.1	38
Thallium	µg/g	0.1	0.16	0.14	-	<0.1	<0.1	-	0.13	0.15	-	0.18	0.16	-	0.16	0.18	-	0.16	0.15	-
Tin	µg/g	0.2	1.45	1.31	10	0.5	0.49	-	0.91	1.24	-	1.18	1.13	4	0.49	0.53	-	0.35	0.36	-
Uranium	µg/g	0.05	0.828	0.673	21	0.913	0.856	6	0.758	0.887	16	1.23	0.726	52	0.552	0.572	4	0.764	0.778	2
Vanadium	µg/g	1	57.5	51.8	10	43.1	43.9	2	47.2	45.7	3	45.8	45.9	0	47.4	46.7	1	49.3	50.7	3
Zinc	µg/g	2	75.6	75.6	0	80.1	67.3	17	59.5	66	10	61.8	60.6	2	53.4	52	3	58.4	62.2	6
Hydrocarbons																				
F2 (C10-C16)	µg/g	100	<100	<100	-	<100	<100	-	<100	<100	-	-	-	-	<100	<100	-	<100	<100	-
F2-NAPHTHALENE	µg/g	100	<100	<100	-	<100	<100	-	<100	<100	-	-	-	-	<100	<100	-	<100	<100	-
F3 (C16-C34)	µg/g	200	<200	<200	-	<200	<200	-	<200	<200	-	-	-	-	<200	<200	-	<200	<200	-
F3-PAH	µg/g	200	<200	<200	-	<200	<200	-	<200	<200	-	-	-	-	<200	<200	-	<200	<200	-
F4 (C34-C50)	µg/g	200	<200	<200	-	<200	<200	-	<200	<200	-	-	-	-	<200	<200	-	<200	<200	-
Polycyclic Aromatic Hydrocarbons (PAHs)																				
B(a)P Total Potency Equivalent	µg/g	0.01	0.0986	0.135	31	<0.01	<0.01	-	0.154	0.181	16				0.0314	<0.01	-	<0.01	<0.01	-
IACR (CCME)	µg/g	0.0625	1.86	2.16	15	<0.0625	<0.0625	-	2.44	3.26	29				0.139	<0.0625	-	<0.0625	<0.0625	-
2-methylnaphthalene	µg/g	0.01	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	0.01	-	<0.01	<0.01	-
Acenaphthene	µg/g	0.005	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	0.007	-	<0.005	<0.005	-
Acenaphthylene	µg/g	0.005	0.013	0.014	-	<0.005	<0.005	-	0.027	0.028	4	0.021	0.024	-	<0.005	<0.005	-	<0.005	<0.005	-
Anthracene	µg/g	0.004	0.039	0.04	3	<0.004	<0.004	-	0.079	0.072	9	0.075	0.085	13	0.005	0.004	-	<0.004	<0.004	-
Benz(a)anthracene	µg/g	0.01	0.033	0.036	-	<0.01	<0.01	-	0.024	0.026	-	0.072	0.08	11	<0.01	<0.01	-	<0.01	<0.01	-
Benzo(a)pyrene	µg/g	0.01	0.052	0.079	41	<0.01	<0.01	-	0.069	0.087	23	0.094	0.101	7	<0.01	<0.01	-	<0.01	<0.01	-
Benzo(b)fluoranthene	µg/g	0.01	0.131	0.146	11	<0.01	<0.01	-	0.214	0.237	10	0.22	0.215	2	<0.01	<0.01	-	<0.01	<0.01	-
Benzo(g,h,i)perylene	µg/g	0.02	0.129	0.151	16	<0.02	<0.02	-	0.504	0.427	17	0.263	0.295	11	0.038	<0.02	-	<0.02	<0.02	-
Benzo(k)fluoranthene	µg/g	0.01	0.053	0.063	17	<0.01	<0.01	-	0.086	0.094	9	0.094	0.092	2	<0.01	<0.01	-	<0.01	<0.01	-
Chrysene	µg/g	0.01	0.071	0.065	9	<0.01	<0.01	-	0.084	0.077	9	0.129	0.123	5	<0.01	<0.01	-	<0.01	<0.01	-
Dibenz(a,h)anthracene	µg/g	0.005	0.012	0.015	-	<0.005	<0.005	-	0.028	0.026	7	0.02	0.019	-	0.028	<0.005	-	<0.005	<0.005	-
Fluoranthene	µg/g	0.01	0.064	0.049	-	<0.01	<0.01	-	0.105	0.084	22	0.14	0.101	32	<0.01	<0.01	-	<0.01	<0.01	-
Fluorene	µg/g	0.01	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-
Indeno(1,2,3-c,d)pyrene	µg/g	0.02	0.062	0.083	-	<0.02	<0.02	-	0.186	0.171	8	0.118	0.117	1	0.028	<0.02	-	<0.02	<0.02	-
Naphthalene	µg/g	0.01	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-
Phenanthrene	µg/g	0.02	<0.02	<0.02	-	<0.02	<0.02	-	0.027	0.02	-	0.026	0.022	-	<0.02	<0.02	-	<0.02	<0.02	-
Pyrene	µg/g	0.02	0.067	0.055	-	<0.02	<0.02	-	0.099	0.085	-	0.149	0.149	0	<0.02	<0.02	-	<0.02	<0.02	-
Laboratory Sample ID			7052353	7052353		7052353	7052353		7052560	7052560		7052560	7052560		7060116	7060116		7060116	7060116	

NOTES:

-	Not analyzed or RPD not calculated.
<	Concentration is less than the laboratory detection limit indicated.
RDL	Laboratory Reportable Detection Limit
RPD	RPD is Relative Percentage Difference calculated as RPD=[C2-C1]/[(C1+C2)/2] where C1,C2 = concentrations of parameters in 1st and 2nd sample respectively.
	RPDs have only been considered where a concentration is greater than 5 times the RDL
BOLD	High RPDs are in bold (acceptable RPD is 45% for metals in soil [60% for high variability metals] 75% for PAHs in soil, and 60% for EPH and other organics in soil as recommended by BC Ministry of Environment Q&A, and BC Environmental Laboratory Manual).
	High variability metals include: Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, and Ti

Table 3: Leachable Copper in Soil

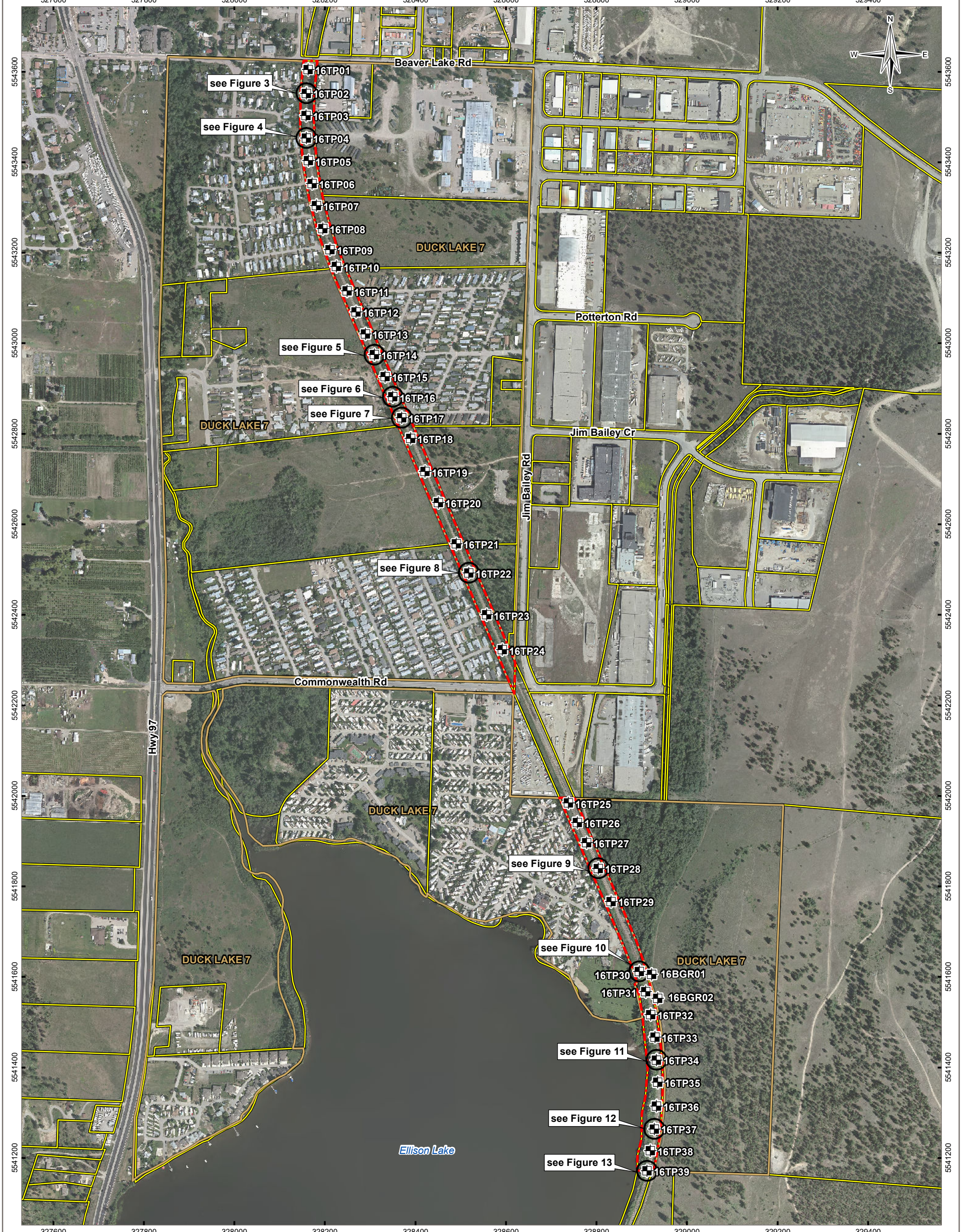
Parameter	Unit	CDWG	FIGQG AW	16TP14E1 SA#1	16TP34E1 SA#1	16TP39N1 SA#1
				0.15 m	0.15 m	0.15 m
				5/29/2017	5/29/2017	5/29/2017
Leachate Metals						
Copper	µg/L	1000	2	<0.10	<0.10	<0.10
Laboratory Identification Number				7052560-13	7060116-53	7060116-89

NOTES:

Leachable copper concentration measured by synthetic precipitation leaching procedure

<	Concentration is less than the laboratory detection limit indicated.
CDWG	Canadian Drinking Water Guideline is an aesthetic objective only
FIGQG	Federal Interim Groundwater Quality Guidelines (June 16, Verision 4) for protection of aquatic life for residential, commercial, and industrial land uses.

W:\Projects\VAN\69720\VENW03093-01\GIS\Maps\VENW03093-01_Figure02_TestpitPlan.mxd modified 12/20/2017 by stephanie.leusink



LEGEND

- Testpit
- CN Rail Study Area
- Parcel Boundary
- IR Boundary

NOTES
Base data source:
Indian Reserve Administrative Boundaries provided by DataBC.
Parcel boundaries and 2015 imagery provided by the City of Kelowna.

STATUS
ISSUED FOR USE

PHASE III ESA - CN RAIL ROW MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5 DUCK LAKE IR 7

Testpit Plan

PROJECTION	DATUM	CLIENT
UTM Zone 11	NAD83	Okanagan Indian Band and Indigenous and Northern Affairs Canada

Scale: 1:8,000
100 50 0 100
Metres

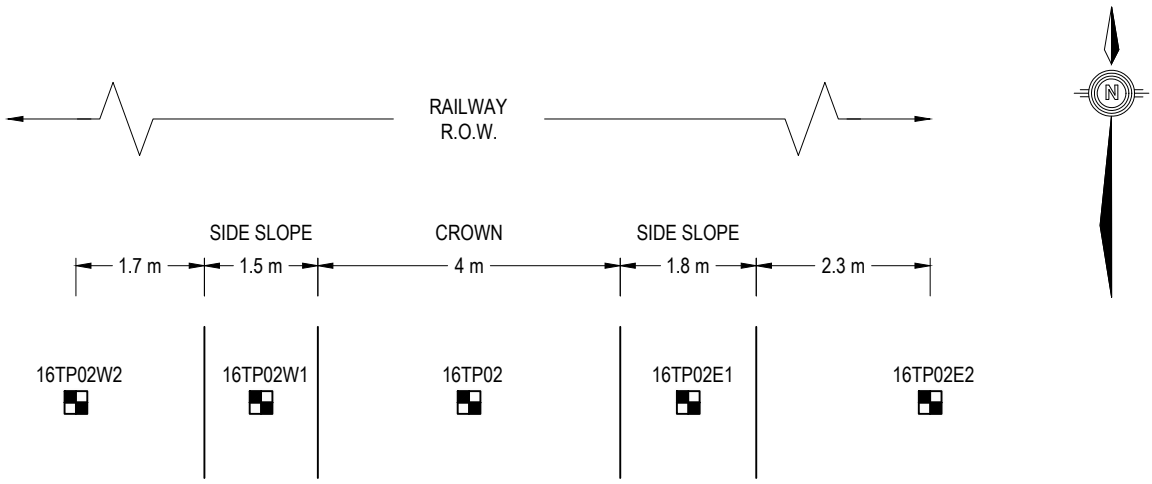
FILE NO.
VENW03093-01_Figure02_TestpitPlan.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-VANC	SL	MEZ	CC	0

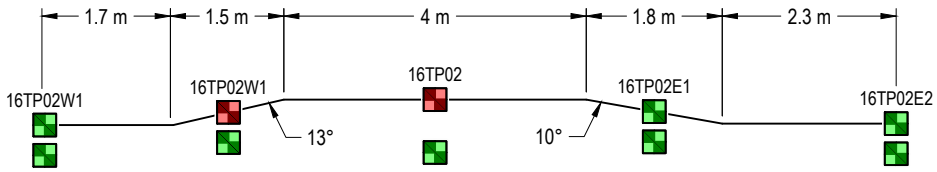
DATE	PROJECT NO.
December 20, 2017	ENW.VENW03093-01

TETRA TECH

Figure 2



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND
- Soil sample locations
- PAH concentrations in soil exceeds CCME Residential, Park and Commercial Guidelines
- PAH concentrations in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

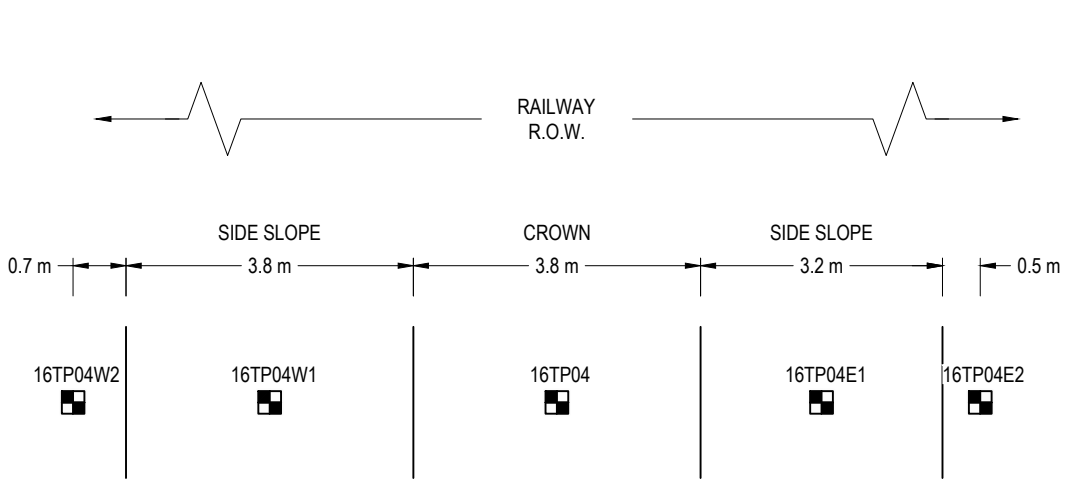
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

PAH CONCENTRATIONS IN SOIL
16TP02

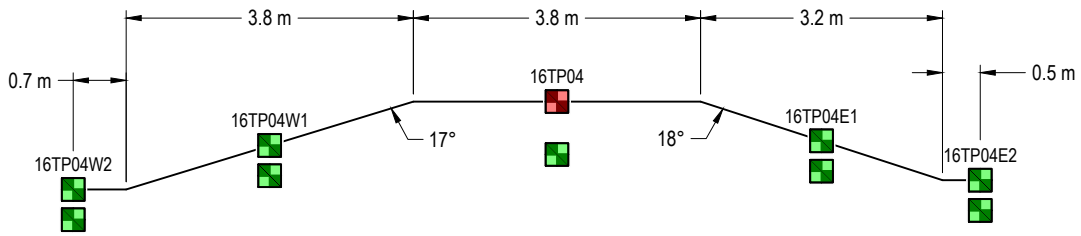
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 3



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND
- Soil sample locations
- PAH concentrations in soil exceeds CCME Residential, Park and Commercial Guidelines
- PAH concentrations in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

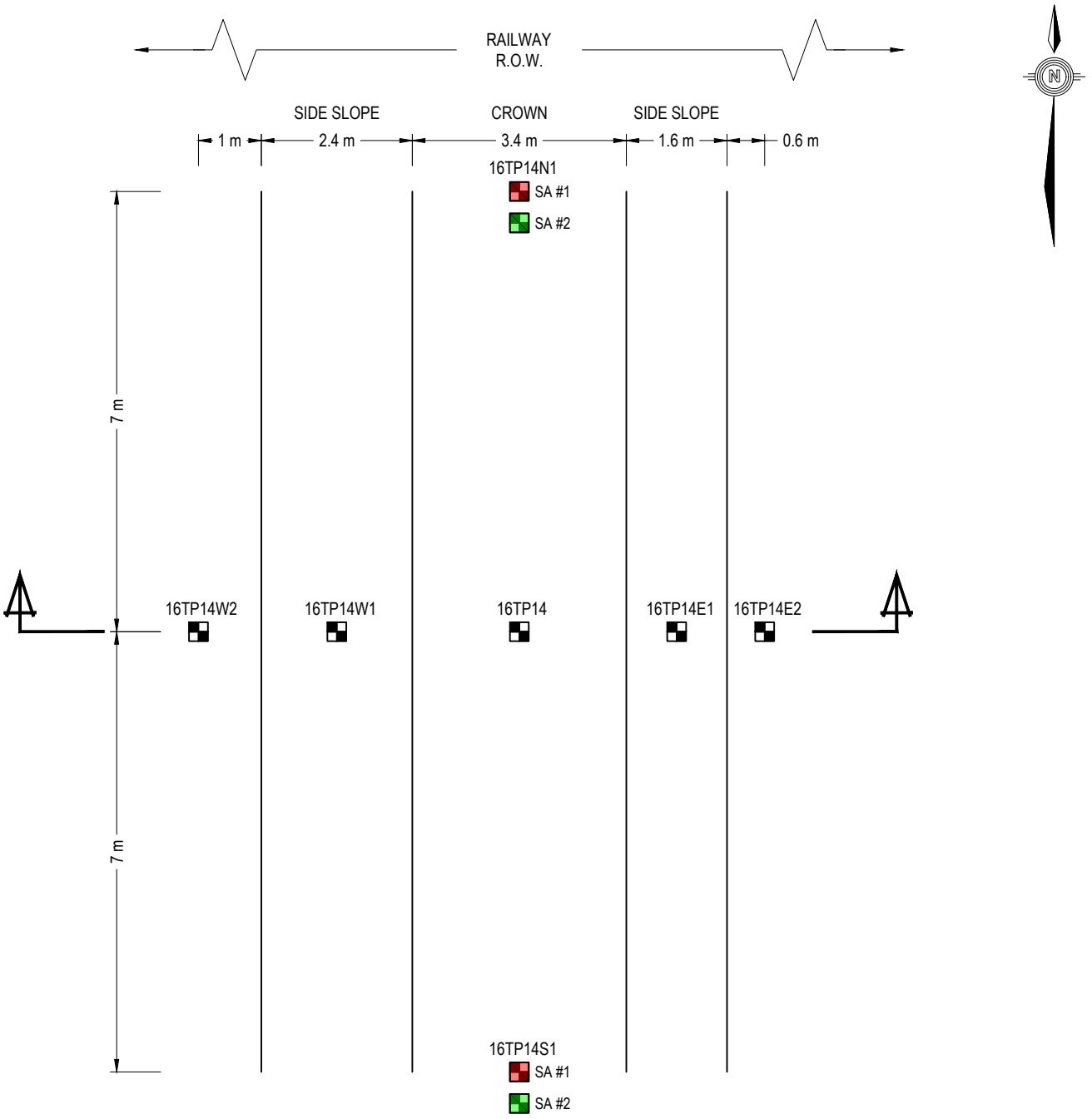
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

PAH CONCENTRATIONS IN SOIL
16TP04

PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 4



ISSUED FOR USE

LEGEND

- Soil sample locations
- PAH concentrations in soil exceeds CCME Residential, Park and Commercial Guidelines
- PAH concentrations in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

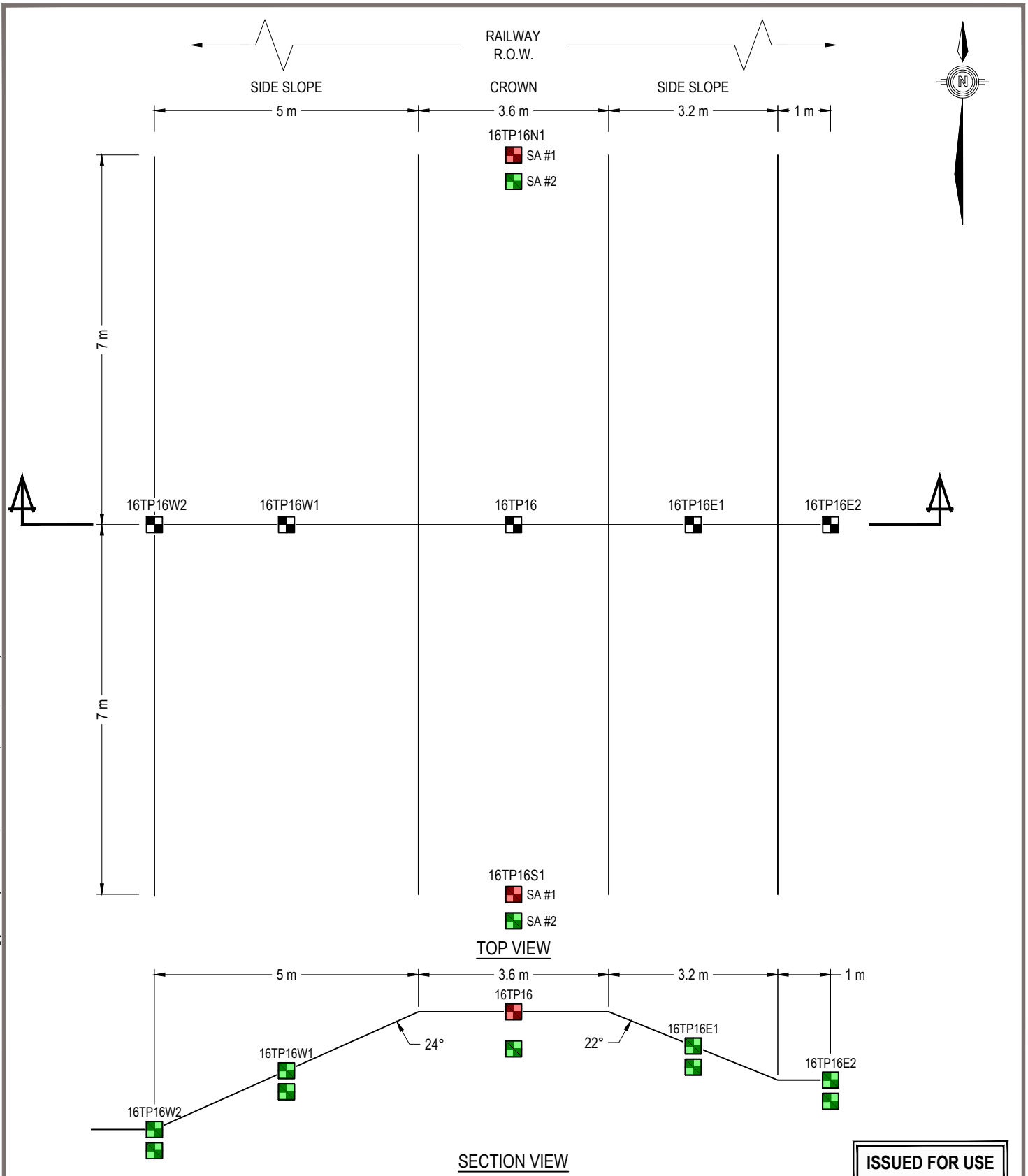
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

PAH CONCENTRATIONS IN SOIL 16TP14

PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 5



ISSUED FOR USE

LEGEND

- Soil sample locations
- PAH concentrations in soil exceeds CCME Residential, Park and Commercial Guidelines
- PAH concentrations in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

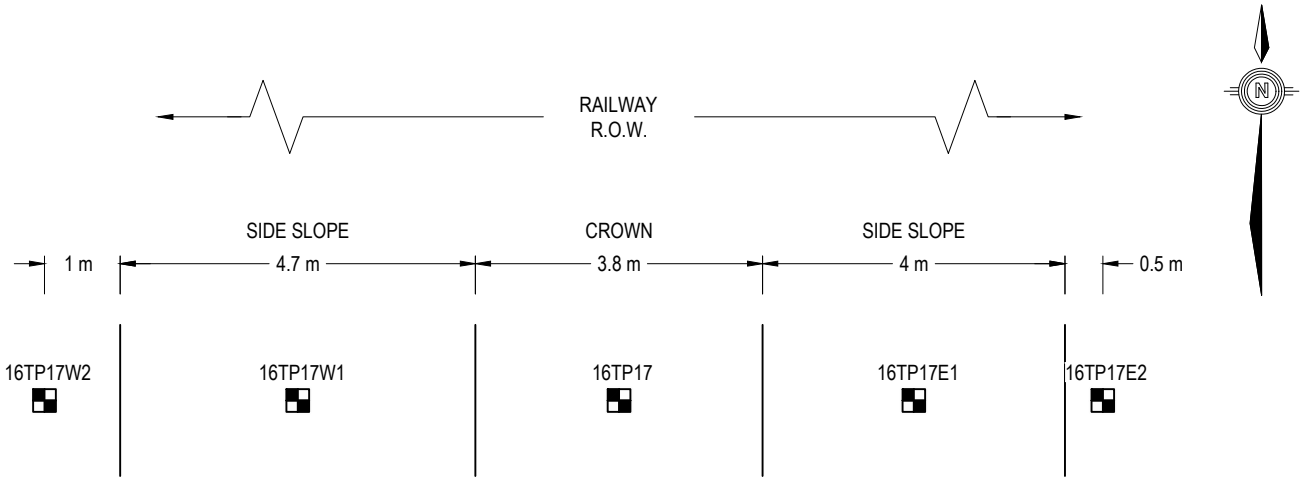
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

PAH CONCENTRATIONS IN SOIL 16TP16

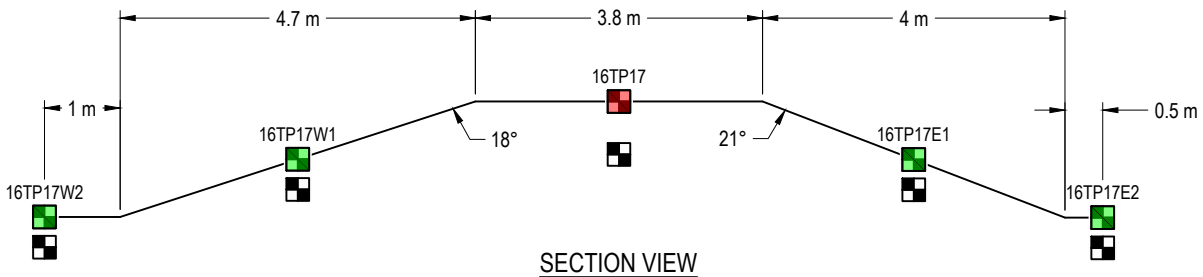
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 6



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND
- Soil sample locations
- PAH concentrations in soil exceeds CCME Residential, Park and Commercial Guidelines
- PAH concentrations in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100
1 0 1 2 4m

HORIZONTAL SCALE 1:100
1 0 1 2 4m

CLIENT
OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

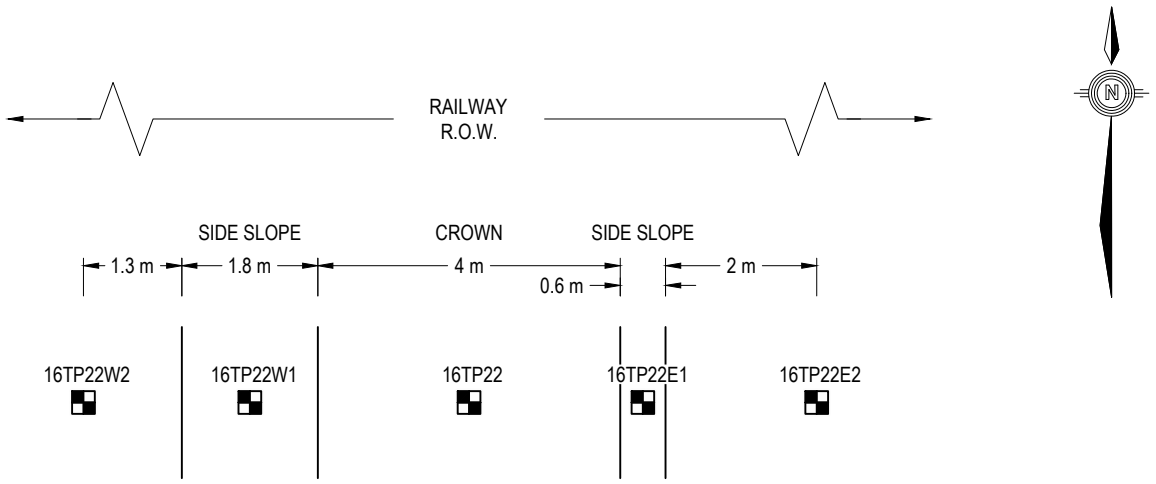
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

PAH CONCENTRATIONS IN SOIL
16TP17

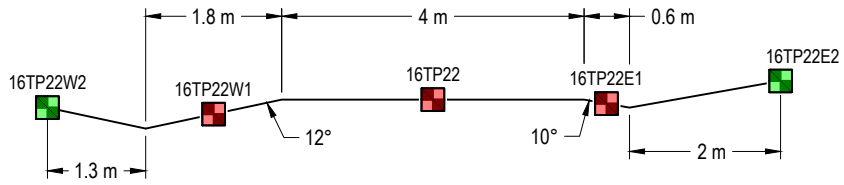
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 7



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND
- Soil sample locations
- PAH concentrations in soil exceeds CCME Residential, Park and Commercial Guidelines
- PAH concentrations in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100
1 0 1 2 4m

HORIZONTAL SCALE 1:100
1 0 1 2 4m

CLIENT
OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

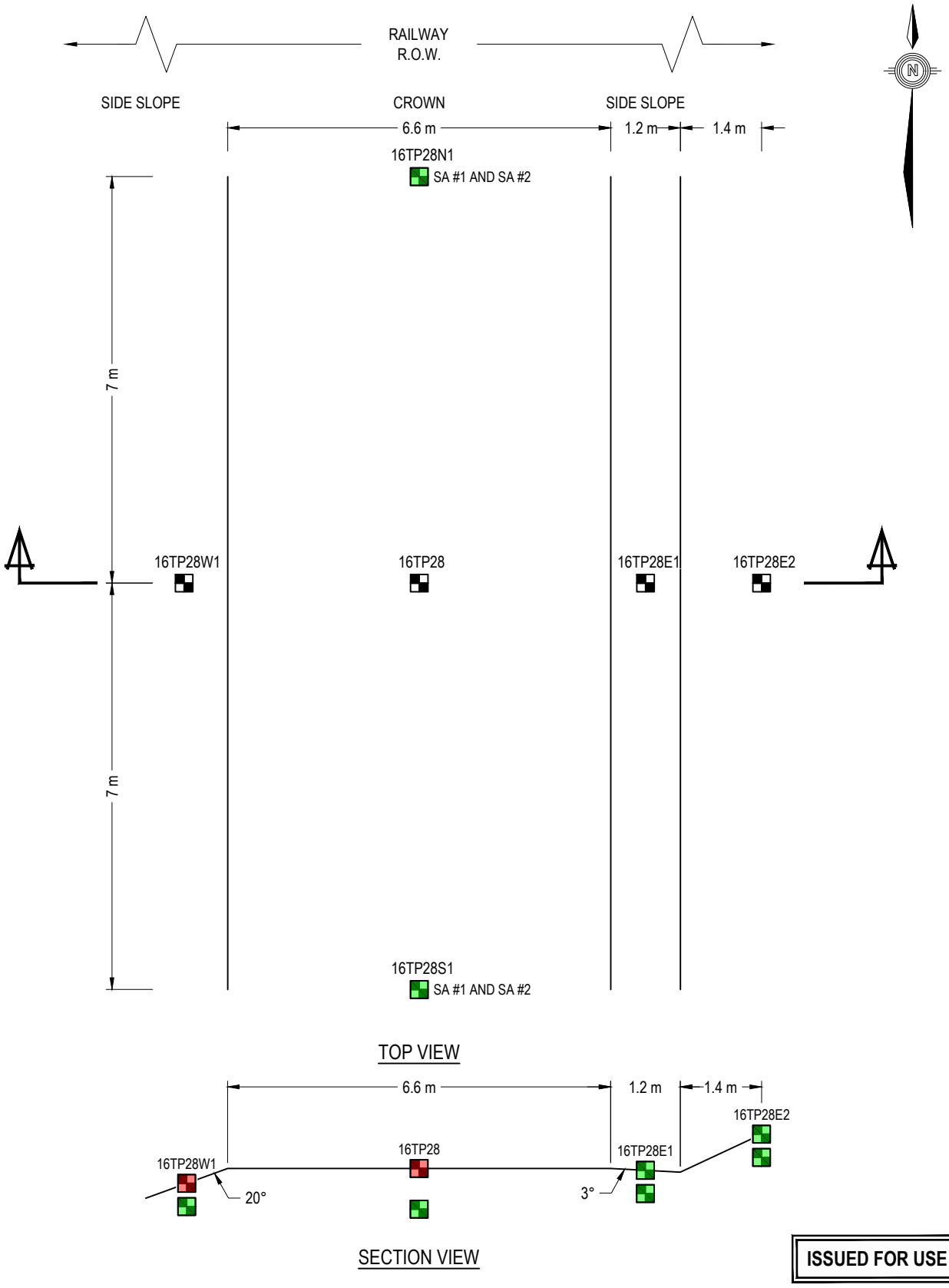
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

PAH CONCENTRATIONS IN SOIL
16TP22

PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 8



ISSUED FOR USE

LEGEND

- Soil sample locations
- PAH concentrations in soil exceeds CCME Residential, Park and Commercial Guidelines
- PAH concentrations in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

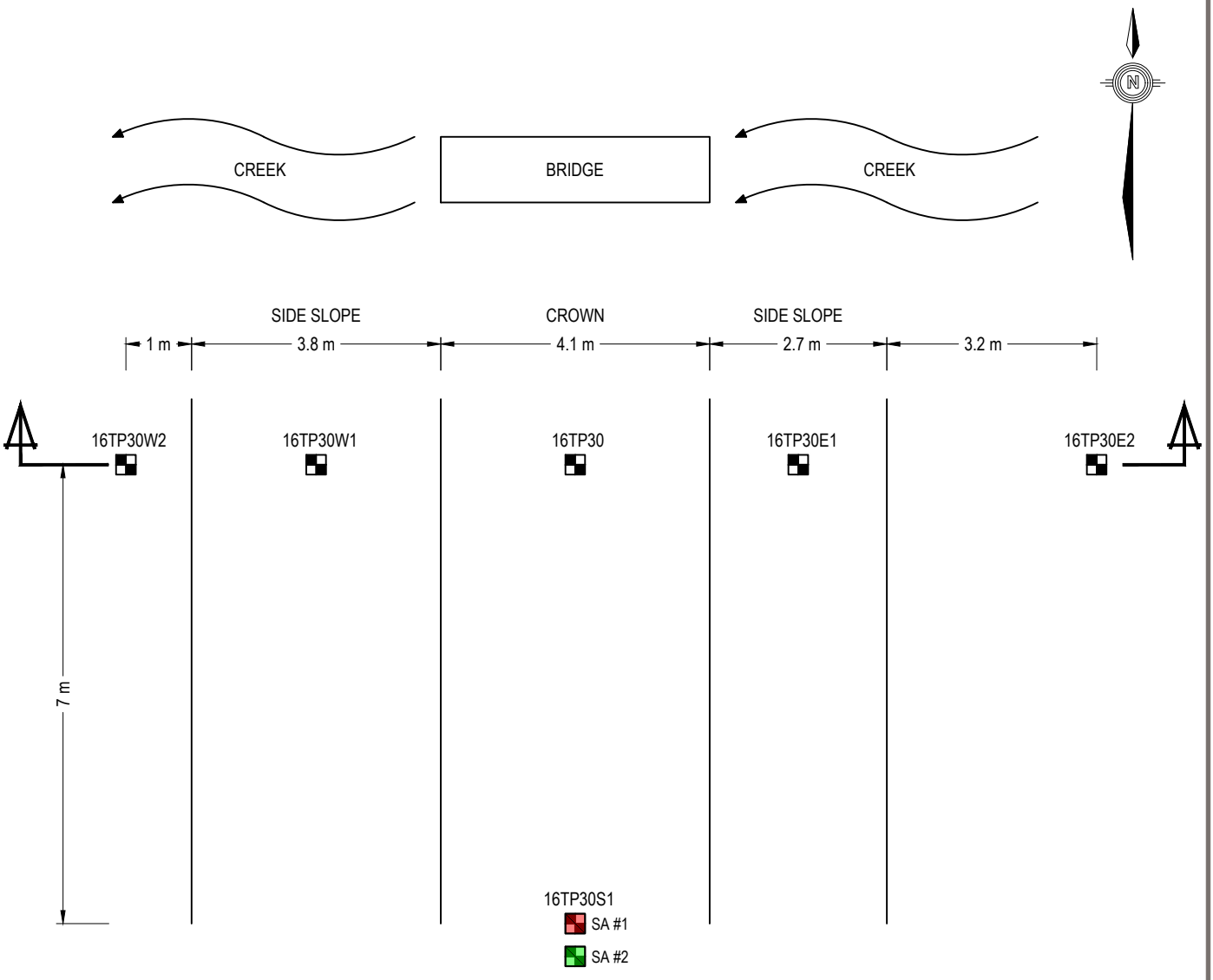
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

PAH CONCENTRATIONS IN SOIL
16TP28

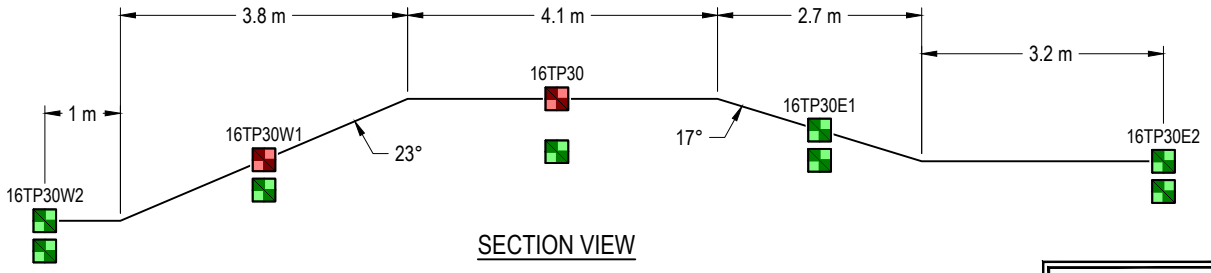
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 9



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND

- Soil sample locations
- PAH concentrations in soil exceeds CCME Residential, Park and Commercial Guidelines
- PAH concentrations in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

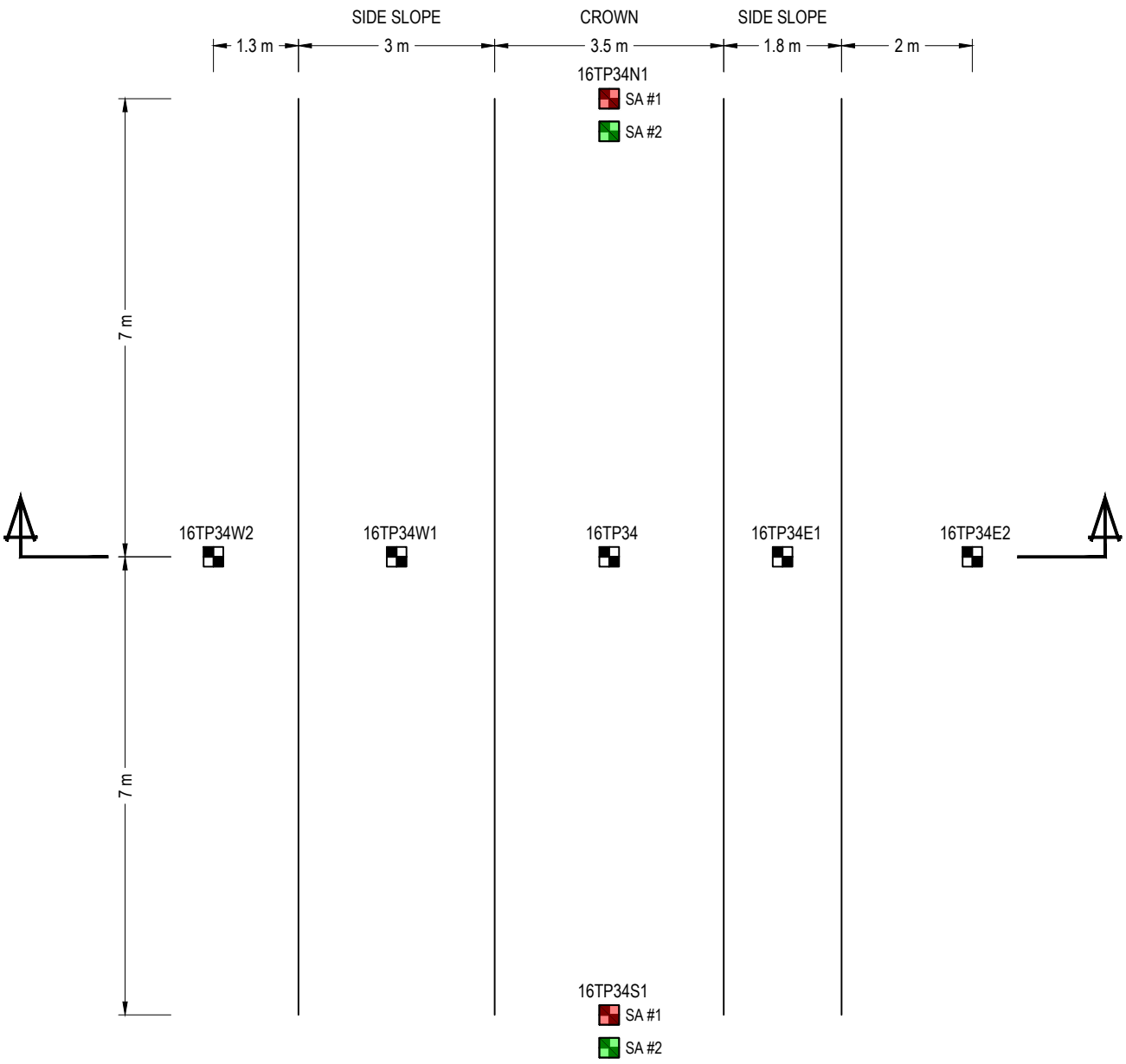
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

PAH CONCENTRATIONS IN SOIL
16TP30

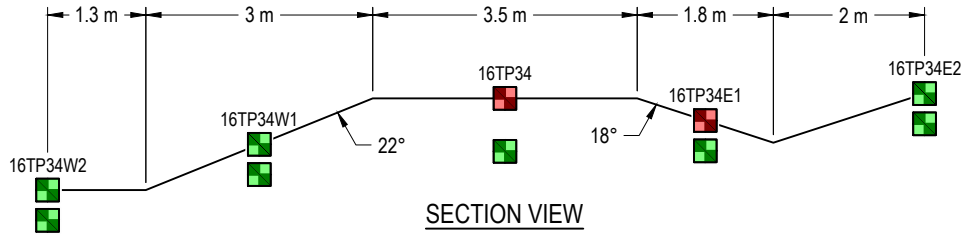
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 10



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND

- Soil sample locations
- PAH concentrations in soil exceeds CCME Residential, Park and Commercial Guidelines
- PAH concentrations in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

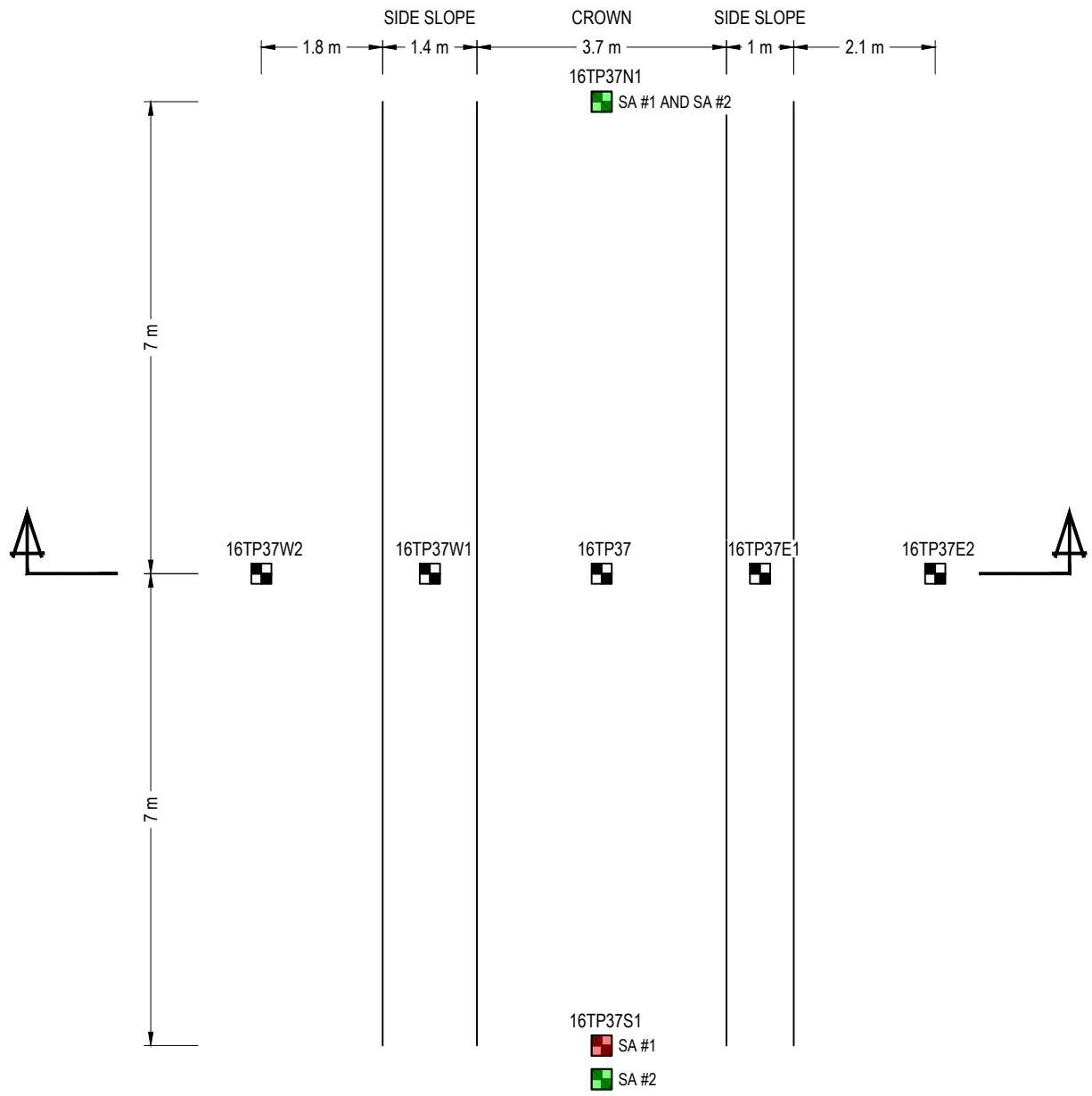
PAH CONCENTRATIONS IN SOIL
16TP34

TETRA TECH

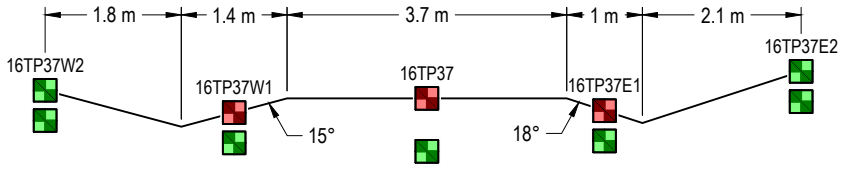
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 11



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND

- Soil sample locations
- PAH concentrations in soil exceeds CCME Residential, Park and Commercial Guidelines
- PAH concentrations in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

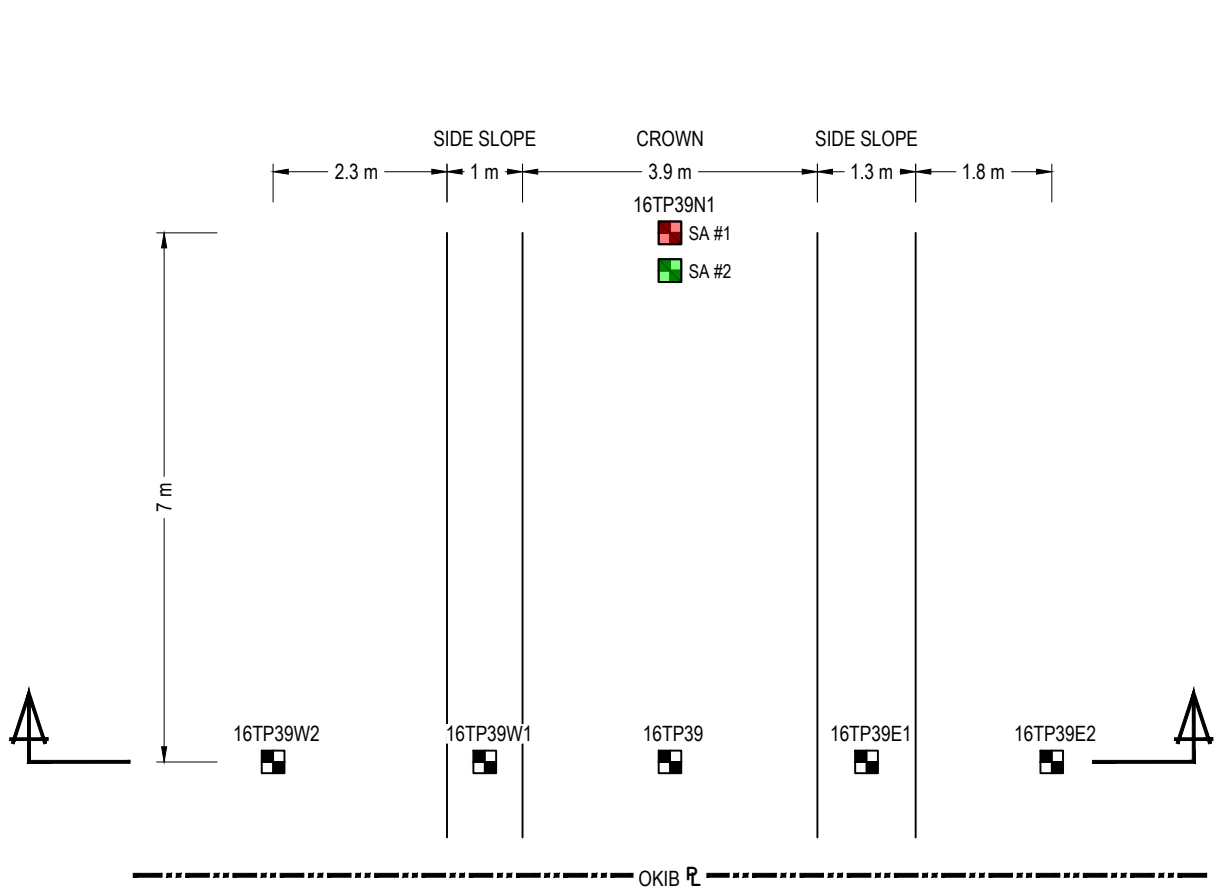
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

PAH CONCENTRATIONS IN SOIL 16TP37

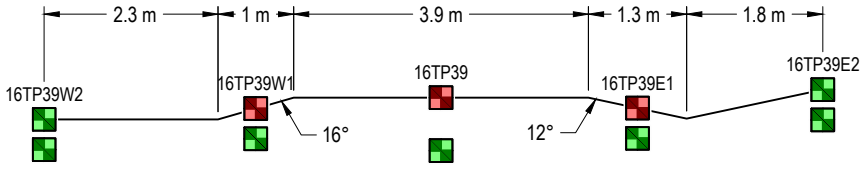
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 12



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND

- Soil sample locations
- PAH concentrations in soil exceeds CCME Residential, Park and Commercial Guidelines
- PAH concentrations in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

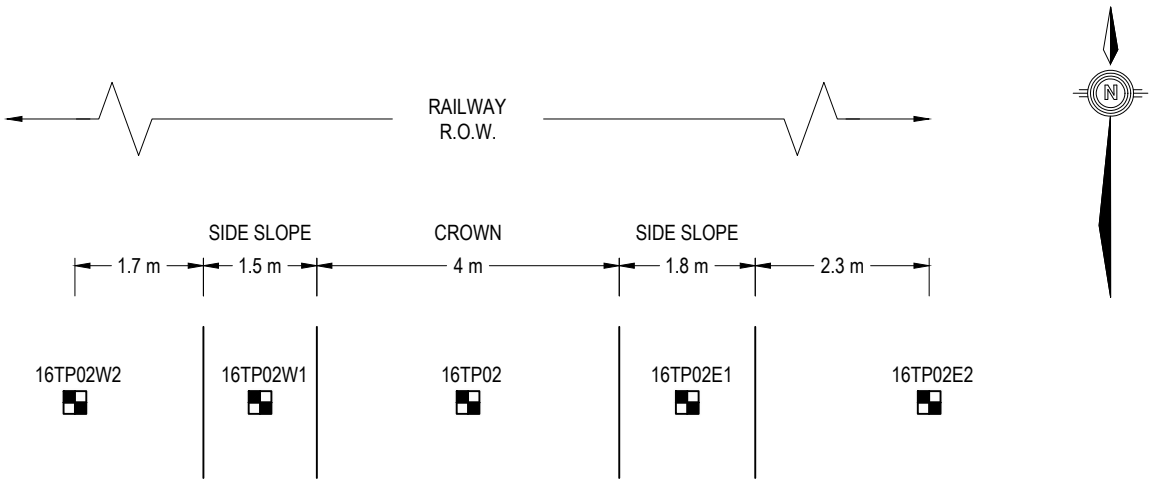
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

PAH CONCENTRATIONS IN SOIL
16TP39

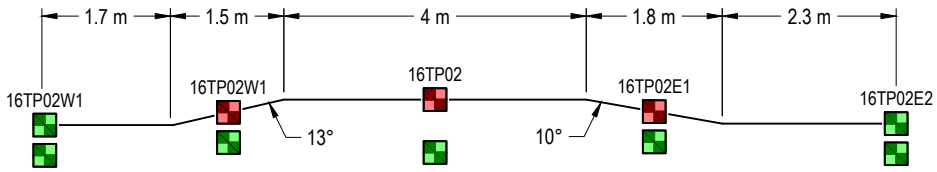
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 13



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND
- Soil sample locations
- Copper concentration in soil exceeds CCME Residential, Park and Commercial Guidelines
- Copper concentration in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

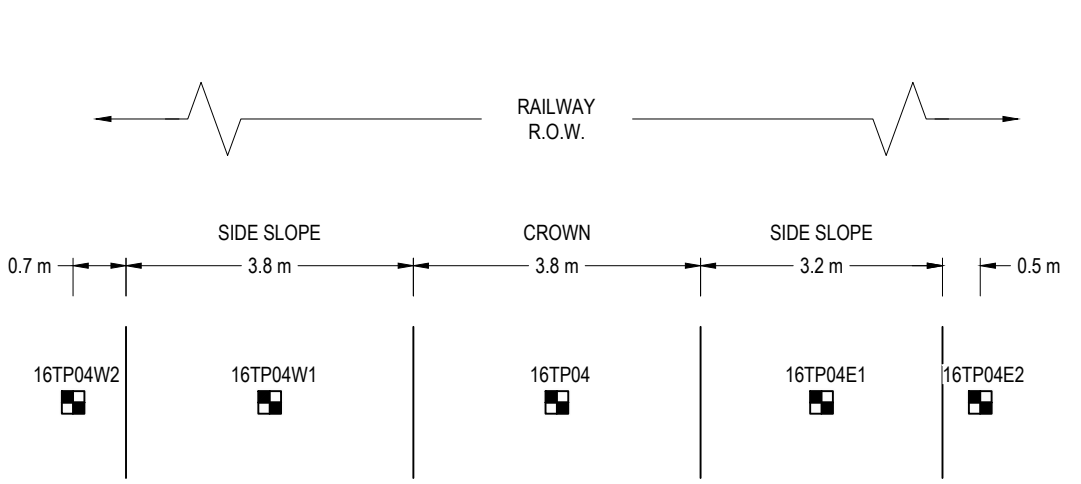
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

COPPER CONCENTRATION IN SOIL
16TP02

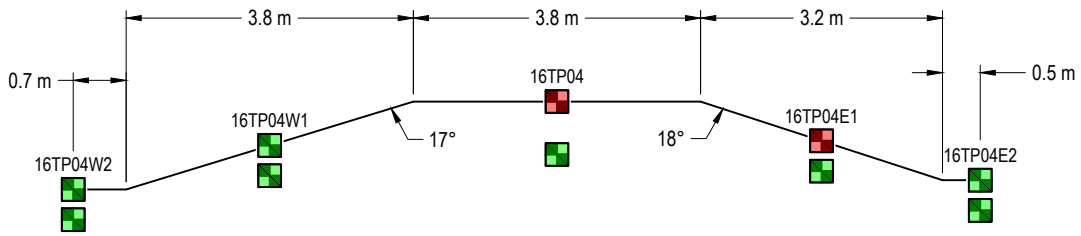
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 14



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND
- Soil sample locations
- Copper concentration in soil exceeds CCME Residential, Park and Commercial Guidelines
- Copper concentration in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100
1 0 1 2 4m

HORIZONTAL SCALE 1:100
1 0 1 2 4m

CLIENT
OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

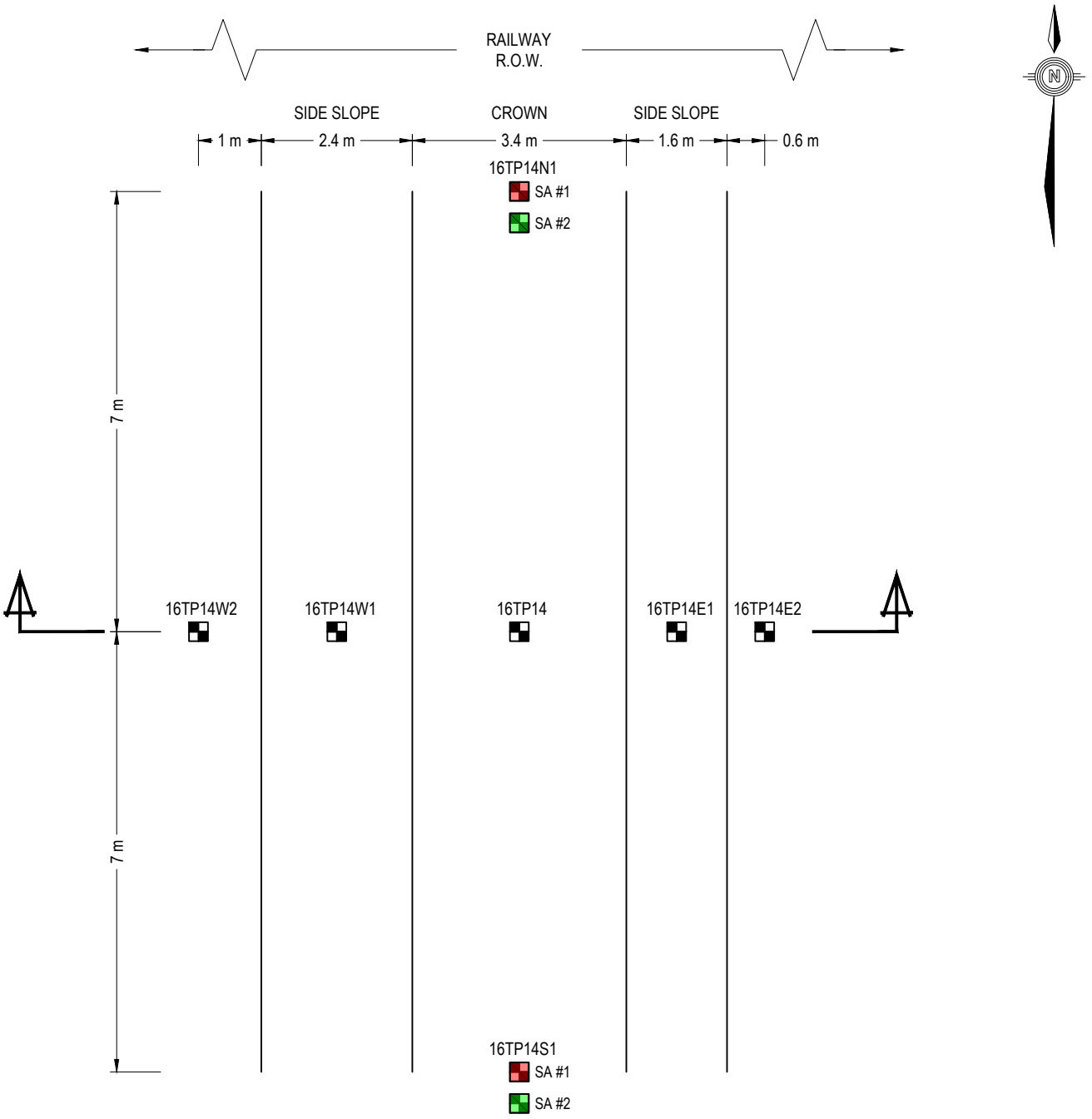
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

COPPER CONCENTRATION IN SOIL
16TP04

PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 15



ISSUED FOR USE

LEGEND

- Soil sample locations
- Copper concentration in soil exceeds CCME Residential, Park and Commercial Guidelines
- Copper concentration in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

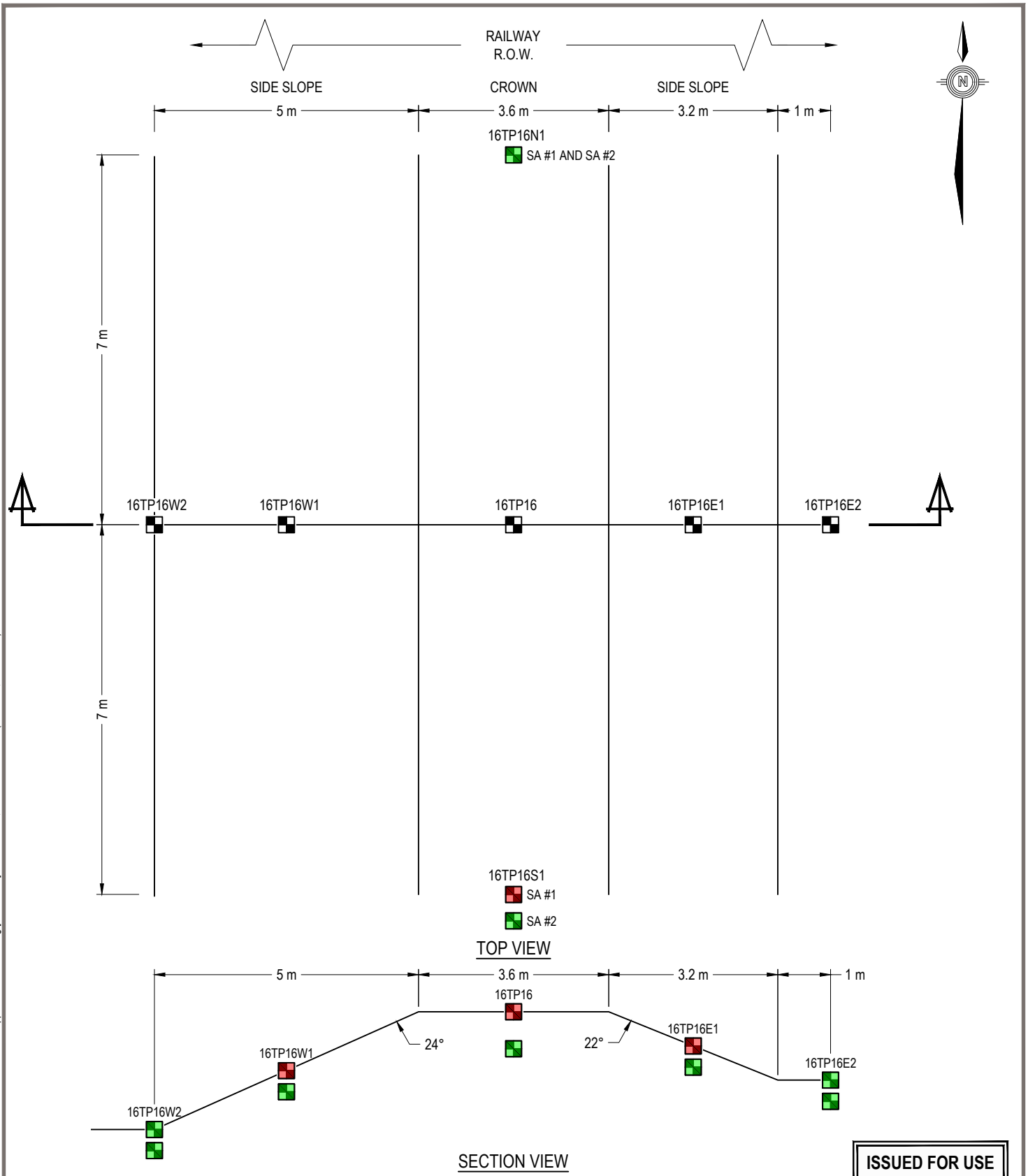
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

COPPER CONCENTRATION IN SOIL
16TP14

PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 16



ISSUED FOR USE

LEGEND

- Soil sample locations
- Copper concentration in soil exceeds CCME Residential, Park and Commercial Guidelines
- Copper concentration in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

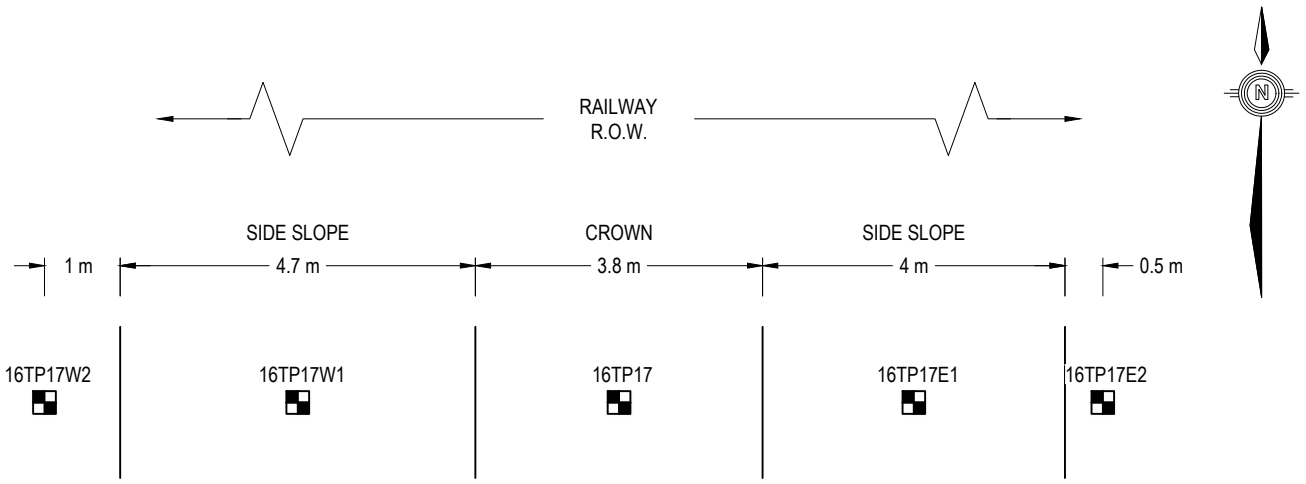
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

COPPER CONCENTRATION IN SOIL
16TP16

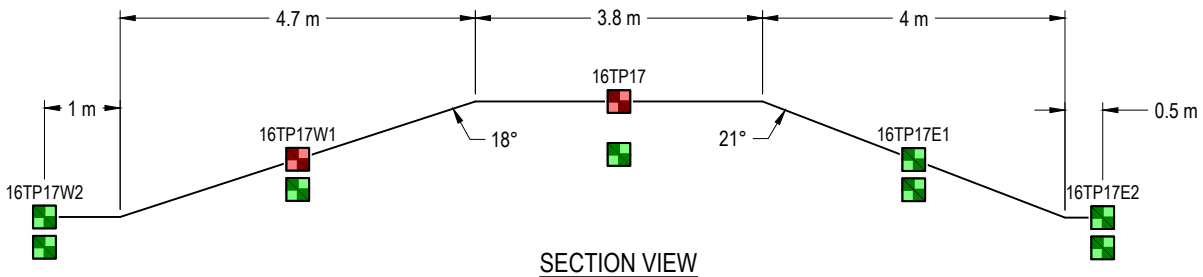
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 17



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND
- Soil sample locations
- Copper concentration in soil exceeds CCME Residential, Park and Commercial Guidelines
- Copper concentration in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

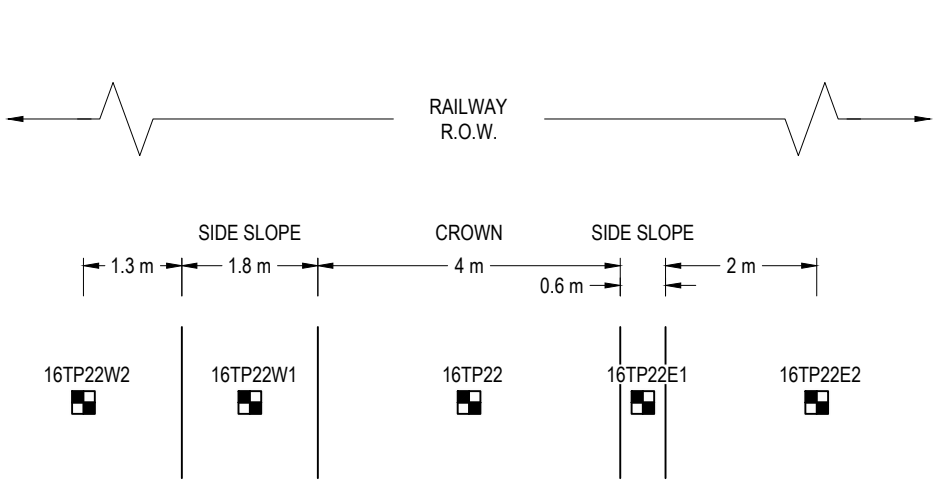
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

COPPER CONCENTRATION IN SOIL
16TP17

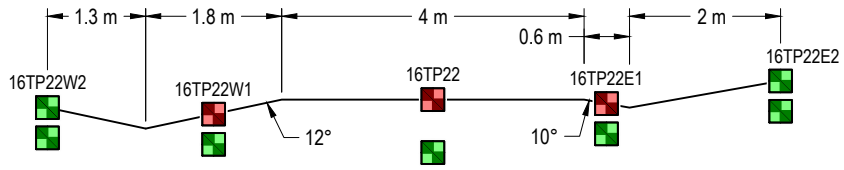
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 18



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND
- Soil sample locations
- Copper concentration in soil exceeds CCME Residential, Park and Commercial Guidelines
- Copper concentration in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

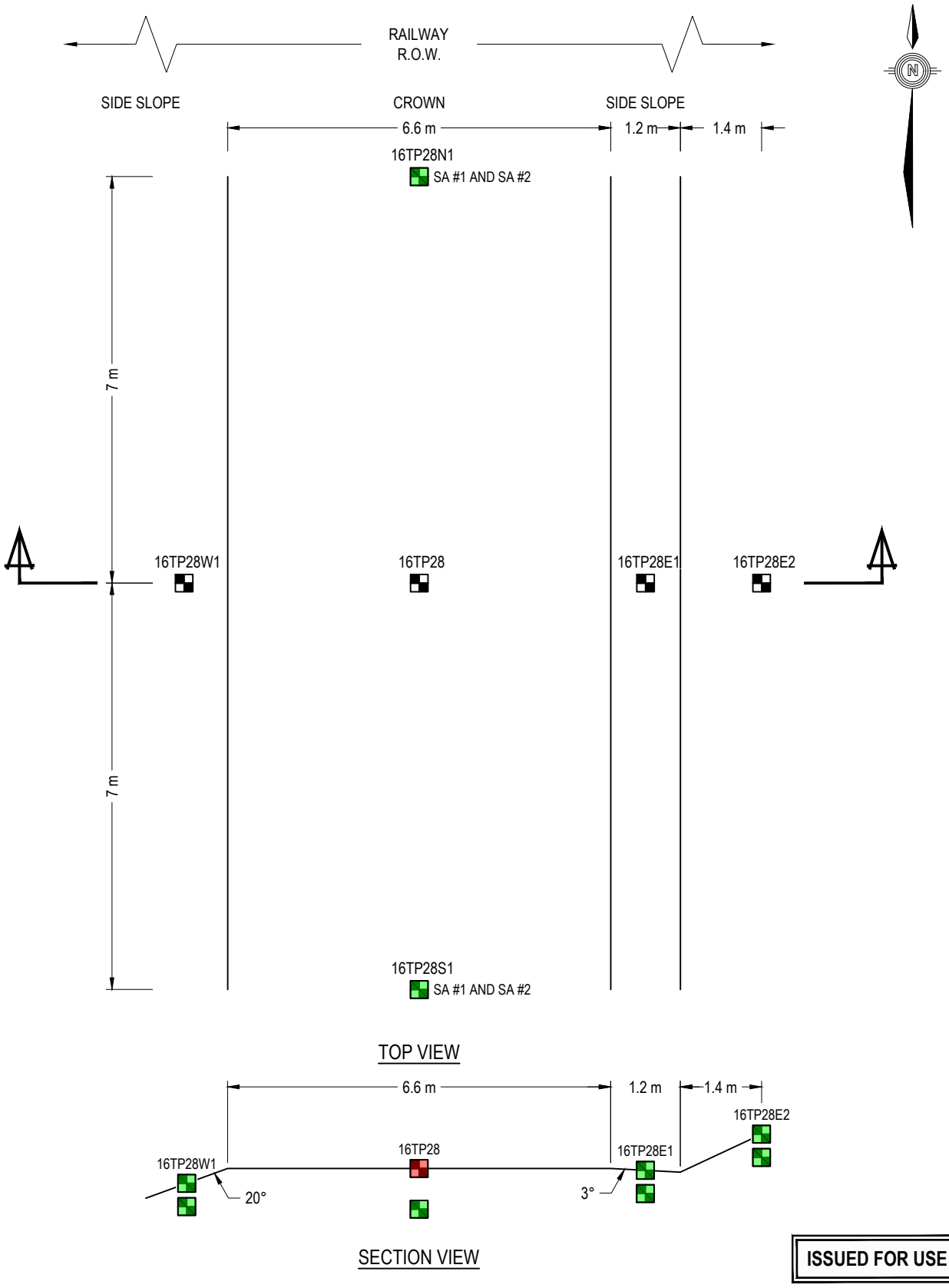
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

COPPER CONCENTRATION IN SOIL
16TP22

PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 19



ISSUED FOR USE

LEGEND

- Soil sample locations
- Copper concentration in soil exceeds CCME Residential, Park and Commercial Guidelines
- Copper concentration in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

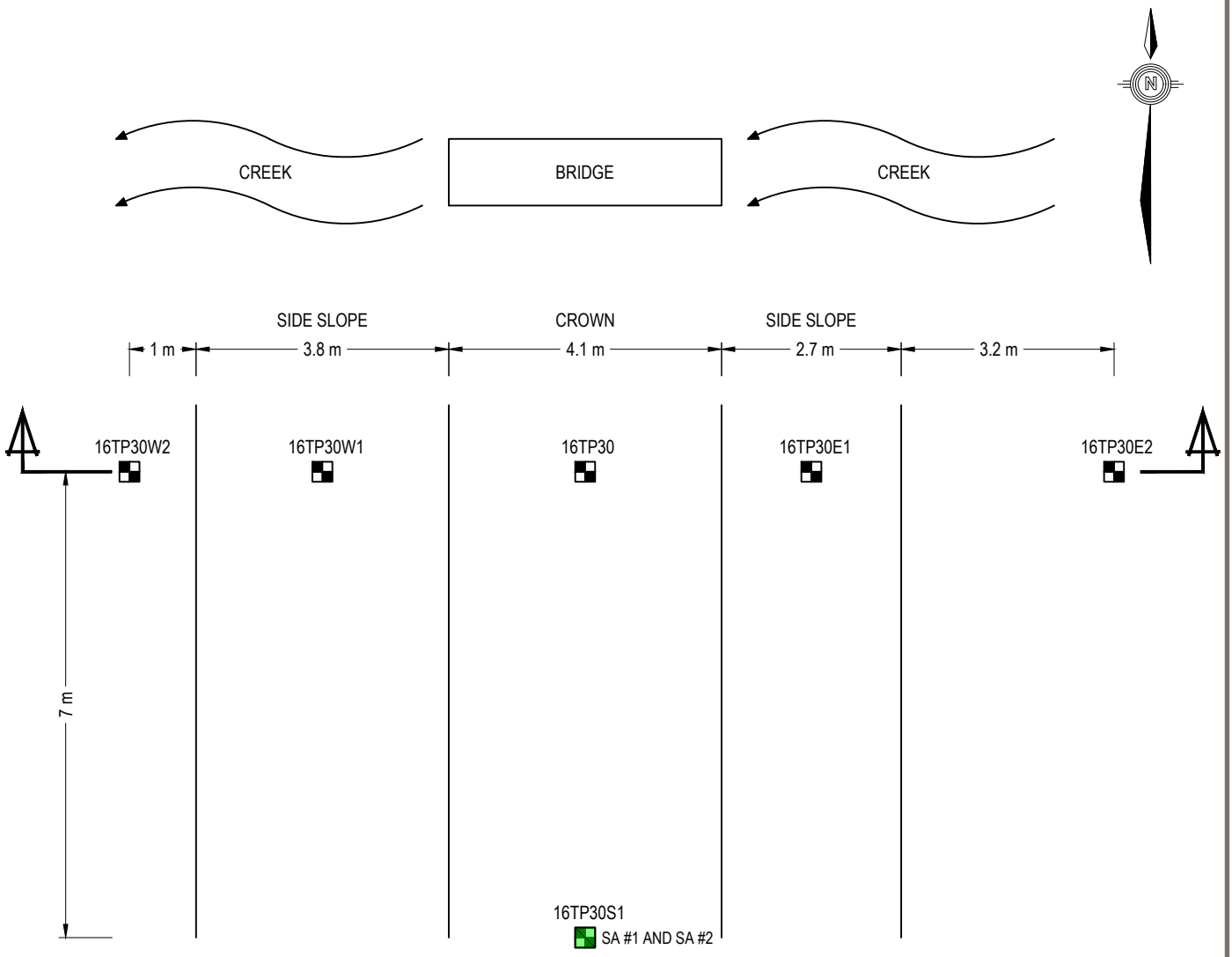
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

COPPER CONCENTRATION IN SOIL 16TP28

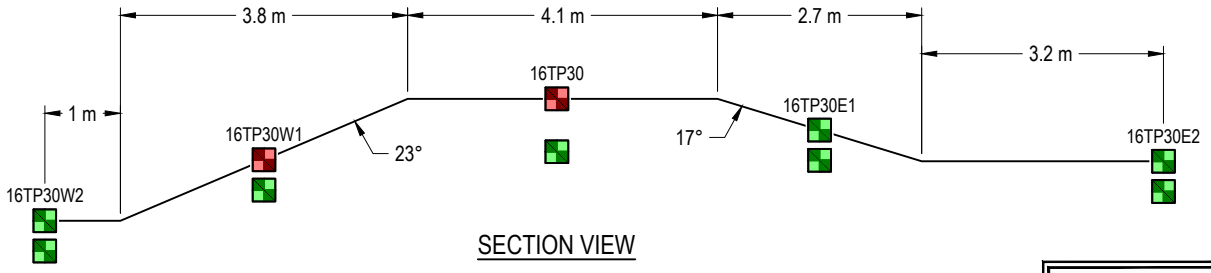
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 20



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND

- Soil sample locations
- Copper concentration in soil exceeds CCME Residential, Park and Commercial Guidelines
- Copper concentration in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

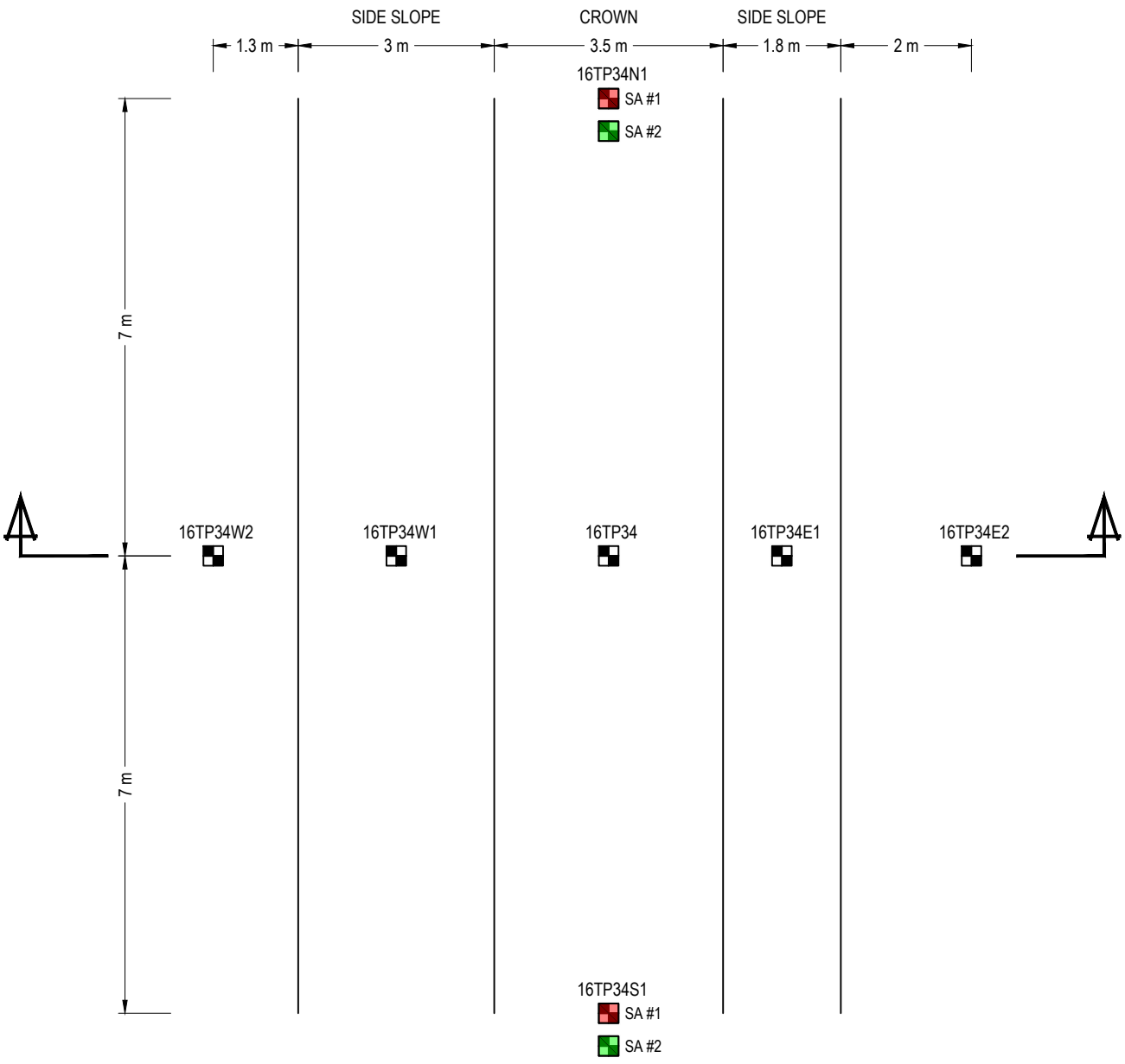
PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

COPPER CONCENTRATION IN SOIL
16TP30

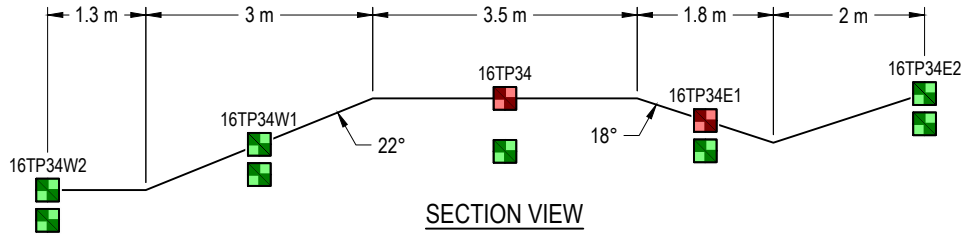
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 21



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND

- Soil sample locations
- Copper concentration in soil exceeds CCME Residential, Park and Commercial Guidelines
- Copper concentration in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

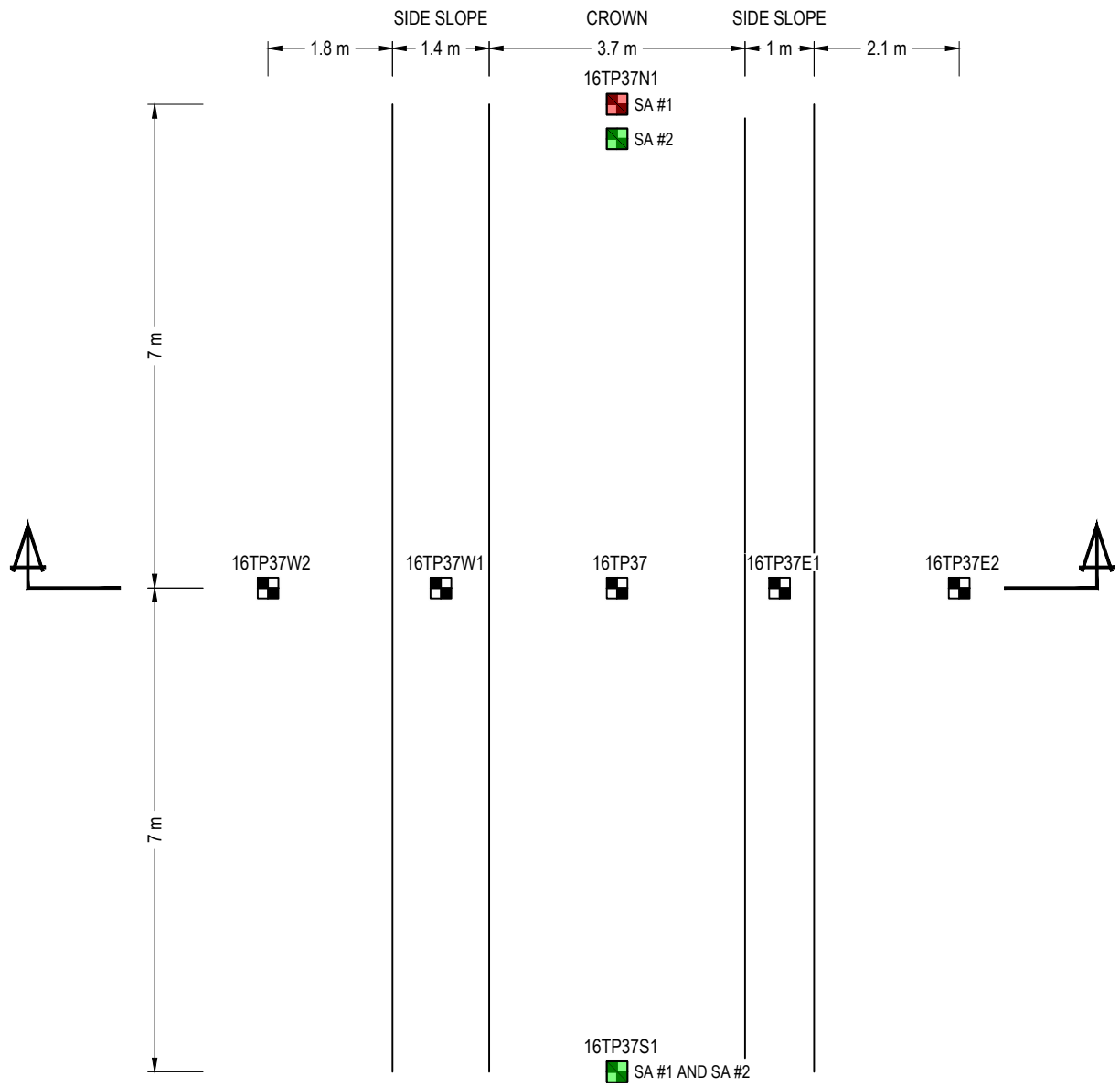
COPPER CONCENTRATION IN SOIL
16TP34

TETRA TECH

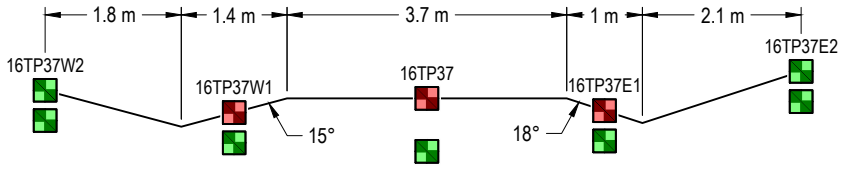
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 22



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND

- Soil sample locations
- Copper concentration in soil exceeds CCME Residential, Park and Commercial Guidelines
- Copper concentration in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

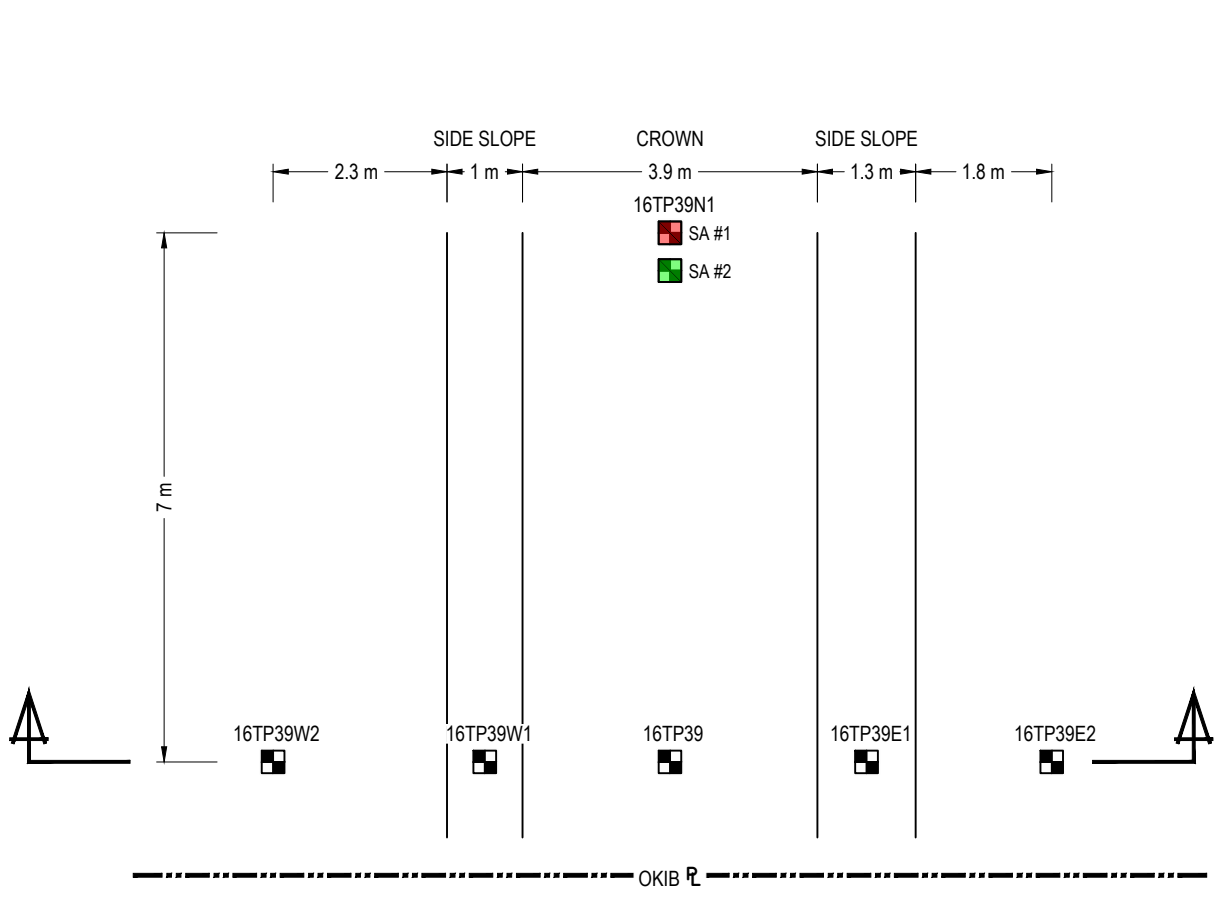
COPPER CONCENTRATION IN SOIL
16TP37

TETRA TECH

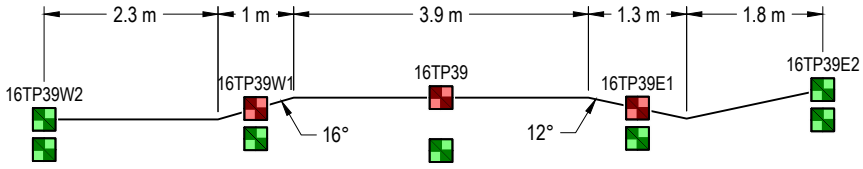
PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 23



TOP VIEW



SECTION VIEW

ISSUED FOR USE

LEGEND

- Soil sample locations
- Copper concentration in soil exceeds CCME Residential, Park and Commercial Guidelines
- Copper concentration in soil less than CCME Residential, Park and Commercial Guidelines

VERTICAL SCALE 1:100

1 0 1 2 4m

HORIZONTAL SCALE 1:100

1 0 1 2 4m

CLIENT

OKANAGAN INDIAN BAND AND INDIGENOUS AND NORTHERN AFFAIRS CANADA

TETRA TECH

PHASE III ESA - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

COPPER CONCENTRATION IN SOIL
16TP39

PROJECT NO.	DWN	CKD	REV
ENW.VENW03093-01	RH	DW	0

OFFICE	DATE
VANC	December 20, 2017

Figure 24

APPENDIX B
GROUNDWATER QUALITY INVESTIGATION

BOREHOLE DRILLING AND MONITORING WELL INSTALLATION

On March 24 and 25, 2018, four boreholes (18MW101 to 18MW04) were advanced along the Canadian National (CN) rail way right-of-way (RoW) that lies within the boundaries of the Duck Lake Indian Reserve (IR) 7 located near the northern limits of Kelowna, BC; specifically, CN Mile 105.9 to 106.6 and Mile 107.0 to 107.5. The boreholes were drilled using a truck-mounted ODEX drill rig supplied and operated by Mud Bay Drilling Co. Ltd., and were advanced to depths ranging from 4.27 mbgs to 13.72 mbgs.

During drilling, soil stratigraphy was logged based on the observations of the cuttings blown out between the outer casing and the inner hammer rod. No soil samples were collected for analyses. Borehole logs are attached.

The installation of groundwater monitoring wells Nos. 18MW01, 18MW02, 18MW03, and 18MW04 was completed by Mud Bay at the borehole locations as instructed by Tetra Tech. Monitoring wells were installed immediately following drilling. The monitoring wells were installed to depths ranging from 3.5 m to 10.55 m bgs. Monitoring wells were constructed using 50 mm diameter, screw-jointed Schedule 40 polyvinyl chloride casing, which was factory washed and bagged to prevent contamination prior to use at the site. A 1.52 m long well screen was constructed using a length of machine-slotted screen (0.010 inch openings) below unslotted riser pipe. The screens were surrounded by a silica sand filter pack where native soils had not sloughed in around the screen. The silica sand filter pack extended to approximately 0.3 m above the top of the screen. Bentonite pellets were placed above the sand, as per the attached borehole logs. Each monitoring well was topped with approximately 0.5 m of silica sand, 0.3 m of cement, and completed with a flush-mounted monument. The locations of the monitoring wells are shown on Figure B-1.

WELL DEVELOPMENT, PURGING, AND SAMPLING

Tetra Tech developed the four installed groundwater monitoring wells to remove water and sediment introduced during the drilling and well installation process, and to improve the hydraulic connection with the surrounding aquifer material. On April 10, 2018, the groundwater wells were monitored and developed as follows:

- Total well depth and depth to groundwater (measured from the top of well casing) was measured within each monitoring well to determine the volume of water within the well; and
- Monitoring wells were developed by removing at least six well volumes of water, or until purged dry at least six times, or until groundwater was running clear using a dedicated High-Density Polyethylene (HDPE) tubing attached to a four-stage submersible pump.

Table 2-2 below provides specific development details for each groundwater monitoring well.

Table 2-2: Well Development Details for Groundwater Wells

Monitoring Well	Approximate Well Volumes / Litres of Groundwater Removed During Well Development (April 10, 2018)	Screen Depth (mbgs)	Method	Notes
18MW01	4.24 volumes / 77.4 L	9.03 – 10.55	HDPE Tubing with a submersible pump	▪ Well volume prior to development was 4.24 L. ▪ Very good recharge. ▪ High turbidity at the beginning, clearing by the end of development. ▪ No noticeable hydrocarbon odour or visible sheen was noted.

Table 2-2: Well Development Details for Groundwater Wells

Monitoring Well	Approximate Well Volumes / Litres of Groundwater Removed During Well Development (April 10, 2018)	Screen Depth (mbgs)	Method	Notes
18MW02	2.29 volumes / 150 L	8.85 – 10.27	HDPE Tubing with a submersible pump	▪ Well volume prior to development was 2.29 L. ▪ Very good recharge. ▪ High turbidity at the beginning, clearing by the end of development. ▪ No noticeable hydrocarbon odour or visible sheen was noted.
18MW03	4.43 volumes / 158 L	1.9 – 3.5	HDPE Tubing with a submersible pump	▪ Well volume prior to development was 4.43 L. ▪ Very good recharge. ▪ High turbidity at the beginning, clearing by the end of development. ▪ No noticeable hydrocarbon odour or visible sheen was noted.
18MW04	4.2 volumes / 150 L	8.83 – 10.35	HDPE Tubing with a submersible pump	▪ Well volume prior to development was 4.2 L. ▪ Very good recharge. ▪ High turbidity at the beginning, clearing by the end of development. ▪ No noticeable hydrocarbon odour or visible sheen was noted.

WELL PURGING AND GROUNDWATER SAMPLING

Following well developing, two groundwater purging and sampling events were completed on April 12, 2018, and June 16, 2018, the wells were purged before sampling using a low-flow sampling technique. The low-flow sampling technique was carried out by inserting new 6.3 mm (0.25 inch) diameter high-density polyethylene (HDPE) tubing into each well with its intake at the calculated saturated interval midpoint, or at the midpoint of the well screen if the water level in the well is above the screen depth. Water is then purged from each well at a rate not exceeding 100 mL/min using a peristaltic pump. The depth to groundwater was monitored in the well during purging to confirm that the purging rate was sufficiently low and that the static elevation of groundwater in the well was not appreciably drawn down during purging and sampling. The low flow sampling technique helps to ensure the properties of the water being sampled are representative of the water in the formation around the well.

Physical parameters of the purged groundwater (i.e., temperature, pH, and electrical conductivity (EC), are measured during purging. The wells were sampled when all these physical parameters stabilized within 10% and the water level decreased by less than 0.1 m for three consecutive readings during purging.

Tetra Tech followed its standard QA/QC procedures during sampling to obtain representative groundwater samples and to minimize the potential for cross contamination. Groundwater samples were collected and submitted to CARO Analytical Services for analysis of PAHs and dissolved copper. Samples collected for PAH analyses were preserved in the field using laboratory supplied and measured aliquots of sodium bisulfate. Samples collected for dissolved copper analysis were field filtered and preserved with nitric acid supplied by the laboratory. Samples for PAHs were collected into one laboratory supplied 250 mL amber glass bottles with Teflon-lined caps. Dissolved copper samples were collect in one laboratory supplied 100 mL acid washed plastic bottle.

Groundwater samples were placed into new, clean, and labelled sample bottles supplied by CARO Analytical Services. The groundwater samples were stored in ice-chilled coolers, and submitted in-person to CARO Analytical Services using chain-of-custody procedures.

Table 1: Depths to Groundwater

Monitoring Well	Easting (m)	Northing (m)	Depth to Groundwater (m-btoc) [1]	
			12-Apr-18	6-Jun-18
18MW01	328170	5543538	8.43	7.48
18MW02	328313	5542984	9.22	8.98
18MW03	328784	5541894	1.29	1.69
18MW04	328929	55431269	8.25	7.80

NOTES

[1] m-btoc indicates metres below top of PVC casing.

Table 3: Groundwater Quality Assurance/Quality Control Analytical Results

		Field ID	18MW01	Dup #1	RPD (%)	18MW01	DUP#2	RPD (%)
		Sample Date	12-Apr-2018	12-Apr-2018		6-Jun-2018	6-Jun-2018	
		Laboratory Report Number	8041171	8041171		8060739	8060739	
		Laboratory Sample ID	8041171-01	8041171-05		8060739-01	8060739-05	
Parameter	**Unit**	**RDL**						
Dissolved Metals								
Copper	µg/L	0.4	0.42	0.46	-	4.59	5.22	13
Polycyclic Aromatic Hydrocarbons (PAHs)								
Acenaphthene	µg/L	0.05	<0.050	<0.050	-	<0.050	<0.050	-
Acenaphthylene	µg/L	0.2	<0.20	<0.20	-	<0.20	<0.20	-
Acridine	µg/L	0.05	<0.050	<0.050	-	<0.050	<0.050	-
Anthracene	µg/L	0.01	<0.010	<0.010	-	<0.010	<0.010	-
Benz(a)anthracene	µg/L	0.01	<0.010	<0.010	-	<0.010	<0.010	-
Benzo(a)pyrene	µg/L	0.01	<0.010	<0.010	-	<0.010	<0.010	-
Benzo(b+j)fluoranthene	µg/L	0.05	<0.050	<0.050	-	<0.050	<0.050	-
Benzo(g,h,i)perylene	µg/L	0.05	<0.050	<0.050	-	<0.050	<0.050	-
Benzo(k)fluoranthene	µg/L	0.05	<0.050	<0.050	-	<0.050	<0.050	-
2-Chloronaphthalene	µg/L	0.1	<0.10	<0.10	-	<0.10	<0.10	-
Chrysene	µg/L	0.05	<0.050	<0.050	-	<0.050	<0.050	-
Dibenz(a,h)anthracene	µg/L	0.01	<0.010	0.017	-	<0.010	<0.010	-
Fluoranthene	µg/L	0.03	<0.030	<0.030	-	<0.030	<0.030	-
Fluorene	µg/L	0.05	<0.050	<0.050	-	<0.050	<0.050	-
Indeno(1,2,3-c,d)pyrene	µg/L	0.05	<0.050	<0.050	-	<0.050	<0.050	-
1-Methylnaphthalene	µg/L	0.1	<0.10	<0.10	-	<0.10	<0.10	-
2-Methylnaphthalene	µg/L	0.1	<0.10	<0.10	-	<0.10	<0.10	-
Naphthalene	µg/L	0.2	<0.20	<0.20	-	<0.20	<0.20	-
Phenanthrene	µg/L	0.1	<0.10	<0.10	-	<0.10	<0.10	-
Pyrene	µg/L	0.02	<0.020	<0.020	-	<0.020	<0.020	-
Quinoline	µg/L	0.05	<0.050	<0.050	-	<0.050	<0.050	-

Notes:

RDL - Reportable detection limit

RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100

"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.

BOLD - RPD value greater than 30%

Table 2: Groundwater Analytical Results

						Location	18MW01				18MW02		18MW03		18MW04	
						Field ID	18MW01	Dup #1	18MW01	DUP#2	18MW02	18MW02	18MW03	18MW03	18MW04	18MW04
						Sample Date	12-Apr-2018	12-Apr-2018	6-Jun-2018	6-Jun-2018	13-Apr-2018	6-Jun-2018	12-Apr-2018	6-Jun-2018	12-Apr-2018	6-Jun-2018
						Laboratory Report Number	8041171	8041171	8060739	8060739	8041171	8060739	8041171	8060739	8041171	8060739
						Laboratory Sample ID	8041171-01	8041171-05	8060739-01	8060739-05	8041171-02	8060739-02	8041171-03	8060739-03	8041171-04	8060739-04
Parameter	**Unit**	**Canadian Drinking Water[1]**		**FIGQG[2]**	**BC CSR[3]**											
		MAC	**Other**		**Fresh AW**	**DW**										
Dissolved Metals																
Copper	µg/L	-	1000	2[4]	20[4]	1500	0.42	0.46	**4.59**	**5.22**	0.66	0.69	1.75	0.99	1.37	1.36
Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	µg/L	-	-	5.8	60	250	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Acenaphthylene	µg/L	-	-	46	-	-	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acridine	µg/L	-	-	0.05	0.5	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Anthracene	µg/L	-	-	0.012	1	1000	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benz(a)anthracene	µg/L	-	-	0.018	1	0.07	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(a)pyrene	µg/L	0.04	-	0.015	0.1	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(b+j)fluoranthene	µg/L	-	-	0.48	-	0.07	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(g,h,i)perylene	µg/L	-	-	0.17	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	µg/L	-	-	0.48	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-Chloronaphthalene	µg/L	-	-	-	-	300	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	µg/L	-	-	1.4	1	7	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dibenz(a,h)anthracene	µg/L	-	-	0.26	-	0.01	<0.010	**0.017**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Fluoranthene	µg/L	-	-	0.04	2	150	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Fluorene	µg/L	-	-	3	120	150	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Indeno(1,2,3-c,d)pyrene	µg/L	-	-	0.21	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1-Methylnaphthalene	µg/L	-	-	180	-	5.5	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
2-Methylnaphthalene	µg/L	-	-	180	-	15	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Naphthalene	µg/L	-	-	1.1	10	80	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Phenanthrene	µg/L	-	-	0.4	3	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Pyrene	µg/L	-	-	0.025	0.2	100	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Quinoline	µg/L	-	-	3.4	34	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050

Notes:

[1] Health Canada Federal-Provincial-Territorial Committee on Drinking Water (February 2017). Guidelines for Canadian Drinking Water Quality Summary Table (GCDWQ)
MAC refers to the Maximum Acceptable Concentration according to the GCDWQ criteria.
Other Value refers to the aesthetic objectives or operational guidance values according to the GCDWQ criteria.

[2] Environment Canada (November 2015). Guidance Document on Federal Interim Groundwater Quality Guidelines (FIGQG) for Federal Contaminated Sites, Tier 2 Freshwater Life pathway only, fine and coarse soil type, most conservative value shown

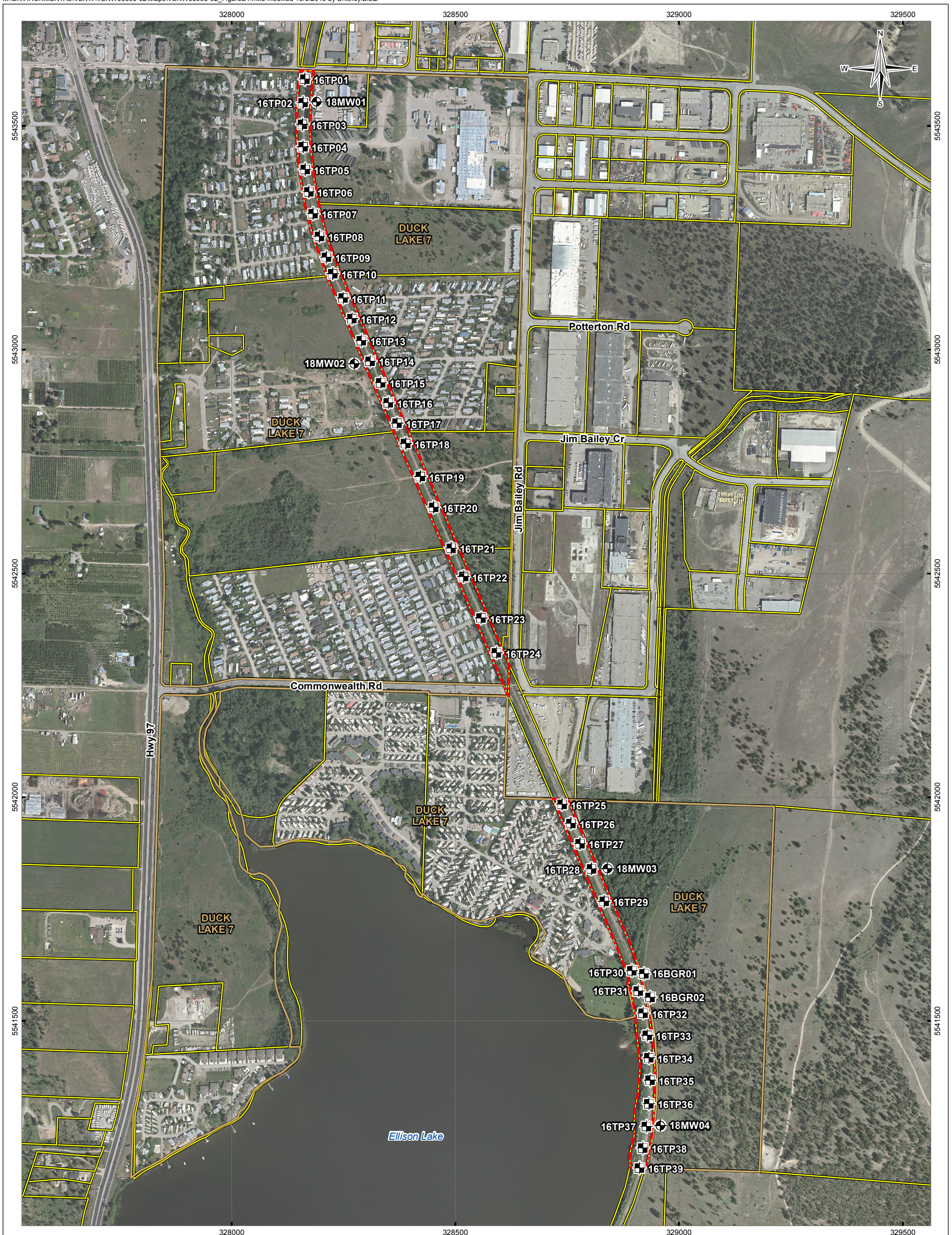
[3] BC Contaminated Sites Regulation (BC Reg. 375/96, includes amendments up to B.C. Reg. 253/2016, November 1, 2017) Schedule 3.2 Generic Numerical Water Standards for Freshwater Aquatic Life (AW) and Drinking Water (DW)

[4] Guideline/standard varies with hardness. Most conservative value applied

"-" No applicable guideline

BOLD - Greater than GCDWQ, FIGQG, or CSR Guideline

M:\ENVIRONMENTAL\VENW\VENW03093-02\Maps\VENW03093-02_FigureB1.mxd modified 10/3/2018 by Brittney.Bietz



LEGEND

- Testpit
- Groundwater Monitoring Well
- Site Boundary
- Parcel Boundary
- IR Boundary

NOTES
Base data source:
Indian Reserve Administrative Boundaries provided by DataBC.
Parcel boundaries and 2015 imagery provided by the City of Kelowna.

STATUS
ISSUED FOR USE

GROUNDWATER QUALITY INVESTIGATION - CN RAIL ROW
MILE 105.9 TO 106.6 AND MILE 107.0 TO 107.5
DUCK LAKE IR 7

Groundwater Monitoring Well Location Plan

PROJECTION	DATUM	CLIENT
UTM Zone 11	NAD83	Okanagan Indian Band, Indigenous and Northern Affairs Canada and CN Railway

Scale: 1:8,000
100 50 0 100
Metres

TETRA TECH EBA

FILE NO.				
VENW03093-02_FigureB1.mxd				
PROJECT NO.	**DWN**	**CKD**	**APVD**	**REV**
ENW.VENW03093-02	BB	SL	DW	0
OFFICE	**DATE**			
Tt EBA-CAL	June 28, 2018			

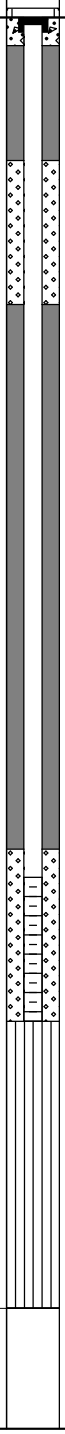
Figure B-1

Okanagan Indian Band

Borehole No: **18MW01**

Project: Risk Assessment - GW Investigation	Project No: ENW.VENW03093-02
Location: CN ROW, Mile 105.9 - 106.6 and 107.0 - 108.5	
Kelowna, British Columbia	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Notes and Comments
0		TOPSOIL			Road box and cement
		SAND - trace silt, dry, medium brown, fine sand, no visible staining, no discernible hydrocarbon odour			
1		SAND AND GRAVEL - trace silt, dry, medium brown, no visible staining, no discernible hydrocarbon odour			
2					
3				SA1	
4		GRAVEL - sandy, trace silt, dry, light to medium brown, no visible staining, no discernible hydrocarbon odour			
5					
6	Solid stem auger			SA2	
7					
8		- occasional cobble			
9		- some silt		SA3	
10					
11					
12				SA4	
13					
14		END OF BOREHOLE (13.72 metres) slough - 10.67 metres Monitoring well installed to 10.67 metres			
15					



Depth (ft): 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48

TETRA TECH

Contractor: Mud Bay Drilling Ltd.	Completion Depth: 13.72 m
Drilling Rig Type: Truck mounted	Start Date: 2018 March 24
Logged By: CC	Completion Date: 2018 March 24
Reviewed By: DW	Page 1 of 1

Borehole No: **18MW02**

Okanagan Indian Band

Project: Risk Assessment - GW Investigation	Project No: ENW.VENW03093-02
Location: CN ROW, Mile 105.9 - 106.6 and 107.0 - 108.5	
Kelowna, British Columbia	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Notes and Comments	Depth (ft)
0						0
	Solid stem auger	TOPSOIL			Road box and cement	
		SAND - trace silt, dry, loose to compact, medium brown, fine sand, no visible staining, no discernible hydrocarbon odour				
3				SA1		10
5		SAND AND GRAVEL - trace silt, dry, compact, light to medium brown, no visible staining, no discernible hydrocarbon odour				16
6				SA2		20
9		- moist to wet		SA3		30
11		END OF BOREHOLE (10.67 metres) Monitoring well installed to 10.67 metres				36

18MW02

TETRA TECH

Contractor: Mud Bay Drilling Ltd.	Completion Depth: 10.67 m
Drilling Rig Type: Truck mounted	Start Date: 2018 March 24
Logged By: CC	Completion Date: 2018 March 24
Reviewed By: DW	Page 1 of 1

Borehole No: **18MW03**

Okanagan Indian Band

Project: Risk Assessment - GW Investigation	Project No: ENW.VENW03093-02
Location: CN ROW, Mile 105.9 - 106.6 and 107.0 - 108.5	
Kelowna, British Columbia	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Notes and Comments	18MW03	Depth (ft)
0							0
0 – 1	Solid stem auger	SAND AND GRAVEL - trace silt, dry, compact, medium brown, no visible staining, no discernible hydrocarbon odour			Road box and cement		2
1 – 2		SAND - some silt to silty, trace gravel, moist, compact, medium brown, no visible staining, no discernible hydrocarbon odour					4 – 6
2 – 3		- wet		SA1			8 – 10
3 – 4							12 – 14
4 – 5		END OF BOREHOLE (4.27 metres) Monitoring well installed to 4.27 metres					16 – 18
5 – 6							20
6 – 7							22
7 – 8							24
8 – 9							26 – 28
9 – 10							30
10 – 11							32 – 34
11 – 12							36
12 – 13							38 – 40
13 – 14							42
14 – 15							44 – 46
							48

TETRA TECH

Contractor: Mud Bay Drilling Ltd.	Completion Depth: 4.27 m
Drilling Rig Type: Truck mounted	Start Date: 2018 March 24
Logged By: CC	Completion Date: 2018 March 24
Reviewed By: DW	Page 1 of 1

Okanagan Indian Band

Borehole No: **18MW04**

Project: Risk Assessment - GW Investigation | Project No: ENW.VENW03093-02

Location: CN ROW, Mile 105.9 - 106.6 and 107.0 - 108.5

Kelowna, British Columbia

Depth (m)	Method	Soil Description	Sample Type	Sample Number	Notes and Comments
0	Solid stem auger	SAND AND GRAVEL - trace silt, dry, compact, medium brown, no visible staining, no discernible hydrocarbon odour		SA1	Road box and cement
3		SAND - some gravel, trace silt, dry, compact, medium brown, no visible staining, no discernible hydrocarbon odour			
6		- moist, light brown		SA2	
9 ▼				SA3	
10.67		END OF BOREHOLE (10.67 metres) water - 9.14 metres Monitoring well installed to 10.36 metres			

18MW04

Depth (ft): 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 ▼, 32, 34, 36, 38, 40, 42, 44, 46, 48

TETRA TECH

Contractor: Mud Bay Drilling Ltd. | Completion Depth: 10.67 m

Drilling Rig Type: Truck mounted | Start Date: 2018 March 25

Logged By: CC | Completion Date: 2018 March 25

Reviewed By: DW | Page 1 of 1

ENVIRONMENTAL ENW-VENW03093-02.GPJ EBA.GDT 18/7/3

CERTIFICATE OF ANALYSIS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna) 150 - 1715 Dickson Ave. Kelowna, BC V1Y 9G6		
ATTENTION	Chris Chu	**WORK ORDER**	8041171
PO NUMBER		**RECEIVED / TEMP**	2018-04-13 11:50 / 6°C
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-04-20 13:12
PROJECT INFO		**COC NUMBER**	B59081

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO 17025:2005 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

If you have any questions or concerns, please contact me at jnobrega@caro.ca

Authorized By:

Jessica Nobrega, B.Sc.
Client Service Manager

TEST RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8041171
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-04-20 13:12

Analyte	Result	RL	Units	Analyzed	Qualifier
18MW01 (8041171-01) | Matrix: Water | Sampled: 2018-04-12 15:36					
Dissolved Metals					
Copper, dissolved	**0.00042**	0.00040	mg/L	2018-04-19	
Polycyclic Aromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.050	0.050	µg/L	2018-04-20	
Acenaphthylene	< 0.200	0.200	µg/L	2018-04-20	
Acridine	< 0.050	0.050	µg/L	2018-04-20	
Anthracene	< 0.010	0.010	µg/L	2018-04-20	
Benz(a)anthracene	< 0.010	0.010	µg/L	2018-04-20	
Benzo(a)pyrene	< 0.010	0.010	µg/L	2018-04-20	
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L	2018-04-20	
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L	2018-04-20	
Benzo(k)fluoranthene	< 0.050	0.050	µg/L	2018-04-20	
2-Chloronaphthalene	< 0.100	0.100	µg/L	2018-04-20	
Chrysene	< 0.050	0.050	µg/L	2018-04-20	
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L	2018-04-20	
Fluoranthene	< 0.030	0.030	µg/L	2018-04-20	
Fluorene	< 0.050	0.050	µg/L	2018-04-20	
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L	2018-04-20	
1-Methylnaphthalene	< 0.100	0.100	µg/L	2018-04-20	
2-Methylnaphthalene	< 0.100	0.100	µg/L	2018-04-20	
Naphthalene	< 0.200	0.200	µg/L	2018-04-20	
Phenanthrene	< 0.100	0.100	µg/L	2018-04-20	
Pyrene	< 0.020	0.020	µg/L	2018-04-20	
Quinoline	< 0.050	0.050	µg/L	2018-04-20	
Surrogate: Acridine-d9	*71*	*50-140*	%	*2018-04-20*	
Surrogate: Naphthalene-d8	*85*	*50-140*	%	*2018-04-20*	
Surrogate: Perylene-d12	*92*	*50-140*	%	*2018-04-20*	
18MW02 (8041171-02) | Matrix: Water | Sampled: 2018-04-13 11:17					
Dissolved Metals					
Copper, dissolved	**0.00066**	0.00040	mg/L	2018-04-19	
Polycyclic Aromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.050	0.050	µg/L	2018-04-20	
Acenaphthylene	< 0.200	0.200	µg/L	2018-04-20	
Acridine	< 0.050	0.050	µg/L	2018-04-20	
Anthracene	< 0.010	0.010	µg/L	2018-04-20	
Benz(a)anthracene	< 0.010	0.010	µg/L	2018-04-20	
Benzo(a)pyrene	< 0.010	0.010	µg/L	2018-04-20	
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L	2018-04-20	
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L	2018-04-20	
Benzo(k)fluoranthene	< 0.050	0.050	µg/L	2018-04-20	

TEST RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8041171
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-04-20 13:12

Analyte	Result	RL	Units	Analyzed	Qualifier
18MW02 (8041171-02) | Matrix: Water | Sampled: 2018-04-13 11:17, Continued					
Polycyclic Aromatic Hydrocarbons (PAH), Continued					
2-Chloronaphthalene	< 0.100	0.100	µg/L	2018-04-20	
Chrysene	< 0.050	0.050	µg/L	2018-04-20	
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L	2018-04-20	
Fluoranthene	< 0.030	0.030	µg/L	2018-04-20	
Fluorene	< 0.050	0.050	µg/L	2018-04-20	
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L	2018-04-20	
1-Methylnaphthalene	< 0.100	0.100	µg/L	2018-04-20	
2-Methylnaphthalene	< 0.100	0.100	µg/L	2018-04-20	
Naphthalene	< 0.200	0.200	µg/L	2018-04-20	
Phenanthrene	< 0.100	0.100	µg/L	2018-04-20	
Pyrene	< 0.020	0.020	µg/L	2018-04-20	
Quinoline	< 0.050	0.050	µg/L	2018-04-20	
Surrogate: Acridine-d9	*68*	*50-140*	%	*2018-04-20*	
Surrogate: Naphthalene-d8	*89*	*50-140*	%	*2018-04-20*	
Surrogate: Perylene-d12	*96*	*50-140*	%	*2018-04-20*	
18MW03 (8041171-03) | Matrix: Water | Sampled: 2018-04-12 17:22					
Dissolved Metals					
Copper, dissolved	**0.00175**	0.00040	mg/L	2018-04-19	
Polycyclic Aromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.050	0.050	µg/L	2018-04-20	
Acenaphthylene	< 0.200	0.200	µg/L	2018-04-20	
Acridine	< 0.050	0.050	µg/L	2018-04-20	
Anthracene	< 0.010	0.010	µg/L	2018-04-20	
Benz(a)anthracene	< 0.010	0.010	µg/L	2018-04-20	
Benzo(a)pyrene	< 0.010	0.010	µg/L	2018-04-20	
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L	2018-04-20	
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L	2018-04-20	
Benzo(k)fluoranthene	< 0.050	0.050	µg/L	2018-04-20	
2-Chloronaphthalene	< 0.100	0.100	µg/L	2018-04-20	
Chrysene	< 0.050	0.050	µg/L	2018-04-20	
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L	2018-04-20	
Fluoranthene	< 0.030	0.030	µg/L	2018-04-20	
Fluorene	< 0.050	0.050	µg/L	2018-04-20	
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L	2018-04-20	
1-Methylnaphthalene	< 0.100	0.100	µg/L	2018-04-20	
2-Methylnaphthalene	< 0.100	0.100	µg/L	2018-04-20	
Naphthalene	< 0.200	0.200	µg/L	2018-04-20	
Phenanthrene	< 0.100	0.100	µg/L	2018-04-20	
Pyrene	< 0.020	0.020	µg/L	2018-04-20	
Quinoline	< 0.050	0.050	µg/L	2018-04-20	

TEST RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8041171
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-04-20 13:12

Analyte	Result	RL	Units	Analyzed	Qualifier
18MW03 (8041171-03) | Matrix: Water | Sampled: 2018-04-12 17:22, Continued					
Polycyclic Aromatic Hydrocarbons (PAH), Continued					
Surrogate: Acridine-d9	*72*	*50-140*	%	*2018-04-20*	
Surrogate: Naphthalene-d8	*90*	*50-140*	%	*2018-04-20*	
Surrogate: Perylene-d12	*91*	*50-140*	%	*2018-04-20*	
18MW04 (8041171-04) | Matrix: Water | Sampled: 2018-04-12 18:12					
Dissolved Metals					
Copper, dissolved	**0.00137**	0.00040	mg/L	2018-04-19	
Polycyclic Aromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.050	0.050	µg/L	2018-04-20	
Acenaphthylene	< 0.200	0.200	µg/L	2018-04-20	
Acridine	< 0.050	0.050	µg/L	2018-04-20	
Anthracene	< 0.010	0.010	µg/L	2018-04-20	
Benz(a)anthracene	< 0.010	0.010	µg/L	2018-04-20	
Benzo(a)pyrene	< 0.010	0.010	µg/L	2018-04-20	
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L	2018-04-20	
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L	2018-04-20	
Benzo(k)fluoranthene	< 0.050	0.050	µg/L	2018-04-20	
2-Chloronaphthalene	< 0.100	0.100	µg/L	2018-04-20	
Chrysene	< 0.050	0.050	µg/L	2018-04-20	
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L	2018-04-20	
Fluoranthene	< 0.030	0.030	µg/L	2018-04-20	
Fluorene	< 0.050	0.050	µg/L	2018-04-20	
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L	2018-04-20	
1-Methylnaphthalene	< 0.100	0.100	µg/L	2018-04-20	
2-Methylnaphthalene	< 0.100	0.100	µg/L	2018-04-20	
Naphthalene	< 0.200	0.200	µg/L	2018-04-20	
Phenanthrene	< 0.100	0.100	µg/L	2018-04-20	
Pyrene	< 0.020	0.020	µg/L	2018-04-20	
Quinoline	< 0.050	0.050	µg/L	2018-04-20	
Surrogate: Acridine-d9	*73*	*50-140*	%	*2018-04-20*	
Surrogate: Naphthalene-d8	*92*	*50-140*	%	*2018-04-20*	
Surrogate: Perylene-d12	*93*	*50-140*	%	*2018-04-20*	
Dup #1 (8041171-05) | Matrix: Water | Sampled: 2018-04-12 15:40					
Dissolved Metals					
Copper, dissolved	**0.00046**	0.00040	mg/L	2018-04-19	
Polycyclic Aromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.050	0.050	µg/L	2018-04-20	
Acenaphthylene	< 0.200	0.200	µg/L	2018-04-20	

TEST RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8041171
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-04-20 13:12

Analyte	Result	RL	Units	Analyzed	Qualifier
Dup #1 (8041171-05) | Matrix: Water | Sampled: 2018-04-12 15:40, Continued					
Polycyclic Aromatic Hydrocarbons (PAH), Continued					
Acridine	< 0.050	0.050	µg/L	2018-04-20	
Anthracene	< 0.010	0.010	µg/L	2018-04-20	
Benz(a)anthracene	< 0.010	0.010	µg/L	2018-04-20	
Benzo(a)pyrene	< 0.010	0.010	µg/L	2018-04-20	
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L	2018-04-20	
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L	2018-04-20	
Benzo(k)fluoranthene	< 0.050	0.050	µg/L	2018-04-20	
2-Chloronaphthalene	< 0.100	0.100	µg/L	2018-04-20	
Chrysene	< 0.050	0.050	µg/L	2018-04-20	
Dibenz(a,h)anthracene	**0.017**	0.010	µg/L	2018-04-20	
Fluoranthene	< 0.030	0.030	µg/L	2018-04-20	
Fluorene	< 0.050	0.050	µg/L	2018-04-20	
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L	2018-04-20	
1-Methylnaphthalene	< 0.100	0.100	µg/L	2018-04-20	
2-Methylnaphthalene	< 0.100	0.100	µg/L	2018-04-20	
Naphthalene	< 0.200	0.200	µg/L	2018-04-20	
Phenanthrene	< 0.100	0.100	µg/L	2018-04-20	
Pyrene	< 0.020	0.020	µg/L	2018-04-20	
Quinoline	< 0.050	0.050	µg/L	2018-04-20	
Surrogate: Acridine-d9	*73*	*50-140*	%	*2018-04-20*	
Surrogate: Naphthalene-d8	*90*	*50-140*	%	*2018-04-20*	
Surrogate: Perylene-d12	*97*	*50-140*	%	*2018-04-20*	

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8041171
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-04-20 13:12

Analysis Description	Method Ref.	Technique	Location
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Polycyclic Aromatic Hydrocarbons in Water	EPA 3511* / EPA 8270D	Hexane MicroExtraction (Base/Neutral) / GC-MSD (SIM)	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8041171
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-04-20 13:12

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B8D1195										
Blank (B8D1195-BLK1)				Prepared: 2018-04-18, Analyzed: 2018-04-18						
Copper, dissolved	< 0.00040	0.00040	mg/L							
LCS (B8D1195-BS1)				Prepared: 2018-04-18, Analyzed: 2018-04-18						
Copper, dissolved	0.0199	0.00040	mg/L	0.0200		100	80-120			
Reference (B8D1195-SRM1)				Prepared: 2018-04-18, Analyzed: 2018-04-18						
Copper, dissolved	0.835	0.00040	mg/L	0.844		99	90-115			
Polycyclic Aromatic Hydrocarbons (PAH), Batch B8D1327										
Blank (B8D1327-BLK1)				Prepared: 2018-04-19, Analyzed: 2018-04-19						
Acenaphthene	< 0.050	0.050	µg/L							
Acenaphthylene	< 0.200	0.200	µg/L							
Acridine	< 0.050	0.050	µg/L							
Anthracene	< 0.010	0.010	µg/L							
Benz(a)anthracene	< 0.010	0.010	µg/L							
Benzo(a)pyrene	< 0.010	0.010	µg/L							
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L							
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L							
Benzo(k)fluoranthene	< 0.050	0.050	µg/L							
2-Chloronaphthalene	< 0.100	0.100	µg/L							
Chrysene	< 0.050	0.050	µg/L							
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L							
Fluoranthene	< 0.030	0.030	µg/L							
Fluorene	< 0.050	0.050	µg/L							
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L							
1-Methylnaphthalene	< 0.100	0.100	µg/L							
2-Methylnaphthalene	< 0.100	0.100	µg/L							
Naphthalene	< 0.200	0.200	µg/L							
Phenanthrene	< 0.100	0.100	µg/L							
Pyrene	< 0.020	0.020	µg/L							
Quinoline	< 0.050	0.050	µg/L							
Surrogate: Acridine-d9	*3.95*		*µg/L*	4.44		*89*	*50-140*			
Surrogate: Naphthalene-d8	*3.99*		*µg/L*	4.44		*90*	*50-140*			
Surrogate: Perylene-d12	*4.43*		*µg/L*	4.44		*100*	*50-140*			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8041171
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-04-20 13:12

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Polycyclic Aromatic Hydrocarbons (PAH), Batch B8D1327, Continued										
LCS (B8D1327-BS1)				Prepared: 2018-04-19, Analyzed: 2018-04-19						
Acenaphthene	4.07	0.050	µg/L	4.40		93	58-125			
Acenaphthylene	4.24	0.200	µg/L	4.40		96	54-128			
Acridine	2.99	0.050	µg/L	4.44		67	50-112			
Anthracene	4.29	0.010	µg/L	4.44		97	66-125			
Benz(a)anthracene	4.84	0.010	µg/L	4.44		109	59-123			
Benzo(a)pyrene	4.58	0.010	µg/L	4.40		104	62-116			
Benzo(b+j)fluoranthene	9.16	0.050	µg/L	8.89		103	69-121			
Benzo(g,h,i)perylene	4.10	0.050	µg/L	4.40		93	58-129			
Benzo(k)fluoranthene	4.63	0.050	µg/L	4.44		104	67-128			
2-Chloronaphthalene	3.65	0.100	µg/L	4.44		82	50-140			
Chrysene	4.82	0.050	µg/L	4.42		109	58-125			
Dibenz(a,h)anthracene	4.14	0.010	µg/L	4.42		94	58-126			
Fluoranthene	4.27	0.030	µg/L	4.36		98	67-133			
Fluorene	4.06	0.050	µg/L	4.40		92	55-122			
Indeno(1,2,3-cd)pyrene	4.08	0.050	µg/L	4.44		92	62-126			
1-Methylnaphthalene	3.95	0.100	µg/L	4.38		90	53-125			
2-Methylnaphthalene	3.82	0.100	µg/L	4.36		88	52-122			
Naphthalene	3.90	0.200	µg/L	4.44		88	50-130			
Phenanthrene	4.29	0.100	µg/L	4.40		97	67-127			
Pyrene	4.30	0.020	µg/L	4.44		97	68-133			
Quinoline	6.02	0.050	µg/L	4.44		136	51-140			
Surrogate: Acridine-d9	*3.07*		*µg/L*	4.44		*69*	*50-140*			
Surrogate: Naphthalene-d8	*3.86*		*µg/L*	4.44		*87*	*50-140*			
Surrogate: Perylene-d12	*4.16*		*µg/L*	4.44		*94*	*50-140*			
LCS Dup (B8D1327-BSD1)				Prepared: 2018-04-19, Analyzed: 2018-04-19						
Acenaphthene	4.34	0.050	µg/L	4.40		99	58-125	6	16	
Acenaphthylene	4.51	0.200	µg/L	4.40		102	54-128	6	16	
Acridine	2.89	0.050	µg/L	4.44		65	50-112	3	26	
Anthracene	4.45	0.010	µg/L	4.44		100	66-125	4	14	
Benz(a)anthracene	4.96	0.010	µg/L	4.44		112	59-123	2	23	
Benzo(a)pyrene	4.74	0.010	µg/L	4.40		108	62-116	3	16	
Benzo(b+j)fluoranthene	9.26	0.050	µg/L	8.89		104	69-121	1	14	
Benzo(g,h,i)perylene	4.25	0.050	µg/L	4.40		97	58-129	4	25	
Benzo(k)fluoranthene	4.83	0.050	µg/L	4.44		109	67-128	4	18	
2-Chloronaphthalene	3.89	0.100	µg/L	4.44		88	50-140	6	30	
Chrysene	4.98	0.050	µg/L	4.42		113	58-125	3	24	
Dibenz(a,h)anthracene	4.30	0.010	µg/L	4.42		97	58-126	4	23	
Fluoranthene	4.41	0.030	µg/L	4.36		101	67-133	3	18	
Fluorene	4.30	0.050	µg/L	4.40		98	55-122	6	16	
Indeno(1,2,3-cd)pyrene	4.21	0.050	µg/L	4.44		95	62-126	3	22	
1-Methylnaphthalene	4.23	0.100	µg/L	4.38		97	53-125	7	16	
2-Methylnaphthalene	4.15	0.100	µg/L	4.36		95	52-122	8	17	
Naphthalene	4.20	0.200	µg/L	4.44		95	50-130	8	18	
Phenanthrene	4.45	0.100	µg/L	4.40		101	67-127	4	14	
Pyrene	4.43	0.020	µg/L	4.44		100	68-133	3	18	
Quinoline	6.18	0.050	µg/L	4.44		139	51-140	3	12	
Surrogate: Acridine-d9	*2.89*		*µg/L*	4.44		*65*	*50-140*			
Surrogate: Naphthalene-d8	*4.14*		*µg/L*	4.44		*93*	*50-140*			
Surrogate: Perylene-d12	*4.30*		*µg/L*	4.44		*97*	*50-140*			

CERTIFICATE OF ANALYSIS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna) 150 - 1715 Dickson Ave. Kelowna, BC V1Y 9G6		
ATTENTION	Chris Chu	**WORK ORDER**	8060739
PO NUMBER		**RECEIVED / TEMP**	2018-06-07 15:48 / 7°C
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-06-15 14:11
PROJECT INFO		**COC NUMBER**	B6241

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO 17025:2005 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

If you have any questions or concerns, please contact me at jnobrega@caro.ca

Authorized By:

Jessica Nobrega, B.Sc.
Client Service Manager

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8060739
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-06-15 14:11

Analyte	Result	RL	Units	Analyzed	Qualifier
18MW01 (8060739-01) | Matrix: Water | Sampled: 2018-06-06 16:04					
Dissolved Metals					
Copper, dissolved	**0.00459**	0.00040	mg/L	2018-06-14	
Polycyclic Aromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.050	0.050	µg/L	2018-06-14	
Acenaphthylene	< 0.200	0.200	µg/L	2018-06-14	
Acridine	< 0.050	0.050	µg/L	2018-06-14	
Anthracene	< 0.010	0.010	µg/L	2018-06-14	
Benz(a)anthracene	< 0.010	0.010	µg/L	2018-06-14	
Benzo(a)pyrene	< 0.010	0.010	µg/L	2018-06-14	
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L	2018-06-14	
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L	2018-06-14	
Benzo(k)fluoranthene	< 0.050	0.050	µg/L	2018-06-14	
2-Chloronaphthalene	< 0.100	0.100	µg/L	2018-06-14	
Chrysene	< 0.050	0.050	µg/L	2018-06-14	
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L	2018-06-14	
Fluoranthene	< 0.030	0.030	µg/L	2018-06-14	
Fluorene	< 0.050	0.050	µg/L	2018-06-14	
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L	2018-06-14	
1-Methylnaphthalene	< 0.100	0.100	µg/L	2018-06-14	
2-Methylnaphthalene	< 0.100	0.100	µg/L	2018-06-14	
Naphthalene	< 0.200	0.200	µg/L	2018-06-14	
Phenanthrene	< 0.100	0.100	µg/L	2018-06-14	
Pyrene	< 0.020	0.020	µg/L	2018-06-14	
Quinoline	< 0.050	0.050	µg/L	2018-06-14	
Surrogate: Acridine-d9	*71*	*50-140*	%	*2018-06-14*	
Surrogate: Naphthalene-d8	*90*	*50-140*	%	*2018-06-14*	
Surrogate: Perylene-d12	*77*	*50-140*	%	*2018-06-14*	
18MW02 (8060739-02) | Matrix: Water | Sampled: 2018-06-06 12:02					
Dissolved Metals					
Copper, dissolved	**0.00069**	0.00040	mg/L	2018-06-14	
Polycyclic Aromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.050	0.050	µg/L	2018-06-14	
Acenaphthylene	< 0.200	0.200	µg/L	2018-06-14	
Acridine	< 0.050	0.050	µg/L	2018-06-14	
Anthracene	< 0.010	0.010	µg/L	2018-06-14	
Benz(a)anthracene	< 0.010	0.010	µg/L	2018-06-14	
Benzo(a)pyrene	< 0.010	0.010	µg/L	2018-06-14	
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L	2018-06-14	
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L	2018-06-14	
Benzo(k)fluoranthene	< 0.050	0.050	µg/L	2018-06-14	

TEST RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8060739
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-06-15 14:11

Analyte	Result	RL	Units	Analyzed	Qualifier
18MW02 (8060739-02) | Matrix: Water | Sampled: 2018-06-06 12:02, Continued					
Polycyclic Aromatic Hydrocarbons (PAH), Continued					
2-Chloronaphthalene	< 0.100	0.100	µg/L	2018-06-14	
Chrysene	< 0.050	0.050	µg/L	2018-06-14	
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L	2018-06-14	
Fluoranthene	< 0.030	0.030	µg/L	2018-06-14	
Fluorene	< 0.050	0.050	µg/L	2018-06-14	
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L	2018-06-14	
1-Methylnaphthalene	< 0.100	0.100	µg/L	2018-06-14	
2-Methylnaphthalene	< 0.100	0.100	µg/L	2018-06-14	
Naphthalene	< 0.200	0.200	µg/L	2018-06-14	
Phenanthrene	< 0.100	0.100	µg/L	2018-06-14	
Pyrene	< 0.020	0.020	µg/L	2018-06-14	
Quinoline	< 0.050	0.050	µg/L	2018-06-14	
Surrogate: Acridine-d9	*69*	*50-140*	%	*2018-06-14*	
Surrogate: Naphthalene-d8	*88*	*50-140*	%	*2018-06-14*	
Surrogate: Perylene-d12	*79*	*50-140*	%	*2018-06-14*	
18MW03 (8060739-03) | Matrix: Water | Sampled: 2018-06-06 14:00					
Dissolved Metals					
Copper, dissolved	**0.00099**	0.00040	mg/L	2018-06-14	
Polycyclic Aromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.050	0.050	µg/L	2018-06-14	
Acenaphthylene	< 0.200	0.200	µg/L	2018-06-14	
Acridine	< 0.050	0.050	µg/L	2018-06-14	
Anthracene	< 0.010	0.010	µg/L	2018-06-14	
Benz(a)anthracene	< 0.010	0.010	µg/L	2018-06-14	
Benzo(a)pyrene	< 0.010	0.010	µg/L	2018-06-14	
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L	2018-06-14	
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L	2018-06-14	
Benzo(k)fluoranthene	< 0.050	0.050	µg/L	2018-06-14	
2-Chloronaphthalene	< 0.100	0.100	µg/L	2018-06-14	
Chrysene	< 0.050	0.050	µg/L	2018-06-14	
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L	2018-06-14	
Fluoranthene	< 0.030	0.030	µg/L	2018-06-14	
Fluorene	< 0.050	0.050	µg/L	2018-06-14	
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L	2018-06-14	
1-Methylnaphthalene	< 0.100	0.100	µg/L	2018-06-14	
2-Methylnaphthalene	< 0.100	0.100	µg/L	2018-06-14	
Naphthalene	< 0.200	0.200	µg/L	2018-06-14	
Phenanthrene	< 0.100	0.100	µg/L	2018-06-14	
Pyrene	< 0.020	0.020	µg/L	2018-06-14	
Quinoline	< 0.050	0.050	µg/L	2018-06-14	

TEST RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8060739
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-06-15 14:11

Analyte	Result	RL	Units	Analyzed	Qualifier
18MW03 (8060739-03) | Matrix: Water | Sampled: 2018-06-06 14:00, Continued					
Polycyclic Aromatic Hydrocarbons (PAH), Continued					
Surrogate: Acridine-d9	*74*	*50-140*	%	*2018-06-14*	
Surrogate: Naphthalene-d8	*86*	*50-140*	%	*2018-06-14*	
Surrogate: Perylene-d12	*64*	*50-140*	%	*2018-06-14*	
18MW04 (8060739-04) | Matrix: Water | Sampled: 2018-06-06 15:05					
Dissolved Metals					
Copper, dissolved	**0.00136**	0.00040	mg/L	2018-06-14	
Polycyclic Aromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.050	0.050	µg/L	2018-06-14	
Acenaphthylene	< 0.200	0.200	µg/L	2018-06-14	
Acridine	< 0.050	0.050	µg/L	2018-06-14	
Anthracene	< 0.010	0.010	µg/L	2018-06-14	
Benz(a)anthracene	< 0.010	0.010	µg/L	2018-06-14	
Benzo(a)pyrene	< 0.010	0.010	µg/L	2018-06-14	
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L	2018-06-14	
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L	2018-06-14	
Benzo(k)fluoranthene	< 0.050	0.050	µg/L	2018-06-14	
2-Chloronaphthalene	< 0.100	0.100	µg/L	2018-06-14	
Chrysene	< 0.050	0.050	µg/L	2018-06-14	
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L	2018-06-14	
Fluoranthene	< 0.030	0.030	µg/L	2018-06-14	
Fluorene	< 0.050	0.050	µg/L	2018-06-14	
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L	2018-06-14	
1-Methylnaphthalene	< 0.100	0.100	µg/L	2018-06-14	
2-Methylnaphthalene	< 0.100	0.100	µg/L	2018-06-14	
Naphthalene	< 0.200	0.200	µg/L	2018-06-14	
Phenanthrene	< 0.100	0.100	µg/L	2018-06-14	
Pyrene	< 0.020	0.020	µg/L	2018-06-14	
Quinoline	< 0.050	0.050	µg/L	2018-06-14	
Surrogate: Acridine-d9	*64*	*50-140*	%	*2018-06-14*	
Surrogate: Naphthalene-d8	*85*	*50-140*	%	*2018-06-14*	
Surrogate: Perylene-d12	*70*	*50-140*	%	*2018-06-14*	
DUP#2 (8060739-05) | Matrix: Water | Sampled: 2018-06-06 16:10					
Dissolved Metals					
Copper, dissolved	**0.00522**	0.00040	mg/L	2018-06-14	
Polycyclic Aromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.050	0.050	µg/L	2018-06-14	
Acenaphthylene	< 0.200	0.200	µg/L	2018-06-14	

TEST RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8060739
PROJECT	704-ENW.VENW03093-02	**REPORTED**	2018-06-15 14:11

Analyte	Result	RL	Units	Analyzed	Qualifier
DUP#2 (8060739-05) | Matrix: Water | Sampled: 2018-06-06 16:10, Continued					
Polycyclic Aromatic Hydrocarbons (PAH), Continued					
Acridine	< 0.050	0.050	µg/L	2018-06-14	
Anthracene	< 0.010	0.010	µg/L	2018-06-14	
Benz(a)anthracene	< 0.010	0.010	µg/L	2018-06-14	
Benzo(a)pyrene	< 0.010	0.010	µg/L	2018-06-14	
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L	2018-06-14	
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L	2018-06-14	
Benzo(k)fluoranthene	< 0.050	0.050	µg/L	2018-06-14	
2-Chloronaphthalene	< 0.100	0.100	µg/L	2018-06-14	
Chrysene	< 0.050	0.050	µg/L	2018-06-14	
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L	2018-06-14	
Fluoranthene	< 0.030	0.030	µg/L	2018-06-14	
Fluorene	< 0.050	0.050	µg/L	2018-06-14	
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L	2018-06-14	
1-Methylnaphthalene	< 0.100	0.100	µg/L	2018-06-14	
2-Methylnaphthalene	< 0.100	0.100	µg/L	2018-06-14	
Naphthalene	< 0.200	0.200	µg/L	2018-06-14	
Phenanthrene	< 0.100	0.100	µg/L	2018-06-14	
Pyrene	< 0.020	0.020	µg/L	2018-06-14	
Quinoline	< 0.050	0.050	µg/L	2018-06-14	
Surrogate: Acridine-d9	*75*	*50-140*	%	*2018-06-14*	
Surrogate: Naphthalene-d8	*90*	*50-140*	%	*2018-06-14*	
Surrogate: Perylene-d12	*82*	*50-140*	%	*2018-06-14*	

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8060739
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Analysis Description	Method Ref.	Technique	Location
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Polycyclic Aromatic Hydrocarbons in Water	EPA 3511* / EPA 8270D	Hexane MicroExtraction (Base/Neutral) / GC-MSD (SIM)	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
mg/L	Milligrams per litre
µg/L	Micrograms per litre
EPA	United States Environmental Protection Agency Test Methods

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8060739
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The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B8F1042										
Blank (B8F1042-BLK1)				Prepared: 2018-06-14, Analyzed: 2018-06-14						
Copper, dissolved	< 0.00040	0.00040	mg/L							
LCS (B8F1042-BS1)				Prepared: 2018-06-14, Analyzed: 2018-06-14						
Copper, dissolved	0.0192	0.00040	mg/L	0.0200		96	80-120			
Duplicate (B8F1042-DUP1)		**Source: 8060739-01**		Prepared: 2018-06-14, Analyzed: 2018-06-14						
Copper, dissolved	0.00452	0.00040	mg/L		0.00459			1	20	
Reference (B8F1042-SRM1)				Prepared: 2018-06-14, Analyzed: 2018-06-14						
Copper, dissolved	0.854	0.00040	mg/L	0.844		101	90-115			
Polycyclic Aromatic Hydrocarbons (PAH), Batch B8F1116										
Blank (B8F1116-BLK1)				Prepared: 2018-06-14, Analyzed: 2018-06-14						
Acenaphthene	< 0.050	0.050	µg/L							
Acenaphthylene	< 0.200	0.200	µg/L							
Acridine	< 0.050	0.050	µg/L							
Anthracene	< 0.010	0.010	µg/L							
Benz(a)anthracene	< 0.010	0.010	µg/L							
Benzo(a)pyrene	< 0.010	0.010	µg/L							
Benzo(b+j)fluoranthene	< 0.050	0.050	µg/L							
Benzo(g,h,i)perylene	< 0.050	0.050	µg/L							
Benzo(k)fluoranthene	< 0.050	0.050	µg/L							
2-Chloronaphthalene	< 0.100	0.100	µg/L							
Chrysene	< 0.050	0.050	µg/L							
Dibenz(a,h)anthracene	< 0.010	0.010	µg/L							
Fluoranthene	< 0.030	0.030	µg/L							
Fluorene	< 0.050	0.050	µg/L							
Indeno(1,2,3-cd)pyrene	< 0.050	0.050	µg/L							
1-Methylnaphthalene	< 0.100	0.100	µg/L							
2-Methylnaphthalene	< 0.100	0.100	µg/L							
Naphthalene	< 0.200	0.200	µg/L							
Phenanthrene	< 0.100	0.100	µg/L							
Pyrene	< 0.020	0.020	µg/L							
Quinoline	< 0.050	0.050	µg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8060739
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Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Polycyclic Aromatic Hydrocarbons (PAH), Batch B8F1116, Continued										
Blank (B8F1116-BLK1), Continued				Prepared: 2018-06-14, Analyzed: 2018-06-14						
Surrogate: Acridine-d9	*3.06*		*µg/L*	4.43		*69*	*50-140*			
Surrogate: Naphthalene-d8	*3.63*		*µg/L*	4.48		*81*	*50-140*			
Surrogate: Perylene-d12	*3.36*		*µg/L*	4.48		*75*	*50-140*			
LCS (B8F1116-BS1)				Prepared: 2018-06-14, Analyzed: 2018-06-14						
Acenaphthene	3.03	0.050	µg/L	4.42		69	58-125			
Acenaphthylene	3.37	0.200	µg/L	4.42		76	54-128			
Acridine	2.97	0.050	µg/L	4.46		66	50-112			
Anthracene	3.21	0.010	µg/L	4.46		72	66-125			
Benz(a)anthracene	3.55	0.010	µg/L	4.46		80	59-123			
Benzo(a)pyrene	2.94	0.010	µg/L	4.42		67	62-116			
Benzo(b+j)fluoranthene	6.08	0.050	µg/L	8.93		68	69-121			SPK1
Benzo(g,h,i)perylene	3.13	0.050	µg/L	4.42		71	58-129			
Benzo(k)fluoranthene	3.04	0.050	µg/L	4.46		68	67-128			
2-Chloronaphthalene	2.88	0.100	µg/L	4.46		65	50-140			
Chrysene	3.34	0.050	µg/L	4.44		75	58-125			
Dibenz(a,h)anthracene	3.28	0.010	µg/L	4.44		74	58-126			
Fluoranthene	4.29	0.030	µg/L	4.38		98	67-133			
Fluorene	3.28	0.050	µg/L	4.42		74	55-122			
Indeno(1,2,3-cd)pyrene	3.14	0.050	µg/L	4.46		70	62-126			
1-Methylnaphthalene	3.36	0.100	µg/L	4.40		76	53-125			
2-Methylnaphthalene	3.35	0.100	µg/L	4.38		77	52-122			
Naphthalene	3.57	0.200	µg/L	4.46		80	50-130			
Phenanthrene	3.52	0.100	µg/L	4.42		80	67-127			
Pyrene	4.22	0.020	µg/L	4.46		95	68-133			
Quinoline	6.08	0.050	µg/L	4.46		136	51-140			
Surrogate: Acridine-d9	*3.35*		*µg/L*	4.46		*75*	*50-140*			
Surrogate: Naphthalene-d8	*4.30*		*µg/L*	4.51		*95*	*50-140*			
Surrogate: Perylene-d12	*3.48*		*µg/L*	4.51		*77*	*50-140*			
LCS Dup (B8F1116-BSD1)				Prepared: 2018-06-14, Analyzed: 2018-06-14						
Acenaphthene	2.90	0.050	µg/L	4.46		65	58-125	4	16	
Acenaphthylene	3.20	0.200	µg/L	4.46		72	54-128	5	16	
Acridine	3.18	0.050	µg/L	4.50		71	50-112	7	26	
Anthracene	3.40	0.010	µg/L	4.50		76	66-125	6	14	
Benz(a)anthracene	3.88	0.010	µg/L	4.50		86	59-123	9	23	
Benzo(a)pyrene	3.18	0.010	µg/L	4.46		71	62-116	8	16	
Benzo(b+j)fluoranthene	6.43	0.050	µg/L	9.00		71	69-121	6	14	
Benzo(g,h,i)perylene	3.44	0.050	µg/L	4.46		77	58-129	9	25	
Benzo(k)fluoranthene	3.29	0.050	µg/L	4.50		73	67-128	8	18	
2-Chloronaphthalene	2.68	0.100	µg/L	4.50		59	50-140	7	30	
Chrysene	3.64	0.050	µg/L	4.48		81	58-125	9	24	
Dibenz(a,h)anthracene	3.57	0.010	µg/L	4.48		80	58-126	8	23	
Fluoranthene	4.68	0.030	µg/L	4.41		106	67-133	9	18	
Fluorene	3.27	0.050	µg/L	4.46		73	55-122	< 1	16	
Indeno(1,2,3-cd)pyrene	3.43	0.050	µg/L	4.50		76	62-126	9	22	
1-Methylnaphthalene	3.05	0.100	µg/L	4.43		69	53-125	9	16	
2-Methylnaphthalene	3.04	0.100	µg/L	4.41		69	52-122	10	17	
Naphthalene	3.19	0.200	µg/L	4.50		71	50-130	11	18	
Phenanthrene	3.68	0.100	µg/L	4.46		82	67-127	4	14	
Pyrene	4.62	0.020	µg/L	4.50		103	68-133	9	18	
Quinoline	5.99	0.050	µg/L	4.50		133	51-140	1	12	
Surrogate: Acridine-d9	*3.52*		*µg/L*	4.50		*78*	*50-140*			
Surrogate: Naphthalene-d8	*3.87*		*µg/L*	4.55		*85*	*50-140*			
Surrogate: Perylene-d12	*3.79*		*µg/L*	4.55		*83*	*50-140*			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Tetra Tech EBA Inc. (Kelowna)	**WORK ORDER**	8060739
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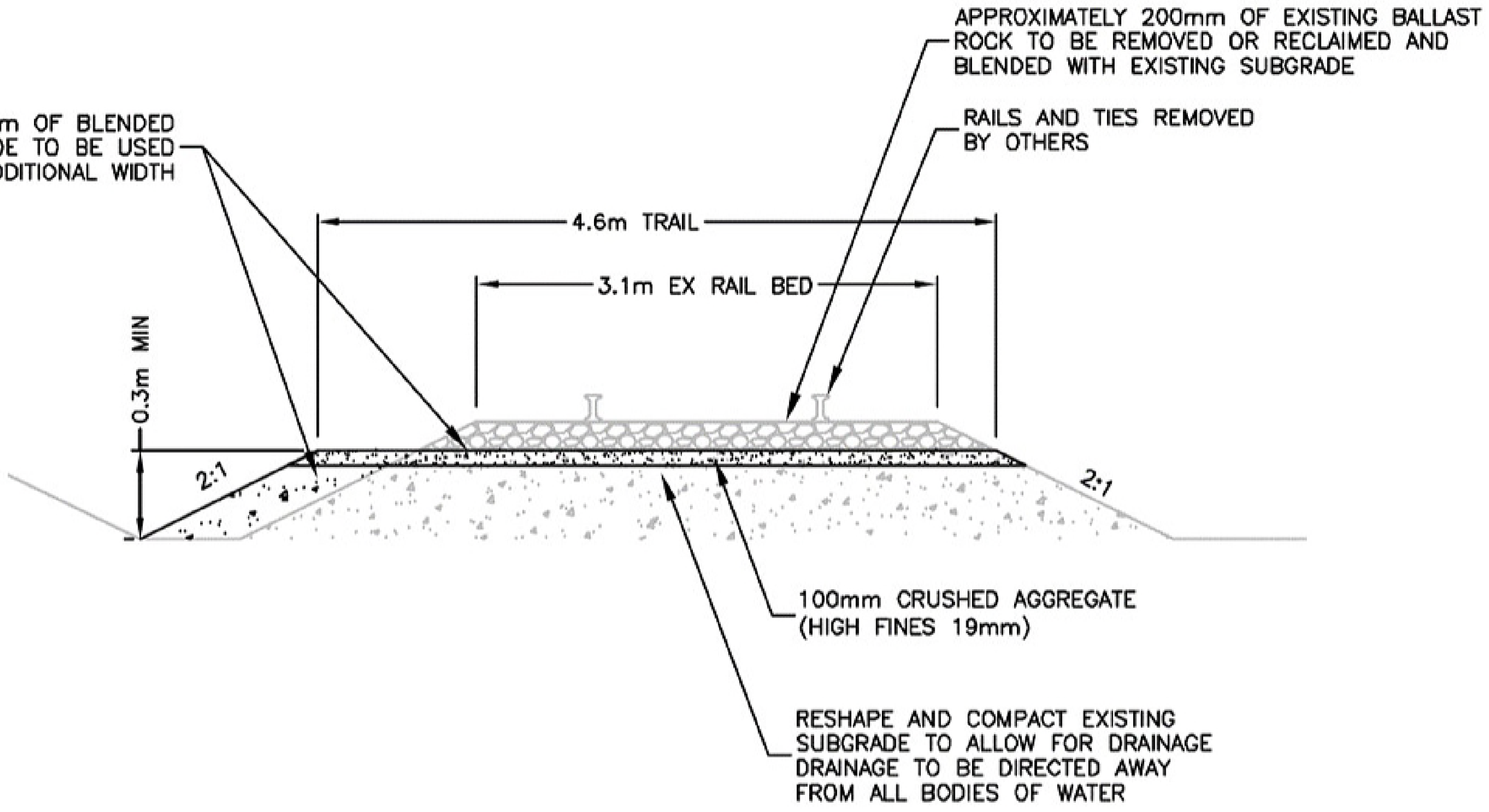
QC Qualifiers:

SPK1	The recovery of this analyte was outside of established control limits. The data was accepted based on performance of other batch QC.


OBS WELL 356 - WINFIELD (JIM BAILEY RD.)
1/1/2005
1/1/2010
1/1/2015
Water level below ground surface in metres
2
4
6
8
10

APPENDIX C
PROPOSED RECREATIONAL TRAIL


APPROXIMATELY 200mm OF EXISTING BALLAST
ROCK TO BE REMOVED OR RECLAIMED AND
BLENDED WITH EXISTING SUBGRADE
RAILS AND TIES REMOVED
BY OTHERS
APPROXIMATELY 300mm OF BLENDED
BALLAST AND SUBGRADE TO BE USED
TO BUILD ADDITIONAL WIDTH
4.6m TRAIL
3.1m EX RAIL BED
0.3m MIN
2:1
2:1
100mm CRUSHED AGGREGATE
(HIGH FINES 19mm)
RESHAPE AND COMPACT EXISTING
SUBGRADE TO ALLOW FOR DRAINAGE
DRAINAGE TO BE DIRECTED AWAY
FROM ALL BODIES OF WATER

APPENDIX D
PROUCL OUTPUT

1	**UCL Statistics for Data Sets with Non-Detects**											
2												
3	User Selected Options											
4	Date/Time of Computation	ProUCL 5.16/13/2018 1:57:36 PM										
5	From File	WorkSheet.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	mber of Bootstrap Operations	2000										
9												
10	**BaP**											
11												
12	**General Statistics**											
13	Total Number of Observations	182					Number of Distinct Observations	60				
14	Number of Detects	73					Number of Non-Detects	109				
15	Number of Distinct Detects	60					Number of Distinct Non-Detects	1				
16	Minimum Detect	0.01					Minimum Non-Detect	0.01				
17	Maximum Detect	1.3					Maximum Non-Detect	0.01				
18	Variance Detects	0.128					Percent Non-Detects	59.89%				
19	Mean Detects	0.288					SD Detects	0.358				
20	Median Detects	0.11					CV Detects	1.243				
21	Skewness Detects	1.57					Kurtosis Detects	1.401				
22	Mean of Logged Detects	-2.076					SD of Logged Detects	1.398				
23												
24	**Normal GOF Test on Detects Only**											
25	Shapiro Wilk Test Statistic	0.735					**Normal GOF Test on Detected Observations Only**					
26	5% Shapiro Wilk P Value	0					Detected Data Not Normal at 5% Significance Level					
27	Lilliefors Test Statistic	0.237					**Lilliefors GOF Test**					
28	5% Lilliefors Critical Value	0.104					Detected Data Not Normal at 5% Significance Level					
29	**Detected Data Not Normal at 5% Significance Level**											
30												
31	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
32	KM Mean	0.122					KM Standard Error of Mean	0.0196				
33	KM SD	0.263					95% KM (BCA) UCL	0.157				
34	95% KM (t) UCL	0.154					95% KM (Percentile Bootstrap) UCL	0.156				
35	95% KM (z) UCL	0.154					95% KM Bootstrap t UCL	0.163				
36	90% KM Chebyshev UCL	0.18					95% KM Chebyshev UCL	0.207				
37	97.5% KM Chebyshev UCL	0.244					99% KM Chebyshev UCL	0.317				
38												
39	**Gamma GOF Tests on Detected Observations Only**											
40	A-D Test Statistic	1.423					**Anderson-Darling GOF Test**					
41	5% A-D Critical Value	0.795					Detected Data Not Gamma Distributed at 5% Significance Level					
42	K-S Test Statistic	0.125					**Kolmogorov-Smirnov GOF**					
43	5% K-S Critical Value	0.109					Detected Data Not Gamma Distributed at 5% Significance Level					
44	**Detected Data Not Gamma Distributed at 5% Significance Level**											
45												
46	**Gamma Statistics on Detected Data Only**											
47	k hat (MLE)	0.723					k star (bias corrected MLE)	0.703				
48	Theta hat (MLE)	0.398					Theta star (bias corrected MLE)	0.41				
49	nu hat (MLE)	105.6					nu star (bias corrected)	102.6				
50	Mean (detects)	0.288										
51												
52	**Gamma ROS Statistics using Imputed Non-Detects**											
53	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
54	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
55	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
56	This is especially true when the sample size is small.											
57	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
58	Minimum	0.01					Mean	0.122				
59	Maximum	1.3					Median	0.01				
60	SD	0.264					CV	2.172				
61	k hat (MLE)	0.437					k star (bias corrected MLE)	0.434				
62	Theta hat (MLE)	0.278					Theta star (bias corrected MLE)	0.28				
63	nu hat (MLE)	159.2					nu star (bias corrected)	157.9				
64	Adjusted Level of Significance (β)	0.0487										
65	Approximate Chi Square Value (157.92, α)	129.9					Adjusted Chi Square Value (157.92, β)	129.7				

66	95% Gamma Approximate UCL (use when n>=50)					0.148	95% Gamma Adjusted UCL (use when n<50)					0.148
67												
68	**Estimates of Gamma Parameters using KM Estimates**											
69	Mean (KM)					0.122	SD (KM)					0.263
70	Variance (KM)					0.0693	SE of Mean (KM)					0.0196
71	k hat (KM)					0.213	k star (KM)					0.213
72	nu hat (KM)					77.56	nu star (KM)					77.62
73	theta hat (KM)					0.57	theta star (KM)					0.57
74	80% gamma percentile (KM)					0.165	90% gamma percentile (KM)					0.367
75	95% gamma percentile (KM)					0.615	99% gamma percentile (KM)					1.292
76												
77	**Gamma Kaplan-Meier (KM) Statistics**											
78	Approximate Chi Square Value (77.62, α)					58.32	Adjusted Chi Square Value (77.62, β)					58.19
79	5% Gamma Approximate KM-UCL (use when n>=50)					0.162	95% Gamma Adjusted KM-UCL (use when n<50)					0.162
80												
81	**Lognormal GOF Test on Detected Observations Only**											
82	Shapiro Wilk Approximate Test Statistic					0.943	**Shapiro Wilk GOF Test**					
83	5% Shapiro Wilk P Value					0.00451	Detected Data Not Lognormal at 5% Significance Level					
84	Lilliefors Test Statistic					0.0734	**Lilliefors GOF Test**					
85	5% Lilliefors Critical Value					0.104	Detected Data appear Lognormal at 5% Significance Level					
86	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
87												
88	**Lognormal ROS Statistics Using Imputed Non-Detects**											
89	Mean in Original Scale					0.119	Mean in Log Scale					-4.462
90	SD in Original Scale					0.265	SD in Log Scale					2.468
91	95% t UCL (assumes normality of ROS data)					0.151	95% Percentile Bootstrap UCL					0.154
92	95% BCA Bootstrap UCL					0.158	95% Bootstrap t UCL					0.156
93	95% H-UCL (Log ROS)					0.484						
94												
95	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
96	KM Mean (logged)					-3.591	KM Geo Mean					0.0276
97	KM SD (logged)					1.52	95% Critical H Value (KM-Log)					2.672
98	KM Standard Error of Mean (logged)					0.113	95% H-UCL (KM -Log)					0.118
99	KM SD (logged)					1.52	95% Critical H Value (KM-Log)					2.672
100	KM Standard Error of Mean (logged)					0.113						
101												
102	**DL/2 Statistics**											
103	**DL/2 Normal**						**DL/2 Log-Transformed**					
104	Mean in Original Scale					0.119	Mean in Log Scale					-4.006
105	SD in Original Scale					0.265	SD in Log Scale					1.812
106	95% t UCL (Assumes normality)					0.151	95% H-Stat UCL					0.141
107	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
108												
109	**Nonparametric Distribution Free UCL Statistics**											
110	**Detected Data appear Approximate Lognormal Distributed at 5% Significance Level**											
111												
112	**Suggested UCL to Use**											
113	KM H-UCL					0.118						
114												
115	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
116	Recommendations are based upon data size, data distribution, and skewness.											
117	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
118	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician											
119												
120	**BbF**											
121												
122	**General Statistics**											
123	Total Number of Observations					182	Number of Distinct Observations					79
124	Number of Detects					85	Number of Non-Detects					97
125	Number of Distinct Detects					79	Number of Distinct Non-Detects					1
126	Minimum Detect					0.01	Minimum Non-Detect					0.01
127	Maximum Detect					2.52	Maximum Non-Detect					0.01
128	Variance Detects					0.322	Percent Non-Detects					53.3%
129	Mean Detects					0.452	SD Detects					0.568
130	Median Detects					0.212	CV Detects					1.255

131	Skewness Detects					1.742	Kurtosis Detects					2.485
132	Mean of Logged Detects					-1.704	SD of Logged Detects					1.537
133												
134	**Normal GOF Test on Detects Only**											
135	Shapiro Wilk Test Statistic					0.754	**Normal GOF Test on Detected Observations Only**					
136	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
137	Lilliefors Test Statistic					0.218	**Lilliefors GOF Test**					
138	5% Lilliefors Critical Value					0.0962	Detected Data Not Normal at 5% Significance Level					
139	**Detected Data Not Normal at 5% Significance Level**											
140												
141	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
142	KM Mean					0.217	KM Standard Error of Mean					0.0331
143	KM SD					0.444	95% KM (BCA) UCL					0.269
144	95% KM (t) UCL					0.271	95% KM (Percentile Bootstrap) UCL					0.272
145	95% KM (z) UCL					0.271	95% KM Bootstrap t UCL					0.281
146	90% KM Chebyshev UCL					0.316	95% KM Chebyshev UCL					0.361
147	97.5% KM Chebyshev UCL					0.424	99% KM Chebyshev UCL					0.546
148												
149	**Gamma GOF Tests on Detected Observations Only**											
150	A-D Test Statistic					0.796	**Anderson-Darling GOF Test**					
151	5% A-D Critical Value					0.802	Detected data appear Gamma Distributed at 5% Significance Leve					
152	K-S Test Statistic					0.073	**Kolmogorov-Smirnov GOF**					
153	5% K-S Critical Value					0.101	Detected data appear Gamma Distributed at 5% Significance Leve					
154	**Detected data appear Gamma Distributed at 5% Significance Level**											
155												
156	**Gamma Statistics on Detected Data Only**											
157	k hat (MLE)					0.668	k star (bias corrected MLE)					0.652
158	Theta hat (MLE)					0.677	Theta star (bias corrected MLE)					0.694
159	nu hat (MLE)					113.5	nu star (bias corrected)					110.9
160	Mean (detects)					0.452						
161												
162	**Gamma ROS Statistics using Imputed Non-Detects**											
163	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
164	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
165	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
166	This is especially true when the sample size is small.											
167	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
168	Minimum					0.01	Mean					0.217
169	Maximum					2.52	Median					0.01
170	SD					0.446	CV					2.057
171	k hat (MLE)					0.385	k star (bias corrected MLE)					0.382
172	Theta hat (MLE)					0.563	Theta star (bias corrected MLE)					0.567
173	nu hat (MLE)					140.1	nu star (bias corrected)					139.1
174	Adjusted Level of Significance (β)					0.0487						
175	Approximate Chi Square Value (139.11, α)					112.9	Adjusted Chi Square Value (139.11, β)					112.7
176	95% Gamma Approximate UCL (use when n>=50)					0.267	95% Gamma Adjusted UCL (use when n<50)					0.267
177												
178	**Estimates of Gamma Parameters using KM Estimates**											
179	Mean (KM)					0.217	SD (KM)					0.444
180	Variance (KM)					0.197	SE of Mean (KM)					0.0331
181	k hat (KM)					0.238	k star (KM)					0.237
182	nu hat (KM)					86.51	nu star (KM)					86.42
183	theta hat (KM)					0.911	theta star (KM)					0.912
184	80% gamma percentile (KM)					0.309	90% gamma percentile (KM)					0.652
185	95% gamma percentile (KM)					1.065	99% gamma percentile (KM)					2.17
186												
187	**Gamma Kaplan-Meier (KM) Statistics**											
188	Approximate Chi Square Value (86.42, α)					65.99	Adjusted Chi Square Value (86.42, β)					65.85
189	5% Gamma Approximate KM-UCL (use when n>=50)					0.284	95% Gamma Adjusted KM-UCL (use when n<50)					0.284
190												
191	**Lognormal GOF Test on Detected Observations Only**											
192	Shapiro Wilk Approximate Test Statistic					0.94	**Shapiro Wilk GOF Test**					
193	5% Shapiro Wilk P Value					0.00106	Detected Data Not Lognormal at 5% Significance Level					
194	Lilliefors Test Statistic					0.0785	**Lilliefors GOF Test**					
195	5% Lilliefors Critical Value					0.0962	Detected Data appear Lognormal at 5% Significance Level					

196	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
197												
198	**Lognormal ROS Statistics Using Imputed Non-Detects**											
199						Mean in Original Scale	0.215			Mean in Log Scale	-3.858	
200						SD in Original Scale	0.446			SD in Log Scale	2.534	
201					95% t UCL (assumes normality of ROS data)		0.27			95% Percentile Bootstrap UCL	0.272	
202						95% BCA Bootstrap UCL	0.282			95% Bootstrap t UCL	0.281	
203						95% H-UCL (Log ROS)	1.08					
204												
205	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
206						KM Mean (logged)	-3.25			KM Geo Mean	0.0388	
207						KM SD (logged)	1.785			95% Critical H Value (KM-Log)	2.963	
208						KM Standard Error of Mean (logged)	0.133			95% H-UCL (KM -Log)	0.282	
209						KM SD (logged)	1.785			95% Critical H Value (KM-Log)	2.963	
210						KM Standard Error of Mean (logged)	0.133					
211												
212	**DL/2 Statistics**											
213	**DL/2 Normal**									**DL/2 Log-Transformed**		
214						Mean in Original Scale	0.214			Mean in Log Scale	-3.62	
215						SD in Original Scale	0.447			SD in Log Scale	2.081	
216						95% t UCL (Assumes normality)	0.269			95% H-Stat UCL	0.389	
217	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
218												
219	**Nonparametric Distribution Free UCL Statistics**											
220	**Detected Data appear Gamma Distributed at 5% Significance Level**											
221												
222	**Suggested UCL to Use**											
223						95% KM Approximate Gamma UCL	0.284					
224												
225	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
226	Recommendations are based upon data size, data distribution, and skewness.											
227	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
228	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician											
229												
230	**BghiP**											
231												
232	**General Statistics**											
233						Total Number of Observations	182			Number of Distinct Observations	74	
234						Number of Detects	76			Number of Non-Detects	106	
235						Number of Distinct Detects	73			Number of Distinct Non-Detects	2	
236						Minimum Detect	0.021			Minimum Non-Detect	0.02	
237						Maximum Detect	16.2			Maximum Non-Detect	0.021	
238						Variance Detects	8.358			Percent Non-Detects	58.24%	
239						Mean Detects	1.765			SD Detects	2.891	
240						Median Detects	0.572			CV Detects	1.638	
241						Skewness Detects	3.376			Kurtosis Detects	14	
242						Mean of Logged Detects	-0.621			SD of Logged Detects	1.746	
243												
244	**Normal GOF Test on Detects Only**											
245						Shapiro Wilk Test Statistic	0.61			**Normal GOF Test on Detected Observations Only**		
246						5% Shapiro Wilk P Value	0			Detected Data Not Normal at 5% Significance Level		
247						Lilliefors Test Statistic	0.273			**Lilliefors GOF Test**		
248						5% Lilliefors Critical Value	0.102			Detected Data Not Normal at 5% Significance Level		
249	**Detected Data Not Normal at 5% Significance Level**											
250												
251	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
252						KM Mean	0.749			KM Standard Error of Mean	0.153	
253						KM SD	2.046			95% KM (BCA) UCL	1.037	
254						95% KM (t) UCL	1.001			95% KM (Percentile Bootstrap) UCL	1.02	
255						95% KM (z) UCL	1			95% KM Bootstrap t UCL	1.096	
256						90% KM Chebyshev UCL	1.207			95% KM Chebyshev UCL	1.414	
257						97.5% KM Chebyshev UCL	1.702			99% KM Chebyshev UCL	2.268	
258												
259	**Gamma GOF Tests on Detected Observations Only**											
260						A-D Test Statistic	1.058			**Anderson-Darling GOF Test**		

261				5% A-D Critical Value		0.815	Detected Data Not Gamma Distributed at 5% Significance Level					
262				K-S Test Statistic		0.114	**Kolmogorov-Smirnov GOF**					
263				5% K-S Critical Value		0.108	Detected Data Not Gamma Distributed at 5% Significance Level					
264	**Detected Data Not Gamma Distributed at 5% Significance Level**											
265												
266	**Gamma Statistics on Detected Data Only**											
267				k hat (MLE)		0.53	k star (bias corrected MLE)					0.517
268				Theta hat (MLE)		3.334	Theta star (bias corrected MLE)					3.412
269				nu hat (MLE)		80.49	nu star (bias corrected)					78.64
270				Mean (detects)		1.765						
271												
272	**Gamma ROS Statistics using Imputed Non-Detects**											
273	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
274	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
275	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
276	This is especially true when the sample size is small.											
277	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
278				Minimum		0.01	Mean					0.743
279				Maximum		16.2	Median					0.01
280				SD		2.053	CV					2.764
281				k hat (MLE)		0.266	k star (bias corrected MLE)					0.265
282				Theta hat (MLE)		2.794	Theta star (bias corrected MLE)					2.801
283				nu hat (MLE)		96.8	nu star (bias corrected)					96.54
284				Adjusted Level of Significance (β)		0.0487						
285				Approximate Chi Square Value (96.54, α)		74.88	Adjusted Chi Square Value (96.54, β)					74.73
286				95% Gamma Approximate UCL (use when n>=50)		0.958	95% Gamma Adjusted UCL (use when n<50)					0.96
287												
288	**Estimates of Gamma Parameters using KM Estimates**											
289				Mean (KM)		0.749	SD (KM)					2.046
290				Variance (KM)		4.185	SE of Mean (KM)					0.153
291				k hat (KM)		0.134	k star (KM)					0.135
292				nu hat (KM)		48.77	nu star (KM)					49.3
293				theta hat (KM)		5.589	theta star (KM)					5.529
294				80% gamma percentile (KM)		0.745	90% gamma percentile (KM)					2.183
295				95% gamma percentile (KM)		4.198	99% gamma percentile (KM)					10.17
296												
297	**Gamma Kaplan-Meier (KM) Statistics**											
298				Approximate Chi Square Value (49.30, α)		34.18	Adjusted Chi Square Value (49.30, β)					34.08
299	5% Gamma Approximate KM-UCL (use when n>=50)					1.08	95% Gamma Adjusted KM-UCL (use when n<50)					1.083
300												
301	**Lognormal GOF Test on Detected Observations Only**											
302				Shapiro Wilk Approximate Test Statistic		0.947	**Shapiro Wilk GOF Test**					
303				5% Shapiro Wilk P Value		0.00745	Detected Data Not Lognormal at 5% Significance Level					
304				Lilliefors Test Statistic		0.0795	**Lilliefors GOF Test**					
305				5% Lilliefors Critical Value		0.102	Detected Data appear Lognormal at 5% Significance Level					
306	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
307												
308	**Lognormal ROS Statistics Using Imputed Non-Detects**											
309				Mean in Original Scale		0.744	Mean in Log Scale					-3.444
310				SD in Original Scale		2.053	SD in Log Scale					3.013
311				95% t UCL (assumes normality of ROS data)		0.996	95% Percentile Bootstrap UCL					1.007
312				95% BCA Bootstrap UCL		1.082	95% Bootstrap t UCL					1.095
313				95% H-UCL (Log ROS)		8.109						
314												
315	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
316				KM Mean (logged)		-2.538	KM Geo Mean					0.0791
317				KM SD (logged)		1.972	95% Critical H Value (KM-Log)					3.177
318				KM Standard Error of Mean (logged)		0.147	95% H-UCL (KM -Log)					0.881
319				KM SD (logged)		1.972	95% Critical H Value (KM-Log)					3.177
320				KM Standard Error of Mean (logged)		0.147						
321												
322	**DL/2 Statistics**											
323	**DL/2 Normal**						**DL/2 Log-Transformed**					
324				Mean in Original Scale		0.743	Mean in Log Scale					-2.941
325				SD in Original Scale		2.053	SD in Log Scale					2.268

	A	B	C	D	E	F	G	H	I	J	K	L
326					95% t UCL (Assumes normality)	0.995					95% H-Stat UCL	1.253
327	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
328												
329	**Nonparametric Distribution Free UCL Statistics**											
330	**Detected Data appear Approximate Lognormal Distributed at 5% Significance Level**											
331												
332	**Suggested UCL to Use**											
333					KM H-UCL	0.881						
334												
335	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
336	Recommendations are based upon data size, data distribution, and skewness.											
337	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
338	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician											
339												
340	**BkF**											
341												
342	**General Statistics**											
343					Total Number of Observations	182					Number of Distinct Observations	66
344					Number of Detects	68					Number of Non-Detects	114
345					Number of Distinct Detects	64					Number of Distinct Non-Detects	2
346					Minimum Detect	0.011					Minimum Non-Detect	0.01
347					Maximum Detect	1.14					Maximum Non-Detect	0.4
348					Variance Detects	0.0658					Percent Non-Detects	62.64%
349					Mean Detects	0.234					SD Detects	0.256
350					Median Detects	0.129					CV Detects	1.097
351					Skewness Detects	1.644					Kurtosis Detects	2.198
352					Mean of Logged Detects	-2.052					SD of Logged Detects	1.172
353												
354	**Normal GOF Test on Detects Only**											
355					Shapiro Wilk Test Statistic	0.783	**Normal GOF Test on Detected Observations Only**					
356					5% Shapiro Wilk P Value	1.543E-13	Detected Data Not Normal at 5% Significance Level					
357					Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**					
358					5% Lilliefors Critical Value	0.107	Detected Data Not Normal at 5% Significance Level					
359	**Detected Data Not Normal at 5% Significance Level**											
360												
361	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
362					KM Mean	0.0938					KM Standard Error of Mean	0.0142
363					KM SD	0.19					95% KM (BCA) UCL	0.119
364					95% KM (t) UCL	0.117					95% KM (Percentile Bootstrap) UCL	0.118
365					95% KM (z) UCL	0.117					95% KM Bootstrap t UCL	0.123
366					90% KM Chebyshev UCL	0.136					95% KM Chebyshev UCL	0.156
367					97.5% KM Chebyshev UCL	0.182					99% KM Chebyshev UCL	0.235
368												
369	**Gamma GOF Tests on Detected Observations Only**											
370					A-D Test Statistic	0.793	**Anderson-Darling GOF Test**					
371					5% A-D Critical Value	0.782	Detected Data Not Gamma Distributed at 5% Significance Level					
372					K-S Test Statistic	0.103	**Kolmogorov-Smirnov GOF**					
373					5% K-S Critical Value	0.111	Detected data appear Gamma Distributed at 5% Significance Leve					
374	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
375												
376	**Gamma Statistics on Detected Data Only**											
377					k hat (MLE)	0.967					k star (bias corrected MLE)	0.934
378					Theta hat (MLE)	0.242					Theta star (bias corrected MLE)	0.25
379					nu hat (MLE)	131.5					nu star (bias corrected)	127.1
380					Mean (detects)	0.234						
381												
382	**Gamma ROS Statistics using Imputed Non-Detects**											
383	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
384	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
385	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
386	This is especially true when the sample size is small.											
387	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
388					Minimum	0.01					Mean	0.0936
389					Maximum	1.14					Median	0.01
390					SD	0.19					CV	2.03

391					k hat (MLE)	0.496			k star (bias corrected MLE)			0.491
392					Theta hat (MLE)	0.189			Theta star (bias corrected MLE)			0.191
393					nu hat (MLE)	180.5			nu star (bias corrected)			178.8
394					Adjusted Level of Significance (β)	0.0487						
395					Approximate Chi Square Value (178.81, α)	148.9			Adjusted Chi Square Value (178.81, β)			148.7
396					95% Gamma Approximate UCL (use when n>=50)	0.112			95% Gamma Adjusted UCL (use when n<50)			0.113
397												
398					**Estimates of Gamma Parameters using KM Estimates**							
399					Mean (KM)	0.0938			SD (KM)			0.19
400					Variance (KM)	0.0359			SE of Mean (KM)			0.0142
401					k hat (KM)	0.245			k star (KM)			0.245
402					nu hat (KM)	89.16			nu star (KM)			89.02
403					theta hat (KM)	0.383			theta star (KM)			0.384
404					80% gamma percentile (KM)	0.135			90% gamma percentile (KM)			0.282
405					95% gamma percentile (KM)	0.457			99% gamma percentile (KM)			0.925
406												
407					**Gamma Kaplan-Meier (KM) Statistics**							
408					Approximate Chi Square Value (89.02, α)	68.27			Adjusted Chi Square Value (89.02, β)			68.12
409					5% Gamma Approximate KM-UCL (use when n>=50)	0.122			95% Gamma Adjusted KM-UCL (use when n<50)			0.123
410												
411					**Lognormal GOF Test on Detected Observations Only**							
412					Shapiro Wilk Approximate Test Statistic	0.965			**Shapiro Wilk GOF Test**			
413					5% Shapiro Wilk P Value	0.152			Detected Data appear Lognormal at 5% Significance Level			
414					Lilliefors Test Statistic	0.0516			**Lilliefors GOF Test**			
415					5% Lilliefors Critical Value	0.107			Detected Data appear Lognormal at 5% Significance Level			
416					**Detected Data appear Lognormal at 5% Significance Level**							
417												
418					**Lognormal ROS Statistics Using Imputed Non-Detects**							
419					Mean in Original Scale	0.0926			Mean in Log Scale			-4.16
420					SD in Original Scale	0.191			SD in Log Scale			2.076
421					95% t UCL (assumes normality of ROS data)	0.116			95% Percentile Bootstrap UCL			0.117
422					95% BCA Bootstrap UCL	0.12			95% Bootstrap t UCL			0.12
423					95% H-UCL (Log ROS)	0.224						
424												
425					**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**							
426					KM Mean (logged)	-3.648			KM Geo Mean			0.0261
427					KM SD (logged)	1.426			95% Critical H Value (KM-Log)			2.574
428					KM Standard Error of Mean (logged)	0.107			95% H-UCL (KM -Log)			0.0946
429					KM SD (logged)	1.426			95% Critical H Value (KM-Log)			2.574
430					KM Standard Error of Mean (logged)	0.107						
431												
432					**DL/2 Statistics**							
433					**DL/2 Normal**				**DL/2 Log-Transformed**			
434					Mean in Original Scale	0.0916			Mean in Log Scale			-4.065
435					SD in Original Scale	0.192			SD in Log Scale			1.736
436					95% t UCL (Assumes normality)	0.115			95% H-Stat UCL			0.113
437					**DL/2 is not a recommended method, provided for comparisons and historical reasons**							
438												
439					**Nonparametric Distribution Free UCL Statistics**							
440					**Detected Data appear Approximate Gamma Distributed at 5% Significance Level**							
441												
442					**Suggested UCL to Use**							
443					95% KM Approximate Gamma UCL	0.122						
444												
445					When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test							
446					When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL							
447												
448					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
449					Recommendations are based upon data size, data distribution, and skewness.							
450					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
451					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician							
452												
453	**Indeno**											
454												
455					**General Statistics**							

456	Total Number of Observations					182	Number of Distinct Observations					67
457	Number of Detects					70	Number of Non-Detects					112
458	Number of Distinct Detects					66	Number of Distinct Non-Detects					2
459	Minimum Detect					0.021	Minimum Non-Detect					0.02
460	Maximum Detect					3.54	Maximum Non-Detect					0.021
461	Variance Detects					0.611	Percent Non-Detects					61.54%
462	Mean Detects					0.64	SD Detects					0.782
463	Median Detects					0.264	CV Detects					1.222
464	Skewness Detects					1.719	Kurtosis Detects					2.675
465	Mean of Logged Detects					-1.271	SD of Logged Detects					1.422
466												
467	**Normal GOF Test on Detects Only**											
468	Shapiro Wilk Test Statistic					0.765	**Normal GOF Test on Detected Observations Only**					
469	5% Shapiro Wilk P Value					3.109E-15	Detected Data Not Normal at 5% Significance Level					
470	Lilliefors Test Statistic					0.219	**Lilliefors GOF Test**					
471	5% Lilliefors Critical Value					0.106	Detected Data Not Normal at 5% Significance Level					
472	**Detected Data Not Normal at 5% Significance Level**											
473												
474	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
475	KM Mean					0.258	KM Standard Error of Mean					0.0424
476	KM SD					0.568	95% KM (BCA) UCL					0.333
477	95% KM (t) UCL					0.329	95% KM (Percentile Bootstrap) UCL					0.33
478	95% KM (z) UCL					0.328	95% KM Bootstrap t UCL					0.345
479	90% KM Chebyshev UCL					0.386	95% KM Chebyshev UCL					0.443
480	97.5% KM Chebyshev UCL					0.523	99% KM Chebyshev UCL					0.68
481												
482	**Gamma GOF Tests on Detected Observations Only**											
483	A-D Test Statistic					0.947	**Anderson-Darling GOF Test**					
484	5% A-D Critical Value					0.795	Detected Data Not Gamma Distributed at 5% Significance Level					
485	K-S Test Statistic					0.11	**Kolmogorov-Smirnov GOF**					
486	5% K-S Critical Value					0.111	)etected data appear Gamma Distributed at 5% Significance Leve					
487	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
488												
489	**Gamma Statistics on Detected Data Only**											
490	k hat (MLE)					0.729	k star (bias corrected MLE)					0.707
491	Theta hat (MLE)					0.878	Theta star (bias corrected MLE)					0.905
492	nu hat (MLE)					102	nu star (bias corrected)					98.96
493	Mean (detects)					0.64						
494												
495	**Gamma ROS Statistics using Imputed Non-Detects**											
496	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
497	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
498	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
499	This is especially true when the sample size is small.											
500	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
501	Minimum					0.01	Mean					0.252
502	Maximum					3.54	Median					0.01
503	SD					0.572	CV					2.268
504	k hat (MLE)					0.346	k star (bias corrected MLE)					0.344
505	Theta hat (MLE)					0.729	Theta star (bias corrected MLE)					0.733
506	nu hat (MLE)					126	nu star (bias corrected)					125.3
507	Adjusted Level of Significance (β)					0.0487						
508	Approximate Chi Square Value (125.28, α)					100.4	Adjusted Chi Square Value (125.28, β)					100.3
509	95% Gamma Approximate UCL (use when n>=50)					0.315	95% Gamma Adjusted UCL (use when n<50)					0.315
510												
511	**Estimates of Gamma Parameters using KM Estimates**											
512	Mean (KM)					0.258	SD (KM)					0.568
513	Variance (KM)					0.323	SE of Mean (KM)					0.0424
514	k hat (KM)					0.207	k star (KM)					0.207
515	nu hat (KM)					75.34	nu star (KM)					75.43
516	theta hat (KM)					1.249	theta star (KM)					1.247
517	80% gamma percentile (KM)					0.347	90% gamma percentile (KM)					0.782
518	95% gamma percentile (KM)					1.319	99% gamma percentile (KM)					2.791
519												
520	**Gamma Kaplan-Meier (KM) Statistics**											

521	Approximate Chi Square Value (75.43, α)					56.42	Adjusted Chi Square Value (75.43, β)					56.29
522	5% Gamma Approximate KM-UCL (use when n>=50)					0.345	95% Gamma Adjusted KM-UCL (use when n<50)					0.346
523												
524	**Lognormal GOF Test on Detected Observations Only**											
525	Shapiro Wilk Approximate Test Statistic					0.945	**Shapiro Wilk GOF Test**					
526	5% Shapiro Wilk P Value					0.00801	Detected Data Not Lognormal at 5% Significance Level					
527	Lilliefors Test Statistic					0.0842	**Lilliefors GOF Test**					
528	5% Lilliefors Critical Value					0.106	Detected Data appear Lognormal at 5% Significance Level					
529	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
530												
531	**Lognormal ROS Statistics Using Imputed Non-Detects**											
532	Mean in Original Scale					0.253	Mean in Log Scale					-3.786
533	SD in Original Scale					0.572	SD in Log Scale					2.524
534	95% t UCL (assumes normality of ROS data)					0.323	95% Percentile Bootstrap UCL					0.33
535	95% BCA Bootstrap UCL					0.335	95% Bootstrap t UCL					0.335
536	95% H-UCL (Log ROS)					1.126						
537												
538	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
539	KM Mean (logged)					-2.896	KM Geo Mean					0.0552
540	KM SD (logged)					1.555	95% Critical H Value (KM-Log)					2.71
541	KM Standard Error of Mean (logged)					0.116	95% H-UCL (KM -Log)					0.253
542	KM SD (logged)					1.555	95% Critical H Value (KM-Log)					2.71
543	KM Standard Error of Mean (logged)					0.116						
544												
545	**DL/2 Statistics**											
546	**DL/2 Normal**						**DL/2 Log-Transformed**					
547	Mean in Original Scale					0.252	Mean in Log Scale					-3.323
548	SD in Original Scale					0.572	SD in Log Scale					1.848
549	95% t UCL (Assumes normality)					0.322	95% H-Stat UCL					0.302
550	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
551												
552	**Nonparametric Distribution Free UCL Statistics**											
553	**Detected Data appear Approximate Gamma Distributed at 5% Significance Level**											
554												
555	**Suggested UCL to Use**											
556	95% KM Approximate Gamma UCL					0.345						
557												
558	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test											
559	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL											
560												
561	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
562	Recommendations are based upon data size, data distribution, and skewness.											
563	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
564	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician											
565												
566	**Naph**											
567												
568	**General Statistics**											
569	Total Number of Observations					182	Number of Distinct Observations					20
570	Number of Detects					36	Number of Non-Detects					146
571	Number of Distinct Detects					20	Number of Distinct Non-Detects					1
572	Minimum Detect					0.01	Minimum Non-Detect					0.01
573	Maximum Detect					0.271	Maximum Non-Detect					0.01
574	Variance Detects					0.00182	Percent Non-Detects					80.22%
575	Mean Detects					0.0317	SD Detects					0.0427
576	Median Detects					0.021	CV Detects					1.346
577	Skewness Detects					5.307	Kurtosis Detects					30.2
578	Mean of Logged Detects					-3.726	SD of Logged Detects					0.608
579												
580	**Normal GOF Test on Detects Only**											
581	Shapiro Wilk Test Statistic					0.393	**Shapiro Wilk GOF Test**					
582	5% Shapiro Wilk Critical Value					0.935	Detected Data Not Normal at 5% Significance Level					
583	Lilliefors Test Statistic					0.313	**Lilliefors GOF Test**					
584	5% Lilliefors Critical Value					0.145	Detected Data Not Normal at 5% Significance Level					
585	**Detected Data Not Normal at 5% Significance Level**											

586												
587	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
588					KM Mean	0.0143			KM Standard Error of Mean			0.00155
589					KM SD	0.0206			95% KM (BCA) UCL			0.0176
590					95% KM (t) UCL	0.0169			95% KM (Percentile Bootstrap) UCL			0.0171
591					95% KM (z) UCL	0.0168			95% KM Bootstrap t UCL			0.0204
592					90% KM Chebyshev UCL	0.0189			95% KM Chebyshev UCL			0.0211
593					97.5% KM Chebyshev UCL	0.024			99% KM Chebyshev UCL			0.0297
594												
595	**Gamma GOF Tests on Detected Observations Only**											
596					A-D Test Statistic	2.62	**Anderson-Darling GOF Test**					
597					5% A-D Critical Value	0.76	Detected Data Not Gamma Distributed at 5% Significance Level					
598					K-S Test Statistic	0.19	**Kolmogorov-Smirnov GOF**					
599					5% K-S Critical Value	0.149	Detected Data Not Gamma Distributed at 5% Significance Level					
600	**Detected Data Not Gamma Distributed at 5% Significance Level**											
601												
602	**Gamma Statistics on Detected Data Only**											
603					k hat (MLE)	1.968			k star (bias corrected MLE)			1.822
604					Theta hat (MLE)	0.0161			Theta star (bias corrected MLE)			0.0174
605					nu hat (MLE)	141.7			nu star (bias corrected)			131.2
606					Mean (detects)	0.0317						
607												
608	**Gamma ROS Statistics using Imputed Non-Detects**											
609	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
610	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
611	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
612	This is especially true when the sample size is small.											
613	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
614					Minimum	0.01			Mean			0.0143
615					Maximum	0.271			Median			0.01
616					SD	0.0207			CV			1.447
617					k hat (MLE)	2.88			k star (bias corrected MLE)			2.837
618					Theta hat (MLE)	0.00496			Theta star (bias corrected MLE)			0.00504
619					nu hat (MLE)	1048			nu star (bias corrected)			1032
620					Adjusted Level of Significance (β)	0.0487						
621					Approximate Chi Square Value (N/A, α)	958.9			Adjusted Chi Square Value (N/A, β)			958.3
622					95% Gamma Approximate UCL (use when n>=50)	0.0154			95% Gamma Adjusted UCL (use when n<50)			0.0154
623												
624	**Estimates of Gamma Parameters using KM Estimates**											
625					Mean (KM)	0.0143			SD (KM)			0.0206
626					Variance (KM)	4.2547E-4			SE of Mean (KM)			0.00155
627					k hat (KM)	0.48			k star (KM)			0.476
628					nu hat (KM)	174.9			nu star (KM)			173.3
629					theta hat (KM)	0.0298			theta star (KM)			0.03
630					80% gamma percentile (KM)	0.0234			90% gamma percentile (KM)			0.0391
631					95% gamma percentile (KM)	0.0559			99% gamma percentile (KM)			0.0974
632												
633	**Gamma Kaplan-Meier (KM) Statistics**											
634					Approximate Chi Square Value (173.32, α)	143.9			Adjusted Chi Square Value (173.32, β)			143.7
635	5% Gamma Approximate KM-UCL (use when n>=50)					0.0172			95% Gamma Adjusted KM-UCL (use when n<50)			0.0172
636												
637	**Lognormal GOF Test on Detected Observations Only**											
638					Shapiro Wilk Test Statistic	0.866	**Shapiro Wilk GOF Test**					
639					5% Shapiro Wilk Critical Value	0.935	Detected Data Not Lognormal at 5% Significance Level					
640					Lilliefors Test Statistic	0.145	**Lilliefors GOF Test**					
641					5% Lilliefors Critical Value	0.145	Detected Data appear Lognormal at 5% Significance Level					
642	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
643												
644	**Lognormal ROS Statistics Using Imputed Non-Detects**											
645					Mean in Original Scale	0.00909			Mean in Log Scale			-5.604
646					SD in Original Scale	0.022			SD in Log Scale			1.33
647					95% t UCL (assumes normality of ROS data)	0.0118			95% Percentile Bootstrap UCL			0.0119
648					95% BCA Bootstrap UCL	0.0141			95% Bootstrap t UCL			0.0147
649					95% H-UCL (Log ROS)	0.0114						
650												

651	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
652					KM Mean (logged)	-4.431				KM Geo Mean	0.0119	
653					KM SD (logged)	0.44				95% Critical H Value (KM-Log)	1.783	
654					KM Standard Error of Mean (logged)	0.0331				95% H-UCL (KM -Log)	0.0139	
655					KM SD (logged)	0.44				95% Critical H Value (KM-Log)	1.783	
656					KM Standard Error of Mean (logged)	0.0331						
657												
658	**DL/2 Statistics**											
659	**DL/2 Normal**						**DL/2 Log-Transformed**					
660					Mean in Original Scale	0.0103				Mean in Log Scale	-4.987	
661					SD in Original Scale	0.0216				SD in Log Scale	0.683	
662					95% t UCL (Assumes normality)	0.0129				95% H-Stat UCL	0.0095	
663	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
664												
665	**Nonparametric Distribution Free UCL Statistics**											
666	**Detected Data appear Approximate Lognormal Distributed at 5% Significance Level**											
667												
668	**Suggested UCL to Use**											
669					KM H-UCL	0.0139						
670												
671	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
672	Recommendations are based upon data size, data distribution, and skewness.											
673	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
674	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician											
675												
676	**Phen**											
677												
678	**General Statistics**											
679					Total Number of Observations	182				Number of Distinct Observations	45	
680					Number of Detects	48				Number of Non-Detects	134	
681					Number of Distinct Detects	43				Number of Distinct Non-Detects	3	
682					Minimum Detect	0.021				Minimum Non-Detect	0.02	
683					Maximum Detect	0.864				Maximum Non-Detect	0.036	
684					Variance Detects	0.021				Percent Non-Detects	73.63%	
685					Mean Detects	0.111				SD Detects	0.145	
686					Median Detects	0.056				CV Detects	1.31	
687					Skewness Detects	3.508				Kurtosis Detects	15.41	
688					Mean of Logged Detects	-2.654				SD of Logged Detects	0.866	
689												
690	**Normal GOF Test on Detects Only**											
691					Shapiro Wilk Test Statistic	0.6	**Shapiro Wilk GOF Test**					
692					5% Shapiro Wilk Critical Value	0.947	Detected Data Not Normal at 5% Significance Level					
693					Lilliefors Test Statistic	0.27	**Lilliefors GOF Test**					
694					5% Lilliefors Critical Value	0.127	Detected Data Not Normal at 5% Significance Level					
695	**Detected Data Not Normal at 5% Significance Level**											
696												
697	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
698					KM Mean	0.0439				KM Standard Error of Mean	0.00627	
699					KM SD	0.0837				95% KM (BCA) UCL	0.0538	
700					95% KM (t) UCL	0.0543				95% KM (Percentile Bootstrap) UCL	0.0549	
701					95% KM (z) UCL	0.0542				95% KM Bootstrap t UCL	0.0607	
702					90% KM Chebyshev UCL	0.0627				95% KM Chebyshev UCL	0.0712	
703					97.5% KM Chebyshev UCL	0.0831				99% KM Chebyshev UCL	0.106	
704												
705	**Gamma GOF Tests on Detected Observations Only**											
706					A-D Test Statistic	2.576	**Anderson-Darling GOF Test**					
707					5% A-D Critical Value	0.773	Detected Data Not Gamma Distributed at 5% Significance Level					
708					K-S Test Statistic	0.191	**Kolmogorov-Smirnov GOF**					
709					5% K-S Critical Value	0.131	Detected Data Not Gamma Distributed at 5% Significance Level					
710	**Detected Data Not Gamma Distributed at 5% Significance Level**											
711												
712	**Gamma Statistics on Detected Data Only**											
713					k hat (MLE)	1.247				k star (bias corrected MLE)	1.183	
714					Theta hat (MLE)	0.0886				Theta star (bias corrected MLE)	0.0934	
715					nu hat (MLE)	119.7				nu star (bias corrected)	113.6	

	A	B	C	D	E	F	G	H	I	J	K	L
716					Mean (detects)	0.111						
717												
718	**Gamma ROS Statistics using Imputed Non-Detects**											
719	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
720	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
721	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
722	This is especially true when the sample size is small.											
723	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
724					Minimum	0.01				Mean		0.0365
725					Maximum	0.864				Median		0.01
726					SD	0.0862				CV		2.359
727					k hat (MLE)	0.765				k star (bias corrected MLE)		0.756
728					Theta hat (MLE)	0.0477				Theta star (bias corrected MLE)		0.0483
729					nu hat (MLE)	278.4				nu star (bias corrected)		275.2
730					Adjusted Level of Significance (β)	0.0487						
731					Approximate Chi Square Value (275.16, α)	237.7				Adjusted Chi Square Value (275.16, β)		237.5
732					95% Gamma Approximate UCL (use when n>=50)	0.0423				95% Gamma Adjusted UCL (use when n<50)		0.0423
733												
734	**Estimates of Gamma Parameters using KM Estimates**											
735					Mean (KM)	0.0439				SD (KM)		0.0837
736					Variance (KM)	0.00701				SE of Mean (KM)		0.00627
737					k hat (KM)	0.275				k star (KM)		0.274
738					nu hat (KM)	99.98				nu star (KM)		99.67
739					theta hat (KM)	0.16				theta star (KM)		0.16
740					80% gamma percentile (KM)	0.0656				90% gamma percentile (KM)		0.131
741					95% gamma percentile (KM)	0.207				99% gamma percentile (KM)		0.406
742												
743	**Gamma Kaplan-Meier (KM) Statistics**											
744					Approximate Chi Square Value (99.67, α)	77.64				Adjusted Chi Square Value (99.67, β)		77.48
745	5% Gamma Approximate KM-UCL (use when n>=50)					0.0563				95% Gamma Adjusted KM-UCL (use when n<50)		0.0564
746												
747	**Lognormal GOF Test on Detected Observations Only**											
748					Shapiro Wilk Test Statistic	0.922				**Shapiro Wilk GOF Test**		
749					5% Shapiro Wilk Critical Value	0.947				Detected Data Not Lognormal at 5% Significance Level		
750					Lilliefors Test Statistic	0.134				**Lilliefors GOF Test**		
751					5% Lilliefors Critical Value	0.127				Detected Data Not Lognormal at 5% Significance Level		
752	**Detected Data Not Lognormal at 5% Significance Level**											
753												
754	**Lognormal ROS Statistics Using Imputed Non-Detects**											
755					Mean in Original Scale	0.0336				Mean in Log Scale		-4.916
756					SD in Original Scale	0.0872				SD in Log Scale		1.808
757					95% t UCL (assumes normality of ROS data)	0.0443				95% Percentile Bootstrap UCL		0.0449
758					95% BCA Bootstrap UCL	0.0483				95% Bootstrap t UCL		0.0514
759					95% H-UCL (Log ROS)	0.0562						
760												
761	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
762					KM Mean (logged)	-3.58				KM Geo Mean		0.0279
763					KM SD (logged)	0.708				95% Critical H Value (KM-Log)		1.941
764					KM Standard Error of Mean (logged)	0.053				95% H-UCL (KM -Log)		0.0397
765					KM SD (logged)	0.708				95% Critical H Value (KM-Log)		1.941
766					KM Standard Error of Mean (logged)	0.053						
767												
768	**DL/2 Statistics**											
769	**DL/2 Normal**									**DL/2 Log-Transformed**		
770					Mean in Original Scale	0.0366				Mean in Log Scale		-4.087
771					SD in Original Scale	0.0861				SD in Log Scale		0.968
772					95% t UCL (Assumes normality)	0.0471				95% H-Stat UCL		0.0313
773	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
774												
775	**Nonparametric Distribution Free UCL Statistics**											
776	**Data do not follow a Discernible Distribution at 5% Significance Level**											
777												
778	**Suggested UCL to Use**											
779					95% KM (Chebyshev) UCL	0.0712						
780												

	A	B	C	D	E	F	G	H	I	J	K	L
781	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
782	Recommendations are based upon data size, data distribution, and skewness.											
783	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
784	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician											
785												

1	**UCL Statistics for Uncensored Full Data Sets**										
2											
3	User Selected Options										
4	Date/Time of Computation	ProUCL 5.16/25/2018 1:29:22 PM									
5	From File	all metals 2016_2017.xls									
6	Full Precision	OFF									
7	Confidence Coefficient	95%									
8	mber of Bootstrap Operations	2000									
9											
10											
11	**Cu**										
12											
13	**General Statistics**										
14	Total Number of Observations	193			Number of Distinct Observations	152					
15					Number of Missing Observations	0					
16	Minimum	6.9			Mean	48.82					
17	Maximum	239			Median	28.6					
18	SD	45.69			Std. Error of Mean	3.289					
19	Coefficient of Variation	0.936			Skewness	1.327					
20											
21	**Normal GOF Test**										
22	Shapiro Wilk Test Statistic	0.8			**Shapiro Wilk GOF Test**						
23	5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level						
24	Lilliefors Test Statistic	0.216			**Lilliefors GOF Test**						
25	5% Lilliefors Critical Value	0.0642			Data Not Normal at 5% Significance Level						
26	**Data Not Normal at 5% Significance Level**										
27											
28	**Assuming Normal Distribution**										
29	**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**						
30	95% Student's-t UCL	54.26			95% Adjusted-CLT UCL (Chen-1995)	54.57					
31					95% Modified-t UCL (Johnson-1978)	54.31					
32											
33	**Gamma GOF Test**										
34	A-D Test Statistic	6.518			**Anderson-Darling Gamma GOF Test**						
35	5% A-D Critical Value	0.775			Data Not Gamma Distributed at 5% Significance Level						
36	K-S Test Statistic	0.135			**Kolmogorov-Smirnov Gamma GOF Test**						
37	5% K-S Critical Value	0.0669			Data Not Gamma Distributed at 5% Significance Level						
38	**Data Not Gamma Distributed at 5% Significance Level**										
39											
40	**Gamma Statistics**										
41	k hat (MLE)	1.355			k star (bias corrected MLE)	1.338					
42	Theta hat (MLE)	36.03			Theta star (bias corrected MLE)	36.5					
43	nu hat (MLE)	523.1			nu star (bias corrected)	516.3					
44	MLE Mean (bias corrected)	48.82			MLE Sd (bias corrected)	42.22					
45					Approximate Chi Square Value (0.05)	464.6					
46	Adjusted Level of Significance	0.0488			Adjusted Chi Square Value	464.2					
47											
48	**Assuming Gamma Distribution**										
49	95% Approximate Gamma UCL (use when n>=50))	54.26			95% Adjusted Gamma UCL (use when n<50)	54.3					
50											
51	**Lognormal GOF Test**										
52	Shapiro Wilk Test Statistic	0.918			**Shapiro Wilk Lognormal GOF Test**						
53	5% Shapiro Wilk P Value	1.221E-15			Data Not Lognormal at 5% Significance Level						
54	Lilliefors Test Statistic	0.102			**Lilliefors Lognormal GOF Test**						
55	5% Lilliefors Critical Value	0.0642			Data Not Lognormal at 5% Significance Level						
56	**Data Not Lognormal at 5% Significance Level**										
57											
58	**Lognormal Statistics**										
59	Minimum of Logged Data	1.932			Mean of logged Data	3.476					
60	Maximum of Logged Data	5.476			SD of logged Data	0.909					
61											
62	**Assuming Lognormal Distribution**										
63	95% H-UCL	56.06			90% Chebyshev (MVUE) UCL	59.97					
64	95% Chebyshev (MVUE) UCL	65.07			97.5% Chebyshev (MVUE) UCL	72.15					
65	99% Chebyshev (MVUE) UCL	86.05									

	A	B	C	D	E	F	G	H	I	J	K	L
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71					95% CLT UCL	54.23			95% Jackknife UCL	54.26		
72					95% Standard Bootstrap UCL	54.27			95% Bootstrap-t UCL	54.76		
73					95% Hall's Bootstrap UCL	54.58			95% Percentile Bootstrap UCL	54.49		
74					95% BCA Bootstrap UCL	54.5						
75					90% Chebyshev(Mean, Sd) UCL	58.69			95% Chebyshev(Mean, Sd) UCL	63.16		
76					97.5% Chebyshev(Mean, Sd) UCL	69.36			99% Chebyshev(Mean, Sd) UCL	81.54		
77												
78	**Suggested UCL to Use**											
79					95% Chebyshev (Mean, Sd) UCL	63.16						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician											
85												

APPENDIX E
TOXICITY ASSESSMENT

APPENDIX F

Toxicity Assessment

The following discussion presents the toxicity of PAHs relative to human health, in accordance with risk assessment guidelines from British Columbia.

D.1 Evaluation of COPC Carcinogenicity

Health Canada, the USEPA, and the International Agency for Research on Cancer (IARC) categorize chemicals as to their carcinogenicity. For each parameter, the regulatory agencies evaluate evidence from human and animal studies, and classify the data in terms of whether the information is adequate to suggest that a chemical is a carcinogen or not. The classifications typically consider whether information is sufficient to classify a substance as a carcinogen, or if there is limited, inadequate, or no data, or if there is evidence of non-carcinogenicity. As new research becomes available, the USEPA, IARC, and Health Canada then adjust their provisional classification based on the results of new studies or other supporting evidence of carcinogenicity. The USEPA, IARC, and Health Canada classification systems based on a weight of evidence are shown in the below table.

Table D-1: Weight of Evidence Classification System for Carcinogenicity

Health Canada	IARC	USEPA	Description
I	1	A	Human carcinogen
II	2A	B B1 B2	Probable human carcinogen Limited human evidence available Inadequate human evidence; sufficient animal evidence
III	2B	C	Possible human carcinogen
IV	3	D	Not classifiable as to human carcinogenicity
V	4	E	Evidence of non-carcinogenicity for humans

Under this paradigm, it is assumed that if a chemical is known or suspected to be a carcinogen in humans or laboratory animals (Health Canada Group I or II), the chemical has the potential to cause cancer at any level of exposure. This is referred to as a non-threshold effect. For chemicals with non-carcinogenic effects (Health Canada Group III, IV, and V), there is a threshold below which no adverse impacts are expected. The below table summarizes the weight-of-evidence carcinogenic classifications for the selected COPCs.

Table D-2: Weight of Evidence Carcinogenic Classification for Human COPCs

COCs	Health Canada	IARC	USEPA
Benzo(a)pyrene	I	1	A- Carcinogenic to humans

The toxicities of all other carcinogenic PAHs are evaluated with respect to benzo(a)pyrene. All of the PAHs retained for the risk assessment are considered potential carcinogens.

D.2 Toxicity Benchmarks

A reference value for a chemical with carcinogenic effects is called a "slope factor" and represents an upper bound estimate of the slope between exposure and occurrence of effect (cancer). The slope factor represents a dose-response relationship, and when multiplied by the estimate exposure does, provides an upper bound estimate of the probability of developing cancer in a chronically exposed population. The slope factor for benzo(a)pyrene is available from Health Canada (2010) while all other PAHs are evaluated with respect to that toxicity. Total potency equivalents (TPE) (CCME 2010) are listed below for the other PAHs, and were used to develop the BaP TPE exposure concentration evaluated here.

Table 4-8. Benzo(a)Pyrene Total Potency Equivalents Evaluation

COPC	Oral Slope Factor (mg/kg-day)$^{-1}$	Dermal Slope Factor (ug/cm^2-day)^1	Inhalation Slope Factor (mg/kg-day)$^{-1}$	Total Potency Equivalents (CCME 2010)	Slope Factor Reference
Benzo(a)pyrene	2.3	3.5	0.137	1	HC 2010
Benzo(b)fluoranthene	0.23	0.35	0.0137	0.1	NA
Benzo(g,h,i)perylene	0.023	0.035	0.00137	0.01	NA
Benzo(k)fluoranthene	0.23	0..35	0.0137	0.1	NA
Indeno(1,2,3-c,d)pyrene	0.23	0.35	0.0137	0.1	NA

REFERENCES:

Canadian Council of Ministers of the Environment (CCME), 2010. Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health: Polycyclic Aromatic Hydrocarbons.

Health Canada. 2010. Federal Contaminated Site Risk Assessment in Canada Part II: Health Canada Toxicological Reference Values (TRVs);

APPENDIX F
LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

Any unauthorized use of the Professional Document is at the sole risk of the user. TETRA TECH accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, is in fact, caused by the unauthorized use of the Professional Document.

Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this document, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to explore, address or consider and has not explored, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems, methods and standards employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historical environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional exploration and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity can impact structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques, and construction sequence are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, and the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function. Where temporary or permanent drainage systems are installed within or around a structure, these systems must protect the structure from loss of ground due to mechanisms such as internal erosion and must be designed so as to assure continued satisfactory performance of the drains. Specific design details regarding the geotechnical aspects of such systems (e.g. bedding material, surrounding soil, soil cover, geotextile type) should be reviewed by the geotechnical engineer to confirm the performance of the system is consistent with the conditions used in the geotechnical design.

1.16 DESIGN PARAMETERS

Bearing capacities for Limit States or Allowable Stress Design, strength/stiffness properties and similar geotechnical design parameters quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition used in this report. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions considered in this report in fact exist at the site.

1.17 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

1.18 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

This document has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. TETRA TECH cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.

Report to Council

Date:	April 24, 2023
To:	Council
From:	City Manager
Subject:	MOU Agreements 2/3 – Water and Wastewater Servicing to OKIB I.R.#7 Lands
Department:	Infrastructure

Recommendation:

THAT Council receives for information the report from the Infrastructure General Manager dated April 24, 2023, regarding the Water and Wastewater Servicing Agreement to OKIB I.R.#7;

AND THAT the Mayor and City Clerk be authorized to execute the Water and Wastewater Servicing Agreement to OKIB I.R.#7 on behalf of the City of Kelowna.

Purpose:

To execute an agreement where Kelowna provides water and wastewater servicing to Okanagan Indian Band lands on Indian Reserve No. 7.

Background:

In 2020, City of Kelowna staff entered negotiations with the District of Lake Country (DLC) and Okanagan Indian Band (OKIB) staff to craft agreements on mutually shared services and projects that would benefit each community. This work culminated in the Memorandum of Understanding (MOU) between the parties which was signed in February 2022.

Over the past year, the negotiation of several legal agreements has been conducted between the three partners and the Government of Canada. The parties are actively finalizing six separate legal agreements for the following subjects:

MOU Ref #	Agreement Description	Status
1	Water supply agreement between Kelowna and Lake Country	Complete
2&3	***Water and Wastewater Servicing Agreement between Kelowna and OKIB***	***Subject of this report***
4a	Sewer permit agreement between Kelowna, OKIB and Canada	Complete
4b	Rail Trail Access Permit between Kelowna and OKIB	Separate Concurrent Report
4c	Commonwealth Road permit between Kelowna, OKIB and Canada	Under development
5	Sewer Agreement between Kelowna and Lake Country	Complete

Discussion:

The Water and Wastewater Servicing Agreement (MOU Reference #2 and 3) between Kelowna and OKIB is ready for execution and attached to this report.

Almost all properties on I.R.#7 are serviced by wells for water supply and septic fields for wastewater disposal. There are over 1,500 units of existing development and an estimated population of some 2,400 residents living on these properties. A couple of individual properties are serviced by Kelowna with water and wastewater connections under past individual agreements. The City has been advised that there are concerns with the quality of water provided by some of the wells as well as concerns with the large septic fields being in proximity of area lakes and creeks. This umbrella agreement provides the framework for water and wastewater service to any property with the reserve under the same conditions as provided to any similar property within the City's water and wastewater utility service areas.

As the OKIB is currently not self-governing nor have a utility service for this reserve, the City will look to enter into a separate agreement with each property owner who chooses to connect. The agreement allows the OKIB to take over administration of those services in the future should they become self-governing or set up a utility. The City will provide service to the property line where property owners become responsible for distribution and collection within their own properties and administer their on-site users. The City will require applicable development cost charges and water capacity growth charges to be paid for any redevelopment expansions in the future, but existing development will be exempt from those charges. New development will also contribute $2,000 per equivalent dwelling unit to road improvements to Commonwealth and Beaver Lake Roads. The City will also require one or more fire hydrants (depending on individual locations) to be installed to improve fire protection on existing properties.

Service Area: The area to be serviced under this agreement is I.R. #7.

Term: Ongoing. Can be terminated by either party with 5 years notice. Can be terminated earlier for breach.

Costs: Kelowna pays $10.00 to OKIB on the Commencement Date, the receipt and sufficiency of which are hereby acknowledged by the parties.

Conclusion:

The Water and Wastewater Servicing Agreement is one of a suite of agreements envisioned in the 2022 MOU between Kelowna, DLC and OKIB. The commitments, both financial and technical, are consistent with the broader goals of resolving the many issues being addressed by the MOU. The Water and Wastewater Servicing Agreement clarifies key terms and roles and limitations as envisioned in the MOU.

Internal Circulation:
Communications
Financial Planning

Considerations applicable to this report:

Financial/Budgetary Considerations:
Any service connections or expansion of city infrastructure to service IR#7 will be funded by the applicable property owner(s). Rates and revenues for service will be on the same terms and conditions as other properties in the service area.

Communications Comments:
A formal signing ceremony will be held to jointly complete and celebrate several OKIB, DLC and Kelowna agreements.

Considerations not applicable to this report:
Legal/Statutory Authority:
Legal/Statutory Procedural Requirements:
Existing Policy:
Financial/Budgetary Considerations:
External Agency/Public Comments:

Submitted by: M. Logan, Infrastructure General Manager

Approved for inclusion: D. Gilchrist, City Manager

Attachment 1 – Water and Wastewater Servicing Agreement
Attachment 2 - OKIB CoK Water and Wastewater Servicing Agreement Presentation

cc: Divisional Director, Corporate Strategic Services
Acting Division Director, Financial Services

WATER AND WASTEWATER AGREEMENT

BETWEEN:

OKANAGAN INDIAN BAND

AND:

CITY OF KELOWNA

Duck Lake Indian Reserve No. 7

Dated for Reference: April 24, 2023

Copy _____ of _____

WATER AND SEWER SERVICES AGREEMENT

This Agreement, dated for reference _____ 2023, is made between:

OKANAGAN INDIAN BAND, a "band" within the meaning of the *Indian Act* having an office at 12420 Westside Road, Vernon, BC, V1H 2A4

("OKIB")

and:

CITY OF KELOWNA, a municipality under the laws of British Columbia having an office at 1435 Water Street, Kelowna, BC V1Y 1J4

("City")

BACKGROUND:

A. OKIB has approved this Agreement by passing a Band Council Resolution at its meeting held on _____, 2023 in accordance with the provisions of the *Indian Act*. A copy of the Band Council Resolution is attached to this Agreement as Schedule A.

B. The City Council has approved this Agreement.

C. The City has constructed waterworks for the supply and distribution of domestic water and sewerage works for the provision of domestic water and the collection and treatment of sewer, to properties in and around the Reserve and the City.

D. The Parties deem it to their mutual interest to enter into this Agreement to provide water and sewer services to properties on the Reserve that choose to connect.

E. The Services provided or outlined within this Agreement are in the spirit of cooperation outlined in the Memorandum of Understanding made as of January 25, 2022, between the District of Lake Country, OKIB and the City.

F. The intent of this agreement is to outline the principles and overarching terms and conditions required for individual properties in the Reserve to receive water and/or wastewater services from the City of Kelowna.

NOW THEREFORE, for mutual consideration, the Parties agree as follows:

1.0 DEFINITIONS

1.1 In this Agreement, including this section, the recitals and schedules hereto, unless the context otherwise requires:

"City Sewer System" means the City's system of sanitary sewer mains and sewage facilities located outside the Reserve.

"City Water System" means the City's system of water mains and pipes, pumps, and other facilities and equipment used to supply potable water located outside the Reserve excepting a historic water transmission main which is within a separate agreement and right of way.

"City Systems" means collectively, the City Sewer System and the City Water System.

"**Commencement Date**" means the date set out in section 2.1.

"**CP Holder**" means a Certificate of Possession holder within the Reserve in accordance with the provisions of the *Indian Act*.

"CP Holder Service Agreement" means an agreement between the City and a CP Holder for the supply of Services, substantially on the same terms as this Agreement.

"*Indian Act*" means the *Indian Act*, RSC 1985, c I-5.

"Point of Connection" means a point where the City Systems connect to the Reserve Systems.

"Property Owner" means

(i) OKIB, in respect of Reserve land controlled by OKIB; and
(ii) a CP Holder, in respect of a parcel of Reserve land controlled by that CP Holder.

"Reserve" means Duck Lake Indian Reserve No. 7, which has been set apart for the use and benefit of OKIB.

"Reserve Sewer System" means the system of OKIB owned or CP Holder owned sanitary sewer mains and laterals on the Reserve for the purpose of collection and conveying sanitary waste from the Reserve to the City System under a Service Agreement.

"Reserve Systems" means collectively, the Reserve Sewer System and the Reserve Water System.

"Reserve Water System" means the system of OKIB owned, or CP Holder owned water mains and lateral supply pipes on the Reserve for the provision of water services to the Reserve under a Service Agreement.

"Services" means the municipal services provided by the City that are described in section 4.1.

"Service Agreement" means an agreement for the supply of Services to Reserve property and includes this Agreement and a CP Holder Service Agreement.

"Term" means a period of time which this Agreement remains in force and effect, as described in section 2.

2.0 TERM

2.1 This Agreement commences on _____, 2023 and shall continue until termination under sections 2.2, 12.1 or 12.2 of this Agreement.

2.2 This Agreement may be terminated by either Party, at their sole discretion, upon five (5) years written notice.

3.0 GOVERNANCE AND ROLES

3.1 OKIB and the City acknowledge that the ability for the City to enforce compliance with a Service Agreement is limited on Reserve. OKIB acknowledges and supports that the City may need to terminate water or sewer services to a property if compliance with the Service Agreement by a Property Owner cannot be satisfactorily achieved.

3.2 Should OKIB wish to provide water and sewerage services for the Reserve in the future, the City and OKIB will terminate this Agreement with a goal of transferring all aspects of responsibility for CP Holder Service Agreements to OKIB.

3.3 The City will not enter the Reserve for the purpose of operation, maintenance or construction of any facilities on site other than any City infrastructure, including water meters, that may be located on Reserve. However, at the direct request of OKIB or a CP Holder, the City may enter the Reserve to provide servicing advice or assistance.

3.4 CP Holder Service Agreements will allow for the transfer of those Service Agreements to OKIB.

3.5 OKIB will not be a party to a CP Holder Service Agreement and is not responsible for enforcing any terms and conditions within CP Holder Service Agreements. For clarity, enforcement of CP Holder Service Agreements will rest with the City.

4.0 SERVICES

4.1 During the Term of this Agreement, the City will, at OKIB's request, provide one or both of the following services to OKIB for any properties in the Reserve:

(a) supply of potable water from City Water System to Reserve Water System; and

(b) collection, conveyance, treatment and disposal of sanitary waste that is discharged from the Reserve Sewer System to the City Sewer System (the "**Services**").

4.2 The City will provide one or both of the Services to a CP Holder that chooses to enter into a CP Holder Service Agreement.

4.3 The costs, quality and quantity of the Services to be provided by the City under a Service Agreement will be substantially the same as the costs, quality and quantity of Services provided by the City to the users of such Services on non-Reserve lands within the City. The City is not obliged to provide Services at a greater level or degree than the level or degree to which the same Services are provided elsewhere within the City.

4.4 The City makes no representation or warranty that the level or degree of Services provided under a Service Agreement will be maintained or continued to any particular standard, other than as stated expressly herein.

4.5 OKIB acknowledges and agrees, and a CP Holder who chooses to connect to Services will acknowledge and agree, that there may be from time-to-time interruptions or reductions in the level of Services, and that the City will not be held liable for any losses, costs, damages, claims or expenses arising from or connected with a temporary interruption or reduction in the level of a Service provided under this Agreement or the Service Agreements.

4.6 As a condition of Service, OKIB agrees, subject to the terms of this Agreement, and a CP Holder will agree, subject to the terms of a CP Holder Service Agreement, to comply with the relevant and applicable sections of the following related City bylaws, as amended or replaced from time to time:

(i) Water Regulation Bylaw 10480, as amended,
(ii) Sewerage System User Bylaw 3480 as amended,
(iii) Sanitary Sewer / Storm Drain Regulation Bylaw 6618-90 as amended,
(iv) Well Regulation Bylaw 11770 as amended which outlines the requirements of managing on-site wells prior to obtaining a City water service.

4.7 As a condition of Service, and in a manner consistent with strata corporation developments in the City, OKIB or a CP Holder that wishes to connect to Services will retain a professional engineer registered and in good standing with the Engineers and Geoscientists British Columbia and maintaining professional liability and errors and omissions insurance (the "Professional Engineer") to design and to provide engineering services for the construction of a Reserve System, which Professional Engineer shall certify to the City that such works have been constructed to the appropriate standards and specifications. The Professional Engineer's certification must be delivered to the City, along with all of the Professional Engineer's inspection records and as-built drawings before any new Reserve System may be connected to the respective City System.

4.8 In the interests of improved fire protection on individual properties, any existing property connecting to water must install a minimum of one fire hydrant to the water system.

5.0 EXISTING SERVICE AGREEMENTS

5.1 The City and OKIB agree to work to transition the Sewer Effluent Servicing Agreement between the City and OKIB dated July 26, 2010 to a new Service Agreement.

5.2 The City and OKIB will use their best efforts to have water and sewer services that are currently provided to the Property Owner of 8850 Jim Bailey Road, legally described as Lot 5, Plan 59290 CLSR and Road, Plan 56035 CLSR, continue under a new CP Holder Service Agreement as soon as practicable upon the Commencement Date. For clarity, there will be no interruption in service, as service will continue under the Development Servicing Agreement dated September 16, 2020 between the City and the Property Owner until transferred and continued under a new CP Holder Service Agreement.

6.0 PAYMENT FOR SERVICES

6.1 OKIB agrees to, and CP Holders who choose to connect to Services will be required to, pay user fees for services that are consistent with similar properties outside of the Reserve on a frequency consistent with City bylaws.

6.2 OKIB acknowledges that no deduction from the established City fees shall be allowed on account of any rupture, leak, breakdown, or malfunction of the Reserve Systems or any plumbing on Reserve.

6.3 OKIB and CP Holders who choose to connect to Services will pay for purchasing and installation of the water and sewer meters to the City's satisfaction. The City will own the meters and is responsible for their maintenance and renewal.

7.0 CONSTRUCTION OF NEW RESERVE SYSTEMS

7.1 Each Reserve System, including any extension of a Reserve System and any replacement of a Reserve System made necessary by accidental loss, wear and tear, breakdown, malfunction or obsolescence, must be constructed at the sole cost of the relevant Property Owner and must meet good engineering standards.

7.2 A City representative shall be present for the final connection to the City System.

7.3 The City reserves the right to refuse a connection if the conditions of service cannot be met.

8.0 RESPONSIBILITY OF RESERVE SYSTEMS

8.1 A Property Owner shall at all times retain responsibility of the Reserve Systems on their property under this Agreement, and no interest, right or title to the Reserve Systems shall be conveyed to the City under this Agreement.

8.2 Except with the prior written consent of a Property Owner, the City will not utilize the Reserve Systems or establish any connection thereto, except for the purpose of providing Services under this Agreement.

8.3 The City will not construct, operate, maintain, remove or administer infrastructure on the Reserve, with the exception of the existing Water Transmission Main, shown highlighted in yellow on the map attached as Schedule C and any City owned water meters that may be located on Reserve.

8.4 The City will not be responsible for administration, operation, maintenance or renewal requirements for the Reserve Systems.

9.0 OPERATION, REPAIRS AND MAINTENANCE

9.1 The City will be responsible for all operation and maintenance of the City Systems up to the Point of Connection. The City will notify OKIB and affected CP Holders should any stoppages of service occur due to maintenance or short-term system failure.

9.2 OKIB or the CP Holder will promptly notify the City of any breakdown in a Reserve System on their property that requires any repair or maintenance work that may impact either City System.

9.3 OKIB and any CP Holder who chooses to connect to water will ensure that a backflow prevention program similar in outcome to the City's program is implemented on the Reserve.

10.0 FUTURE DEVELOPMENT AND COLLECTION OF DEVELOPMENT FEES

10.1 In accordance with the Memorandum of Understanding dated January 25, 2022, between the District of Lake Country, OKIB and the City, OKIB and the City shall develop policies and procedures with respect to future development on the Reserve to assure that appropriate growth charges are paid to the City for City Systems growth costs.

10.2 Subject to sections 10.3 and 10.4, OKIB and any CP Holder who chooses to connect to Services shall pay to the City, such fees and other charges payable in respect of the capital costs of providing, constructing, altering or expanding water and sewer facilities to service, directly or indirectly, new or expanded Reserve developments. Any required extension of or connection to the Services on City property or within a City highway or right of way will become the property of the City upon certification by the City of the completion of such works to the standards required under this Agreement.

10.3 The City will not apply any growth capacity charges for water, or development cost charges for water or wastewater for servicing the existing developments on Reserve. As of the date of execution of this Agreement, the existing developments consist of 1553 residential units with a population of 2,400 people on Reserve. Water and wastewater charges for additional development within an existing development will apply as they do for other City properties.

10.4 OKIB acknowledges that the figures in section 10.3, as they relate to existing developments within the Reserve, were determined by the process set out in the Water Demand Analysis Memorandum attached as Schedule B. OKIB agrees that this Memorandum will form the basis of determining the credit available for each

existing development when dealing with impact of additional growth on increased demands for water or wastewater in the future and calculating when charges are to be paid arising from a development.

10.5 Any new or expanded development on the Reserve that requires Services (as determined pursuant to section 10.4) must pay a levy to the City for roads in the amount of $2,000.00 per single family equivalent units for improvements that will be used by the City solely for the capital improvements to Commonwealth and Beaver Lake Roads.

11.0 RIGHTS OF ACCESS

11.1 The City's officers, servants, agents or employees may at any time upon providing a Property Owner who has chosen to connect to Services with not less than the amount of notice that would be provided off the Reserve in similar circumstances, enter upon the Reserve for the purpose of providing any of the Services required in accordance with this Agreement and ensuring compliance with the terms of this Agreement.

12.0 TERMINATION FOR BREACH OF AGREEMENT

12.1 OKIB acknowledges that whether or not the Services are discontinued or any disconnections are made, where invoices remain unpaid after six (6) months, the City shall have the right, without prejudice to any other right or remedy, to terminate this Agreement, after giving OKIB six (6) months written notice.

12.2 Should either party be in breach of its covenants or undertakings other than a failure by OKIB to pay for Services, which remains un-rectified for a period of six (6) months (and which can be rectified within that time period) following written notification of such breach, the party not in breach may, at its option and without prejudice to any other rights or remedies it might have, terminate this Agreement after providing one (1) year's written notice to the party in breach.

13.0 LIABILITY

13.1 The City does not warrant or guarantee the continuance or quality of any of the services provided under this Agreement and shall not be liable for any damages, expenses, or losses occurring by reason of suspension or discontinuance of the Services for any reason which is beyond the reasonable control of the City, including without limitation acts of God, forces of nature, soil erosion, landslides, lightning, washouts, floods, storms, serious accidental damage, strikes or lockouts, vandalism, negligence in the design and supervision or construction of the Reserve Systems, or in the manufacture of any materials used therein, and other similar circumstances.

14.0 COMMUNICATIONS AND CONTACT PROTOCOL

14.1 All the Parties to this agreement will appoint one or more representatives, with notice to the other Parties of such appointments as the principal contacts for official communications about this Agreement, and as the principal contacts for operational matters pursuant to this Agreement. The Parties further agree to

establish a communications protocol to manage issues arising under this Agreement.

15.0 DISPUTE RESOLUTION

15.1 In the interest of cooperative and harmonious co-existence, the parties agree to use their best efforts to avoid conflict and to settle any disputes arising from or in relation to this Agreement. The Parties acknowledge and agree that this section 15.1 does not limit either Party's respective rights under section 12.1 or 12.2 above.

15.2 In the event that the parties fail to resolve matters, the parties shall seek a settlement of the conflict by utilizing the Joint Problem-Solving Method as described in the Federation of Canadian Municipalities (FCM) First Nations – Municipal Community Infrastructure Partnership Program, and recourse to the Courts shall be a means of last resort, except when public health or safety is concerned.

16.0 ACKNOWLEDGEMENT OF RIGHTS

16.1 Nothing contained in this Agreement will be deemed to limit or affect any other Aboriginal rights or claims OKIB may have at law or in equity. Nothing contained in this Agreement will be deemed to limit or affect the legal rights, duties of obligations of the City. The Parties agree that nothing in this Agreement will affect the cooperation or consultation covenants the Parties have entered into pursuant to other Agreements.

17.0 HEADINGS

17.1 Headings that precede sections are provided for the convenience of the reader only and shall not be used in constructing or interpreting the terms of this Agreement.

18.0 ENTIRE AGREEMENT

18.1 This Agreement constitutes the entire Agreement between the Parties and there are no undertakings, representations or promises express or implied, other than those expressly set out in this Agreement.

18.2 This Agreement supersedes, merges, and cancels any and all pre-existing agreements and understandings in the course of negotiations between the Parties.

19.0 NOTICE

19.1 The address for delivery of any notice or other written communication required or permitted to be given in accordance with this Agreement, including any notice advising the other Party of any change of address, shall be as follows:

(a) to City:

City of Kelowna
1435 Water Street
Kelowna, British Columbia, Canada
V1Y 1J4

Attention: City Clerk

(b) to OKIB:

Okanagan Indian Band
12420 Westside Road,
Vernon, BC
V1H 2A4

Attention: Chief

19.2 Any notice mailed shall be deemed to have been received on the fifth (5th) business day following the date of mailing. By notice faxed or emailed will be deemed to have been received on the first (1st) business day following the date of transmission. For the purposes of this section, the term "business day" shall mean Monday to Friday, inclusive of each week, excluding days which are statutory holidays in the Province of British Columbia.

19.3 The Parties may change their address for delivery of any notice or other written communication in accordance with section 19.1.

20.0 SEVERANCE

20.1 In the event that any provision of the Agreement should be found to be invalid, the provision shall be severed and the Agreement read without reference to that provision.

20.2 Where any provision of the Agreement has been severed in accordance with section 20.1 and that severance materially affects the implementation of this Agreement, the parties agree to meet to resolve any issues as may arise as a result of that severance and to amend this Agreement accordingly.

21.0 AMENDMENT

21.1 The Agreement shall not be varied or amended except by written agreement of both Parties.

21.2 No waiver of the terms, conditions, warranties, covenants, and agreements set out herein shall be of any force and effect unless the same is reduced to writing and executed by all parties hereto and no waiver of any of the provisions of this Agreement will constitute a waiver of any other provision (whether or not similar) and no waiver will constitute a continuing waiver unless otherwise expressly provided.

22.0 GOVERNING LAWS

22.1 The provisions of this Agreement will be governed and interpreted in accordance with the laws of British Columbia or Canada, as applicable.

23.0 ASSIGNMENT

23.1 The rights and obligations of the Parties may not be assigned or otherwise transferred. An amalgamation by a Party does not constitute an assignment.

24.0 ENUREMENT

24.1 The Agreement enures to the benefit and is binding upon the Parties and their respective heirs, executors, administrators and successors.

IN WITNESS WHEREOF the parties hereto have executed this Agreement.

On behalf of the CITY OF KELOWNA:	On behalf of the OKANAGAN INDIAN BAND
_____	_____
Mayor Thomas Dyas	Chief Byron Louis
_____	_____
City Clerk – Stephen Fleming	Witness

SCHEDULE “A” – Band Council Resolution

SCHEDULE “B” – Memorandum – (OKIB I.R.#7) Water Demand Analysis

Prepared for: Kevin Van Vliet, Utility Services Manager
Topic: OKIB – I.R. #7 - Water Demand Analysis
City of Kelowna Water Supply to OKIB I.R.#7 Lands
Original Date: December 20, 2022
Revised: March 20, 2023 – Revision 2
Prepared by: Rod MacLean, P. Eng., Utility Planning Manager, City of Kelowna
Reviewed by: Jim Hager, Utility Planning Design Technician,
Luke Dempsey, P. Eng., Utility Planning Engineer
Robinson Puche, Utility Planning Technologist

1. BACKGROUND

In January 2022, the City of Kelowna (City), Okanagan Indian Band (OKIB) and District of Lake Country (District) signed a memorandum of understanding (MOU) to resolve several outstanding issues between the three governments that have gone unresolved for many years. The motivating factors include OKIB's desire for water and sewer for properties under its jurisdiction, a joint interest to complete the Okanagan Rail Trail through OKIB lands, ongoing joint water supply issues, wastewater effluent capacity concerns in the District, and road quality issues on Beaver Lake Road.

As part of the MOU, the City will provide the opportunity for water and wastewater servicing to all lands within I.R.#7. The City will receive a bulk water supply from the District for a fee, and in turn, the City will deliver, maintain and meter potable water supply to all customers, including OKIB lands, within the City boundary as shown in Figure A-1. As with all municipal servicing, the City's responsibilities end at the property line. For the OKIB lands, OKIB has agreed to responsibility for servicing internal individual lots or units. The City will bill bi-monthly to OKIB or its subsidiary.

As of December 2022, the City is not responsible for supplying water to the OKIB. OKIB currently operates under private water supplies or or through agreement with the District.

As part of the MOU, the District has indicated it has enough capacity to provide an average day demand of 16 litres per second of potable water to the existing developed area on OKIB lands. Should development expand beyond this capacity, it is assumed that growth will need to cover any added infrastructure costs for additional supply.

The purpose of this memo is to confirm the current design demand of all properties within I.R. #7 lands and project future water supply to an ultimate development demand scenario anticipated in 2075.

2. WATER SUPPLY ANALYSIS

a. Current Demand Design Criteria

For this analysis, it is assumed that the City provides all servicing to the property line. This assumes enough flow, pressure, and capacity for fire protection. To determine current demand, the City uses methodology from Bylaw 7900 – Subdivision, Development and Servicing Bylaw which outlines design criteria and standards of practice. To equate zoning, this analysis assumes a land use-based assessment code for each property to help address typical zoning requirements (i.e., Single family, multi-family, commercial or industrial needs). The criteria used for the other customers in the service area all use the same base criteria as shown in Table 1.

Table 1. Design Criteria for Agreements and Adjusted Current Demands

Area	Agreement or Bylaw	Zoning	Governing Agreement MDD[1]	Zoning or Agreement Density (people/ha)	Adjusted Current Unit Population Densities[2]	
					Current Use	People/ha
District Metered Properties	Bylaw 7900	Ind.	DLC	55.56	Ecotex[3] Heavy Ind Light Ind	84.2 55.56 12.5
Shanks Road	City Ag Policy	Ag MF Com	5 USgpm/ac (up to 685mm) 600 l/cap/d 1800 l/cap/d	 300 workers 189 workers		No change
OKIB	Bylaw 7900	MF Com	N/A	25		No change
New Lands	Bylaw 7900	Ind/Com	N/A		Heavy Ind Light Ind	55.56 12.5

Notes:

1. Unit demands (MDD) assume 1,800 L/cap/day (Bylaw 7900).
2. Adjusted population based on Bylaw No. 7900 and current BC Assessment Land Use,
3. Ecotex located at 9730 McCarthy Road.

b. Calculation of Current System Demand in OKIB Lands

Data was collected using available mapping, recent population statistics and current air photography from Spring 2022.

According to BC Assessment data for 2021, there were 1,553 residential units housing a population of 2,404 people. This calculates to over 19 units per hectare over a developable area of approximately 124 hectares. This unit development range coincides with a Residential 2 Land Use in the City of Kelowna (as per Development Cost Charge Bylaw No. 12420):

> *"Residential 2" – developments with a density greater than 15 and less than or equal to 35 residential dwelling units per net hectare (generally small lot single family, row housing).*

This equates to two (2) people per unit. Based on the information outlined above, the current demand for the OKIB lands is estimated at 34.6 L/s, and the maximum day demand (MDD) is 69.1 L/s (See Table 2). It is assumed that each of the leased parcels will eventually be supplied water by the City.

Table 2. Summary of Current Demand (2021) of OKIB Lands

Sub-Area	2021 Metered ADD (lps)	Current Demand (L/s)		Current Demand (m^3/year)	
		ADD	MDD	ADD	MDD
OKIB[1]	Unknown	34.6	69.1	1,089,900	2,179,700

Notes:

1. Assumes all CP holders are connected.

3. DEMAND FROM FUTURE GROWTH

To assist the City in estimating future demand in the area and properly plan for sustainable water supply, an analysis of potential future development on OKIB lands was needed to address future demand. For this analysis, it is assumed that the ultimate buildout for the entire area will occur up to the Year 2075. The estimates are conservative, and are essentially for planning purposes only to assure capacity needs are always met.

For residential properties, the highest current population density of 30 units per hectare occurs at the Holiday Park Resort. Densities in other areas are significantly lower. As such, a more realistic residential density of 25 units per hectare will be used.

For industrial and commercial developments, a hybrid density of 25.4 people per hectare is used. While greater water consuming industrial uses (55.56 people per ha) will be allowed, this "hybrid" unit population density was used consistently with other planning in the Jim Bailey industrial areas and allows for more realistic capacity expectations. Fire flows remain 225 L/s for all industrial uses.

The future capacity for the OKIB can be found in Table 3.

Table 3. Summary of Ultimate Demand Requirement

Sub-Area	Ultimate Demand (L/s)		Ultimate Demand (m^3/year)	
	ADD	MDD	ADD	MDD
OKIB	65.1	130.1	2,052,100	4,104,100

4. CLOSING

The City and OKIB will work together to confirm this data, then look forward to analyzing future growth and project into new development areas using the same approach. The City believes that using a demand-based approach provides a more stable measure to determine future supply infrastructure.

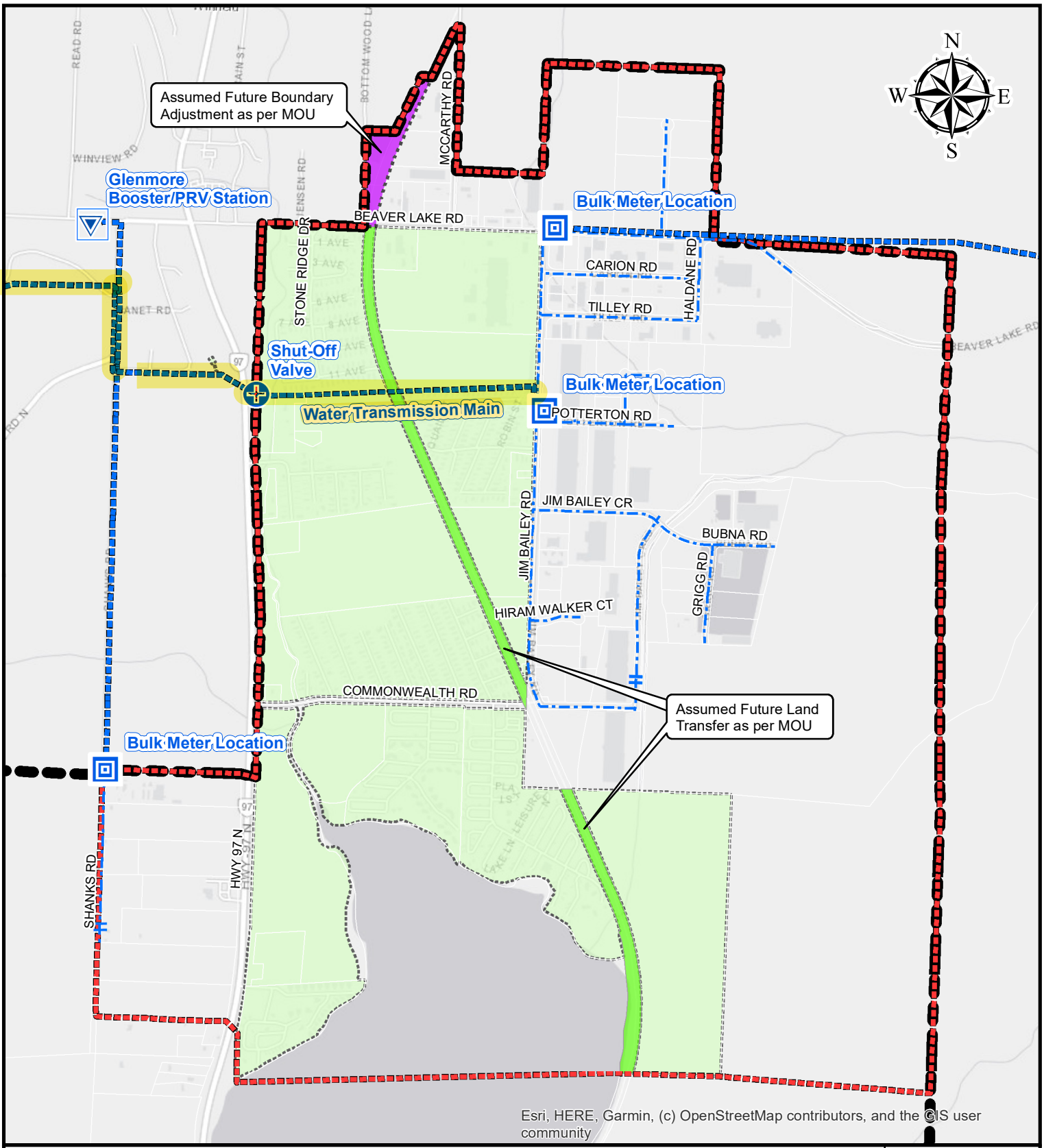
ATTACHMENTS

Table A-1 - Detailed Water Demand Analysis by Property and Agreement Area

Table A-1. Detailed Water Demand Analysis by Property and Agreement Area

Area or Agreement	OKIB I.R. #7													
Original Sub-Area No.														
Property / Address	2a 485 Beaver Lake Rd	2b 715 Beaver Lake Rd	3 8495 Hwy 97N	4a 720 Commonwealth	4b 415 Commonwealth	5 Holiday Park	6a 7841 Hwy 97N	6b 9020 Jim Bailey Rd.	7 9450 Jim Bailey Rd.	9 E of Hwy 97N	8850 Jim Bailey Road Wedge (Existing City Service)	Southern Property (industrial) 8355 Jim Bailey Rd	**Subtotal OKIB Lands**	
Current Demands														
Year of Meter Reading													0	units
Start														
End														
Water Usage (m^3)														
Period of Usage (days)														
OKIB Units 2022 (Per BCAC)		149	57	236	220	468	23	154	16	230			1,553	Units
Population 2022 (Per BCAC)		292	114	438	249	508	26	322	28	427			2,404	people
2022 Unit Density (people/ha)		13	6	14	35	30	1	26	180	16			19.4	pp/ha
ADD (L/d)		262,800	102,600	394,200	224,100	457,200	23,400	289,800	25,200	384,300			2,163,600	25.0 l/s
MDD (L/d)		525,600	205,200	788,400	448,200	914,400	46,800	579,600	50,400	768,600			4,327,200	50.1 l/s
Estimated Current Design Demand based on BCAA Land Use and Bylaw 7900														
Lot Area (ac)	34.60	24.54	24.46	40.70	15.32	38.55	65.73	14.58	0.22	36.40	3.52		298.6	
Lot Area (Ha)	15.51	11.70	9.90	16.47	6.20	15.60	26.60	5.90	0.09	14.73	1.42		124.1	
Irrigated or Developable Area (Ha)	15.51	11.70	9.90	16.47	6.20	15.60	26.60	5.90	0.09	14.73	1.42		124.1	
Land Use	I-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	C406			
2022 Units		149	57	236	220	468	23	154	16	230			0	
Density by Land Use (people/ha or unit)	12.50	2	2	2	2	2	2	2	2	2	12.50			
Unit Demand (L/cap/day)	900	900	900	900	900	900	900	900	900	900	900			
MDD multiplier	2	2	2	2	2	2	2	2	2	2	2			
Population Equivalent	194	298	114	472	440	936	46	308	32	460	18		3,318	people
ADD (L/d)	174,488	268,200	102,600	424,800	396,000	842,400	41,400	277,200	28,800	414,000	16,026		2,985,913	35 l/s
MDD (L/d)	348,975	536,400	205,200	849,600	792,000	1,684,800	82,800	554,400	57,600	828,000	32,051		5,971,826	69 l/s
Peak hour														138 l/s
Annual (ML/y)	63.7	97.9	37.4	155.1	144.5	307.5	15.1	101.2	10.5	151.1	5.8		**1,090**	
BCAA Land Use (Current)														
Ultimate Design Demand as per Agreements or 7900 (worst Case)														
Lot Area (ac)	34.60	24.54	24.46	40.70	15.32	38.55	65.73	14.58	0.22	36.40	3.52	60.91	359.5	
Lot Area (Ha)	15.51	11.70	9.90	16.47	6.20	15.60	26.60	5.90	0.09	14.73	1.42	24.65	148.8	
Irrigated or Developable Area (Ha)	15.51	11.70	9.90	16.47	6.20	15.60	26.60	5.90	0.09	14.73	1.42	0.00	124.1	
Land Use	I-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	I-7900		
SF Density by Land Use (units/ha)		35	35	35	35	35	35	35	35	35	35			
People per unit		2	2	2	2	2	2	2	2	2	2			
Unit Demand (L/cap/day)	900	900	900	900	900	900	900	900	900	900	900	900		
MDD multiplier	2	2	2	2	2	2	2	2	2	2	2	2		
Ind'l Density by Agmt or Zone (pp/ha)	55.56											55.56		
Population Equivalent	862	819	693	1,153	434	1,092	1,862	413	6	1,031	100	0	8,465	
ADD (L/d)	775,500	737,100	623,700	1,037,654	390,600	982,800	1,675,800	371,700	5,609	928,025	89,743	0	7,618,232	88.2 l/s
MDD (L/d)	1,551,000	1,474,200	1,247,400	2,075,309	781,200	1,965,600	3,351,600	743,400	11,218	1,856,050	179,486	0	15,236,463	176.3 l/s
Annual (ML/y)	283.1	269.0	227.7	378.7	142.6	358.7	611.7	135.7	2.0	338.7	32.8	0.0	**2,781**	
Hybrid Ultimate Design Demand														
Lot Area (ac)	34.60	24.54	24.46	40.70	15.32	38.55	65.73	14.58	0.22	36.40	3.52	60.91	359.5	
Lot Area (Ha)	15.51	11.70	9.90	16.47	6.20	15.60	26.60	5.90	0.09	14.73	1.42	24.65	148.8	
Developable Area (Ha)	12.41	11.70	9.90	16.47	6.20	15.60	26.60	5.90	0.09	14.73	1.42	19.72	140.7	
Future Zoning	300	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	R-7900	300		
SF Density by Land Use (units/ha)		25	25	25	25	25	25	25	25	25	25			
People per unit		2	2	2	2	2	2	2	2	2	2			
Unit Demand (L/cap/day)	900	900	900	900	900	900	900	900	900	900	900	900		
MDD multiplier	2	2	2	2	2	2	2	2	2	2	2	2		
Ind'l Density by Land Use (pp/ha)	25.42											25.42		
Population Equivalent	315	585	495	824	310	780	1,330	295	4	737	71	501	6,247	
ADD (L/d)	283,500	526,500	445,500	741,182	279,000	702,000	1,197,000	265,500	4,006	662,875	64,102	450,900	5,622,065	65.1 l/s
MDD (L/d)	567,000	1,053,000	891,000	1,482,364	558,000	1,404,000	2,394,000	531,000	8,013	1,325,750	128,204	901,800	11,244,131	130.1 l/s
Annual (ML/y)	103.5	192.2	162.6	270.5	101.8	256.2	436.9	96.9	1.5	241.9	23.4	164.6	**2,052**	

SCHEDULE “C” - Beaver Lake Service Area/Alignment of Water Transmission Main



Beaver Lake Service Area (BLSA) - Water

Legend

- DLC Glenmore Booster-PRV Station
- Bulk Meter Locations
- DLC to Kelowna Supply Mains
- CoK Water Mains
- Lot Lines
- BLSA Boundary
- IR # 7
- City Boundary
- Assumed Future Boundary Adjustment as per MOU
- Assumed Future Land Transfer as per MOU

City of Kelowna

0 100 200 300
Meters

January 2023

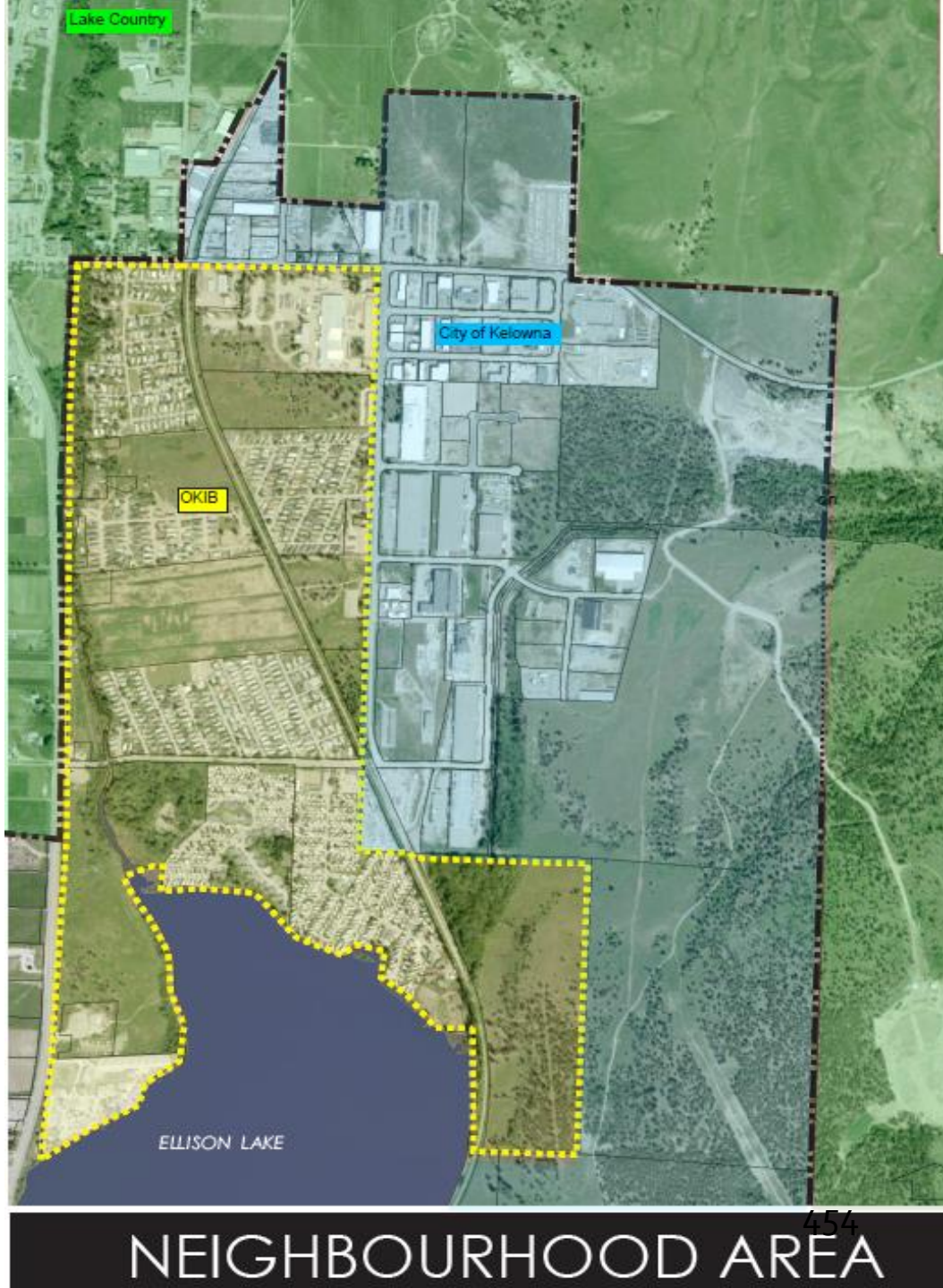
Water and Sewer Agreements

with Okanagan Indian Band

April 24, 2023

Outline

- Legal Agreements overview
- OKIB Water & Sewer Agreements
- Rail Trail Access Agreement
- Questions

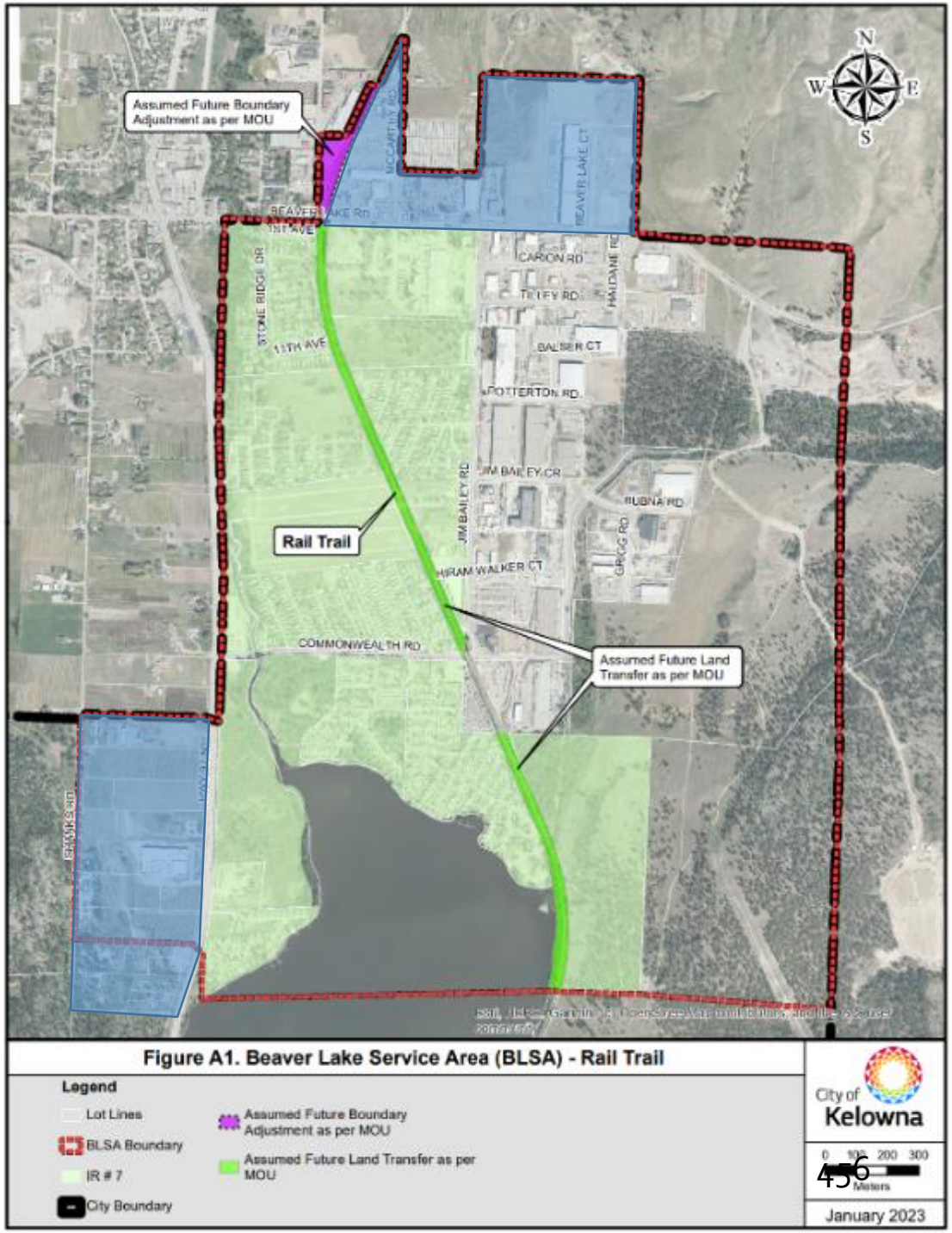


Legal Agreements from MOU

Ref #	Description	Stage
1	Bulk Water. Kelowna & DLC	Approved, awaiting signature
2 & 3	Water and Sewer. Kelowna & OKIB	Subject of this report
4a	Sewer Permit. Kelowna, OKIB & Canada	Complete
4b	Rail Trail Permit. Kelowna & OKIB	Subject of this report
4c	Commonwealth Road Permit. Kelowna & OKIB	Development commencing Q2 2023
5	Wastewater Service. Kelowna & DLC	Approved, awaiting signature
	Future Agreements	
6	Beaver Lake Road. Kelowna, OKIB & DLC	Planned to commence in 2024
7	Municipal Boundary Adjustment. Kelowna & DLC	Preliminary discussion stage

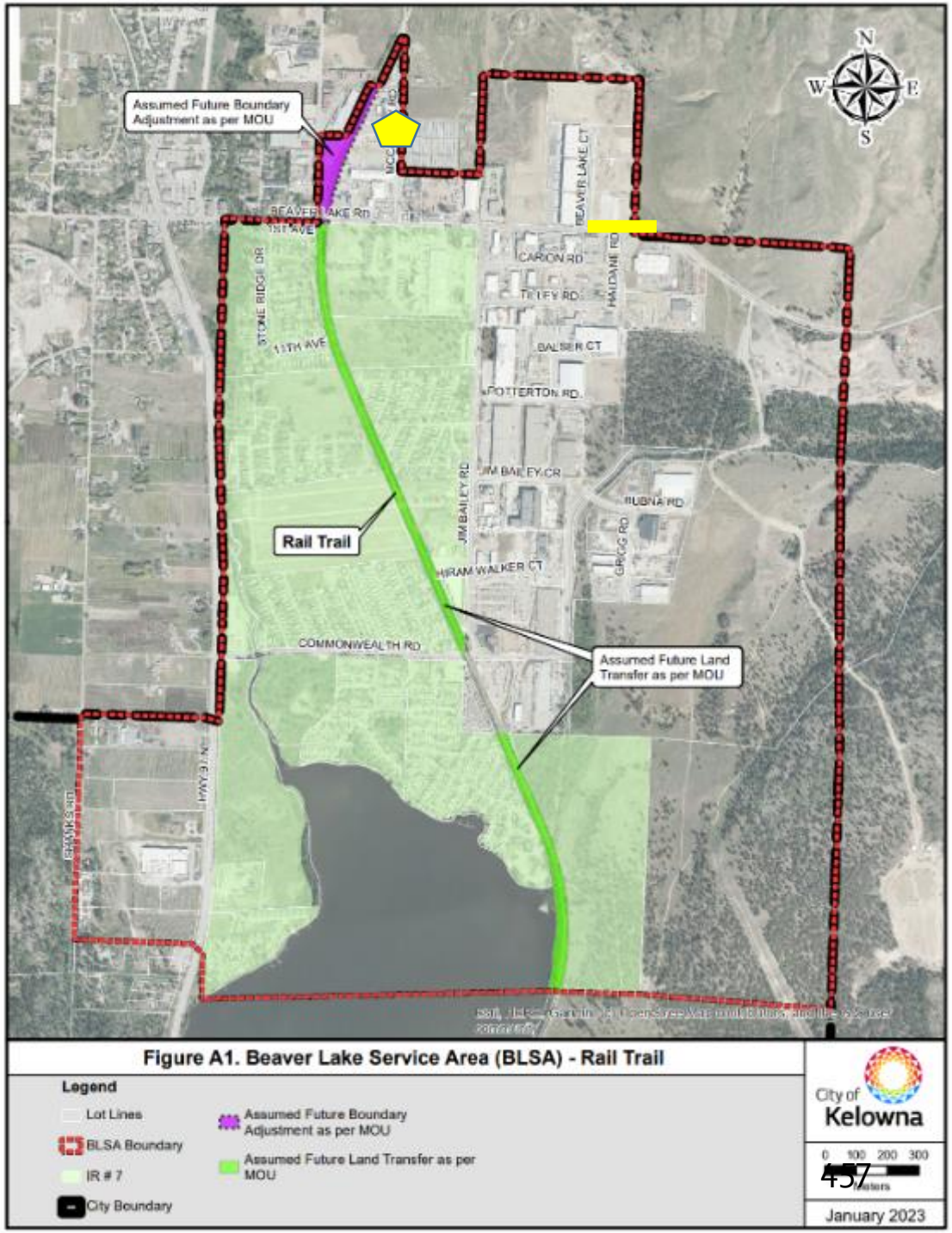
Water Agreement

- Service Area
  - OKIB Indian Reservation #7
  - Adds properties within Kelowna that are mostly on well service
- Formal servicing agreement for properties who choose to connect
- Ensures properties have access to water quality consistent with Canadian standards
- Ensure properties have fire flow supply
- Replaces previous individual agreements
- Plans for new development



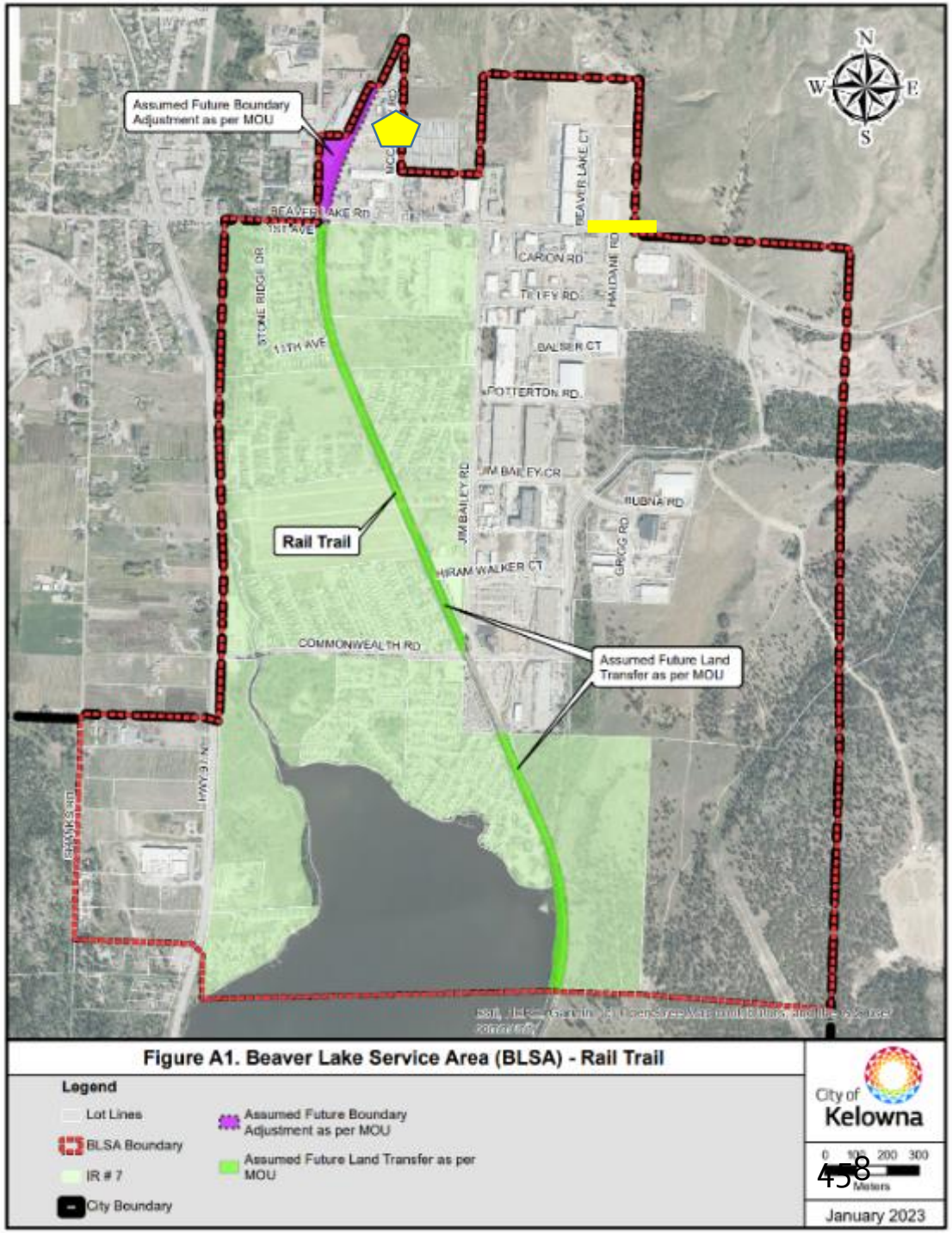
Sewer Agreement

- Service Area
  - OKIB Indian Reservation #7
  - Adds properties within Kelowna that are mostly on septic service
- Formal servicing agreement between the parties who choose to connect
- Improves ground water quality
- Plans for new development



Rail Trail Agreement

- Takes effect after Canada transfers the former rail ROW to OKIB
- Provides public use of OKIB lands for current Rail Trail uses
- Sets conditions of maintenance
- Combines with utility use of lands as well



Rail Trail Next Steps

- Land transfer from Govt. of Canada to OKIB
- Rail Trail agreement signed
- Construction commences

Thank you

Questions?

CITY OF KELOWNA

BYLAW NO. 12501

Amendment No. 1 to the Five Year Financial Plan 2022-2026 Bylaw No. 12338

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. THAT the Five Year Financial Plan 2022-2026 Bylaw No. 12338 be amended by deleting Schedule "A" in its entirety and replacing with them new Schedule "A" as attached to and forming part of this bylaw;

2. This bylaw may be cited for all purposes as Bylaw No. 12501 being "Amendment No. 1 to the Five Year Financial Plan Bylaw, 2022-2026, No. 12338."

Read a first, second and third time by the Municipal Council this 17th day of April, 2023.

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

Schedule "A"
Financial Plan 2022 - 2026

	2022 Amended Budget	2022	2023	2024	2025	2026	2027-2030
Revenue							
Property Value Tax	167,107,316	167,107,316	179,522,375	191,801,552	204,813,609	215,669,897	940,159,269
Library Requisition	7,044,000	7,044,023	7,184,903	7,328,602	7,475,174	7,624,677	32,054,448
Parcel Taxes	6,968,388	3,420,974	3,941,636	3,965,038	3,804,203	3,456,841	12,662,470
Fees and Charges	149,430,006	150,005,535	213,977,187	225,910,172	239,006,280	246,465,323	1,063,681,066
Borrowing Proceeds	7,117,811	7,158,600	-	26,053,200	10,560,000	-	3,830,000
Other Sources	102,632,669	77,169,881	70,729,573	59,588,315	55,953,135	60,148,606	276,738,529
	440,300,190	411,906,329	475,355,674	514,646,879	521,612,401	533,365,344	2,329,125,782
Transfer between Funds							
Reserve Funds	2,514,347	2,319,917	1,018,987	1,018,987	1,018,987	1,018,987	4,075,949
DCC Funds	39,553,199	37,425,860	28,264,914	34,031,463	36,559,002	35,863,936	165,616,918
Surplus/Reserve Accounts	240,632,423	206,914,336	78,307,796	52,726,789	65,029,541	56,828,498	207,146,830
	282,699,969	246,660,113	107,591,697	87,777,239	102,607,530	93,711,421	376,839,697
Total Revenue	**723,000,159**	**658,566,442**	**582,947,371**	**602,424,118**	**624,219,931**	**627,076,765**	**2,705,965,479**
Expenditures							
Municipal Debt							
Debt Interest	3,702,099	3,694,690	4,162,325	6,044,860	8,532,854	10,050,872	39,490,366
Debt Principal	9,593,546	8,847,932	7,654,270	7,885,874	10,911,346	13,248,530	48,035,228
Capital Expenditures	330,494,687	273,558,700	155,020,452	154,084,439	148,709,078	133,443,167	576,459,501
Other Municipal Purposes							
General Government	37,103,554	35,548,877	39,501,887	40,473,724	41,466,844	42,621,132	182,734,891
Planning, Development & Building Services	34,256,816	33,173,416	26,023,038	26,596,068	27,400,651	27,371,013	119,155,373
Community Services	98,904,869	99,961,295	103,041,317	106,205,449	109,481,906	112,688,935	485,206,409
Protective Services	94,740,432	90,581,801	84,395,912	89,607,971	94,403,331	98,854,158	430,467,334
Utilities	27,123,959	25,659,161	23,515,668	24,184,209	25,281,998	25,981,311	111,405,897
Airport	19,974,967	19,974,967	30,114,952	31,423,042	32,757,421	35,275,058	150,430,052
	655,894,929	591,000,839	473,429,821	486,505,636	498,945,430	499,534,177	2,143,385,050
Transfers between Funds							
Reserve Funds	28,860,451	28,603,562	30,285,675	30,427,080	30,193,089	31,158,937	124,289,996
DCC Funds	-	-	-	-	-	-	-
Surplus/Reserve Accounts	38,244,779	38,962,041	79,231,875	85,491,402	95,081,412	96,383,651	438,290,433
	67,105,230	67,565,603	109,517,550	115,918,482	125,274,501	127,542,588	562,580,429
Total Expenditures	**723,000,159**	**658,566,442**	**582,947,371**	**602,424,118**	**624,219,931**	**627,076,765**	**2,705,965,479**

CITY OF KELOWNA

BYLAW NO. 12513

Amendment No. 11 to Miscellaneous Fees and Charges Bylaw No. 9381

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts that the City of Kelowna Miscellaneous Fees and Charges Bylaw No. 9381 be amended as follows:

1. THAT Miscellaneous Fees and Charges Bylaw No. 9381 be amended by adding the following to Schedule "A" in its appropriate location:

   " 17. Non-Refundable Credit Card
   Processing Fee for Property Tax Payments 2.3% of transaction amount".

2. This bylaw may be cited for all purposes as "Bylaw No. 12513, being Amendment No. 11 to Miscellaneous Fees and Charges Bylaw No. 9381."

3. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first, second and third time by the Municipal Council this 17th day of April, 2023.

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

CITY OF KELOWNA

BYLAW NO. 12512
Amendment No. 23 to Subdivision, Development and Servicing Bylaw No. 7900

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts that the City of Kelowna Subdivision, Development and Servicing Bylaw No. 7900 be amended as follows:

1. THAT **SCHEDULE 4 – GENERAL** be amended by deleting "Policy 266 (Approved Products List) and replace it with "Approved Products List";

2. AND THAT **SCHEDULE 4 – GENERAL** be amended by adding the following after "Policy 266 (Approved Products List)":

   "**Delegation of Authority for Approved Products List**

   Provided that all necessary prerequisites of the *Community Charter* the *Local Government Act,* other applicable federal and provincial enactments, City bylaws, and City policies have been met, the General Manager, Infrastructure is assigned the authority to approve and amend the Approved Products List on behalf of the City";

3. AND THAT **SCHEDULE 4 – Section 0.0 General Design Considerations, 0.1 General** be amended by deleting "Policy 266 (Approved Products List)";

4. AND THAT **SCHEDULE 4, Section 5 Roadway Lighting, 5.2 Codes, Rules Standards and Permits, 5.2.2** be amended by deleting "266";

5. AND THAT **SCHEDULE 4, Section 7 Landscape and Irrigation, 7C.1 (x) General Irrigation Requirements** be amended by deleting "Policy 266";

6. AND FURTHER THAT **Schedule 5, CONSTRUCTION STANDARDS, Section 1. CONSTRUCTION SPECIFICATIONS, 2.1 General, 2.1.2** be amended by deleting "See Council Policy 266" and replace it with "See Approved Products List".

7. This bylaw may be cited for all purposes as "Bylaw No. 12512, being Amendment No. 23 to Subdivision, Development and Servicing Bylaw No. 7900."

8. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first, second and third time by the Municipal Council this 17th day of April, 2023.

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk