



Stage 1 Preliminary Site Investigation Lake Front Acreage Property on the East Side of Comox Lake Cumberland, British Columbia



PRESENTED TO
Comox Valley Regional District

AUGUST 23, 2016
ISSUED FOR REVIEW
FILE: 704-ENV.VENV03202-01

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 EBA or destroyed.

EXECUTIVE SUMMARY

Tetra Tech EBA Inc. (Tetra Tech EBA) was retained by the Comox Valley Regional District (CVRD) to conduct a Stage 1 Preliminary Site Investigation (PSI) of a lake front acreage property on the east side of Comox Lake in Cumberland, British Columbia (herein referred to as the "Property"). The Property is 142 acres and consists of 25 cabins. This Stage 1 PSI is being conducted for due diligence purposes prior to the potential purchase of the Property.

Based on information reviewed during this Stage 1 PSI, the Property has been occupied by cabins, cottages and homes since at least 1912. In 1891 the No. 4 Coal Mine operated on a portion of the Property; and a second entrance to the mine, Scott's Slope, was opened on the northern portion of the Property, west of White's Bay in 1926. The mine was closed in 1935 when a severe storm flooded the mine. While in operation coal was screened at the tippie at the main pithead of the No. 4 Mine. From 1935 onwards, after the decommissioning of the No. 4 Mine, Scott's Slope, and associated facilities; the Property remained largely unchanged with the exception of minor changes to the cabins, cottages and homes along the Comox Lake.

The surrounding area has been vacant and forested since circa 1889 when the No. 4 coal mine was developed. Around this time cabins began appearing along Comox Lake. The Puntledge River was dammed in 1911 and the water level of Comox Lake was raised. The Comox Logging and Railway Company operated a logging camp and logging rail line at the head of the lake until circa 1940. A dry land log sort was present at the former logging camp until circa 1996; from circa 2005 onwards the site has been used by the Courtney Fish & Game Association as a firing range, boat launch and campsite. The Cumberland Lake Park was constructed in 1929 at Jock's Point. The Comox Valley Waste Management Centre first appears to have its current landfill cell cleared and developed circa 1984. A gravel pit located approximately 100 m east of the Property servicing the local logging roads has been in service since circa 1946.

During the preparation of this Stage 1 PSI, Tetra Tech EBA considered the information reviewed to assess the present conditions and historical site activities at the Property and all adjacent sites in the context of evaluating potential environmental concerns. Based on the findings described in this Stage 1 PSI, two APECs were identified on the Property. The following table lists the APECs and their associated Potential Contaminants of Concern (PCOCs):

APEC Summary

APEC/Site Activity		PCOCs
APEC 1	No. 4 Mine, coal tailings and mining activities	LEPH, HEPH, PAHs, metals, chlorinated phenols and associated regulated soil vapour parameters
APEC 2	Scott's Slope mining activities	LEPH, HEPH, PAHs, metals, chlorinated phenols and associated regulated soil vapour parameters

Notes:

LEPH – Light Extractable Petroleum Hydrocarbons
HEPH – Heavy Extractable Petroleum Hydrocarbons
PAHs - Polycyclic Aromatic Hydrocarbons

Further investigation in the form of a Stage 2 PSI is recommended to address all of the APECs identified above.

Tetra Tech EBA also identified minor trash and an abandoned car near the No. 4 Mine pithead as an environmental issue. Tetra Tech EBA recommends removing the vehicle and minor trash to prevent any potential future environmental impacts to the Property.

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LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of the Comox Valley Regional District and their agents. Tetra Tech EBA Inc. (Tetra Tech EBA) 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 the Comox Valley Regional District, 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 report is subject to the terms and conditions stated in Tetra Tech EBA's Services Agreement. Tetra Tech EBA's General Conditions are provided in Appendix A of this report.

1.0 INTRODUCTION

1.1 General

Tetra Tech EBA Inc. (Tetra Tech EBA) was retained by the Comox Valley Regional District (CVRD) to conduct a Stage 1 Preliminary Site Investigation (PSI) of a lake front acreage property on the east side of Comox Lake in Cumberland, British Columbia (herein referred to as the "Property"). The Property is 142 acres and consists of 25 cabins. This Stage 1 PSI is being conducted for due diligence purposes prior to the potential purchase of the Property.

The objective of the Stage 1 PSI is to assess the potential presence of contaminants, hazardous materials, or waste materials of a deleterious nature on the Property. The present and past activities at the Property and at the surrounding sites were reviewed to establish the potential for significant adverse impacts (if any) on the environmental status of the Property. This review was limited to the activities presented in the following sections of the report. Much of this review involved the interpretation of acquired historic documents and discussions with individuals with purported knowledge of the subject. Such sources of information are not exhaustive or reliable to a level of certainty. Moreover, while Tetra Tech EBA is skilled at preparing the technical aspects of Stage 1 PSIs, we do not consider ourselves to be expert in assessing the reliability of witnesses or the accuracy, availability, completeness or reliability of historic documents and information.

In our report, we refer to potential sources of contamination as 'issues'. Any issues that have a moderate or high potential to result in soil, groundwater, sediment, air, and/or soil vapour concentrations exceeding the applicable provincial standards are termed Areas of Potential Environmental Concern (APECs). The regulated chemicals associated with contamination sources in each APEC are termed Potential Contaminants of Concern (PCOCs). If any APECs are identified in the Stage 1 PSI, a sampling investigation in the form of a Stage 2 PSI will be recommended to confirm the presence or absence of the PCOCs. If known contaminants of concern (COCs) are identified on the property, an investigation in the form of a Detailed Site Investigation would be conducted in order to determine the extent of contamination.

Tetra Tech EBA received written authorization from the CVRD to proceed with the Stage 1 PSI on July 20, 2016.

1.2 Scope of Work

The scope of work for the Stage 1 PSI included the following:

- Visually observing the Property and the surrounding sites to identify evidence and sources of possible contamination or environmental impairment, and to assess the presence and specific locations of any critical environmental features;
- Reviewing the following historical records: aerial photographs, city directories (if available), historical fire insurance maps (if available), and previous investigative reports to assess historical occupancy and activities on the Property and surrounding sites;
- Collecting information pertaining to environmental concerns about the Property from the Ministry of Environment, CVRD and the Village of Cumberland;
- Reviewing available published geological and hydrogeological information;
- Interview available individuals to obtain information concerning past and current operating practices; and

- Providing a report that summarizes our opinion respecting the likelihood of contamination on the Property based on our review of the information detailed within this report.

The scope of work for the Stage 1 PSI specifically excluded the sampling of soil, groundwater, sediment, air, and soil vapour for environmental purposes. The protocol followed to complete the Stage 1 PSI conformed to the requirements of the MoE Technical Guidance Document 10 on Contaminated Sites, *“Checklist for Reviewing a Preliminary Site Investigation”*¹, and the Society of Contaminated Sites Approved Professionals (CSAP) of British Columbia *“CSAP Practice Guidelines: Numerical – Stage 1 PSI (Draft)”*².

2.0 SITE DESCRIPTION

2.1 Current Legal Description and Location

The Property is located in the Village of Cumberland, BC. A Property location plan is shown on Figure 1.

The legal description of the Property is:

- Parcel Identifier (PID): 006-687-393
- Fractional Section 28, Township 10, Comox District, Plan 552H. Together with that portion of the bed of Comox Lake included with the area shown outlined in red on plan deposited under DD 1983 except in plans 21 RW, 788 RW, 26178 and VIP57417.

The current owners of the Property are the Comox Land Corporation. The current land title and legal survey plan are provided in Appendix B.

2.2 Location

The civic address, current municipal zoning, official community plan designation (OCP), and cartographic co-ordinates for the center of the Property are presented in Table 1 below. A zoning map for the Property area in Cumberland are attached in Appendix C.

Table 1: Parcel ID, Civic Address, and Municipal Information

Parcel ID	Civic Address	Municipal Zoning	OCP	Latitude	Longitude
006-687-393	East Side of Comox Land, Cumberland, BC	UR-1	RE-1	49° 37' 55.48" N	125° 04' 13.78" W

Notes:

UR-1 – Upland Rural One

MU4B – Recreation and Tourism

The current use of the Property for cabins is legally nonconforming to the Village of Cumberland current zoning bylaw. The Village of Cumberland is in the process of updating their zoning bylaw which is currently out for public consultation. The proposed updated zoning would permit single family dwelling and vacation rental.

¹ October 2005.

² June 2015.

2.3 Potable Water Supply

Potable drinking water is supplied to the residents of Cumberland from reservoirs that are located south of the Property (the fresh water supplies come from the reservoirs at Allen Lake and Henderson Lake; approximately 4 and 3 km south of the Property respectively). The cabins on the Property are supplied potable water from a mix of local water wells, lake extraction from Comox Lake and bulk shipping in of potable water. The Comox Lake is used as a water source for the residents of the Comox Valley; water originates in Comox Lake and is taken from the Puntledge River approximately 3 km north of the Property.

2.4 Current Property Facilities

Mr. Darren Thomas of Tetra Tech EBA, visited the Property on August 3, 2016. Mr. Kenneth Cottini, from the Comox Land Corp. Board of Directors, was also present during the site reconnaissance.

The site reconnaissance involved a visual inspection of the surface of the Property, including any stains or suspect materials on-site, a limited visual review of accessible areas and an assessment of the current conditions of vegetated areas on the Property. A walkover was conducted on neighbouring properties via publicly accessible areas to assess if there were any environmental concerns with the potential to adversely impact the soil and groundwater quality beneath the Property. Selected photographs from the Property visit are presented in the Photograph Log at the end of the report.

The Property area is approximately 574,654 m² (including approximately 121,406 m² of lake bed) and roughly 95% of the area is vacant and forested; the remainder contained 25 cabins, cottages and homes in two areas on the south and north ends of the Property. The former No. 4 coal mine extends beneath the Property, two entrances to the mine are on the Property (No. 4 mine main pit head and Scott's Slope) as discussed below and as shown on Figure 4.

Cabins, Cottages and Homes

Cabins, cottages and homes occupy an approximately 42,700 m² portion of the southwest corner of the Property; and a further approximately 14,000 m² portion of the Property adjacent to Comox Lake south of White's Bay as shown in Figure 4. Mr. Cottini reports that 6 to 8 of the cabins are occupied year-round and the remainder are seasonally occupied. The cabins vary in age with the oldest reportedly being approximately 100 years of age. The cabins are heated by a mix of electrical base boards, propane furnaces and wood burning stoves. Power is supplied by overhead lines to the cabins on the southern portion of the Property, while no power is supplied to the cabins on the northern portion. The cabins dispose of sewage into a mix of individual and shared septic fields, pit toilets and holding tanks. Waste generated by the residents is placed in a dumpster located on the south end of the Property collected at regular intervals by Progressive Waste Solutions.

Mr. Cottini reports that the Comox Land Corp. does not allow any businesses (such as boat repair) to take place on the Property, and that no on dock refuelling is permitted.

Tetra Tech EBA observed two suspended above ground tanks at the northern cabins. These home heating oil style tanks were reportedly used for potable water storage only. Jerry cans for outboard motors and small electric generators were observed at several cabins; Tetra Tech EBA did not note any other significant fuel or chemical storage. Tetra Tech EBA did not observe any stained soil or distressed vegetation at the cabins.

Vacant and Vegetated Areas

The remaining portions of the Property were vacant and forested. A portion of the land was logged in 2001 and is in a current state of regrowth. Mr. Cottini reported that trespass and illegal campers are a problem for the vacant areas of the Property. Tetra Tech EBA observed minor residential trash and campfire pits along the vacant areas of the Comox Lake shoreline, and an abandoned car near the former No. 4 coal mine. Portions of the former No. 4 coal mine area and tailings rows are frequently used by trespassers as a BMX park.

No. 4 Coal Mine

The former No. 4 coal mine extends beneath the Property; and an approximately 118,400 m² area north of Perseverance Creek, both on and adjacent to the Property, contains coal mining tailings rows and remnants of the former coal mining infrastructure for the main pit head, as shown on Figure 4. Tetra Tech EBA observed rows of coal mining tailings approximately 2 m high and 4 m wide running the entire length of the area from Perseverance Creek to the bluff where the No. 4 Fan House was located. The beach fronting the former No. 4 mine area is black and has evidence of coal tailings. Tetra Tech EBA also observed the remnants of tracks heading towards Scott's Slope, the concrete foundation and walls of the former No. 4 mine fan house, and the adjoining collapsed fan shaft.

Mr. Cottini reported that the area encompassing the No. 4 mine surface facilities is subject to a restrictive covenant forbidding altering the land in any way, as discussed in Section 4.2.

Scott's Slope

Tetra Tech EBA accessed the area of Scott's Slope, on the northern portion of the Property and west of White's Bay by boat as the area was heavily vegetated. Scott's Slope is reportedly a secondary entrance to the No. 4 mine. Tetra Tech EBA observed the collapsed entrance to Scott's Slope and the foundation of an adjoining substation. Mr. Cottini reported that no other former structures were observed when the area was logged in 2001/2002. Tetra Tech EBA understands that no coal washing or processing took place at this location and did not observe any coal dust or tailings in this area; however the heavily vegetated nature of the site makes a complete assessment impossible.

2.5 Interviews

Mr. Kenneth Cottini was present for an interview during the site visit. Information obtained from Mr. Cottini has been included in the appropriate sections of this report.

2.6 Above-Ground or Underground Storage Tanks

Tetra Tech EBA assessed the Property for indications of above-ground storage tanks (ASTs) and/or underground storage tanks (USTs), which included suspect vent or filler pipes, fuel lines, stained areas, and field evidence of stressed vegetation (if any). Cabins on the southern portion of the Property are on septic fields with buried holding tanks as shown in the attached Photos 3 and 4. No other visual evidence suggesting the presence of USTs was noted at the Property during the inspection.

Tetra Tech EBA observed two approximately 275 gallon home heating oil style tanks at the northern cabins. These tanks were reportedly used for potable water storage only. Tetra Tech EBA also observed an aluminum suspended approximately 200 gallon water tank and two approximately 420 lb propane tanks at the northern cabins.

2.7 Fill Material

Since the Property appeared to have been developed on the natural contours of the surrounding land, it is unlikely that fill material was brought on to the Property during construction. Fill soils are typically suspect if their origin is not known, as some fill soils may have been imported from contaminated sources.

2.8 Special Attention Items

Prior to the discovery of their potentially hazardous effects on human health and/or the environment, Special Attention Items were historically used in certain building materials. These Special Attention Items include, but are not limited to, polychlorinated biphenyls, asbestos-containing building materials, lead, urea formaldehyde foam insulation, ozone-depleting substances, mould, and/or mercury.

The potential presence of Special Attention Items based on the age of the Property buildings (circa 1912) are listed in Table 2. Tetra Tech EBA did not view all buildings on site and examined the building exteriors only. Further information regarding potential sources and implications of these issues are summarized in Appendix F.

Table 2: Special Attention Items

Special Attention Items	Potential Sources	Suspected on Property
Polychlorinated Biphenyls (PCBs)	- Commonly used in electrical equipment. - Potential sources include, but are not limited to, capacitors in fluorescent light ballasts, transformers, and/or other electrical capacitors.	Yes, common prior to 1980.
Asbestos-Containing Materials (ACMs)	- Commonly present in materials used in the construction of structural, mechanical and architectural finishes. - Potential sources include, but are not limited to, vinyl floor tiles and vinyl sheet flooring, ceiling tiles, plaster, drywall joint compounds, spray-applied and blown-in insulations, electric wiring insulation, pipe insulation, elevator equipment panels, and as insulation on mechanical systems.	Yes, common prior to 1980.
Lead	Potential sources include, but are not limited to, lead-based paint, lead pipes, welding beads and lead metal sound absorbers.	Yes, common in paint prior to 1980.
Ozone-Depleting Substances (ODS)	- Chlorofluorocarbons (CFCs), which were used in refrigerants in refrigerators and air-conditioners (FREON, CRC-113, or R-12), propellants in aerosol spray cans, blowing agents in the manufacture of foams, and cleaning agents for electronic equipment. - Hydrochlorofluorocarbons (HCFs), which were used as substitutes for CFC refrigerants and blowing agents. - Carbon tetrachloride and methyl chloroform, which are used as cleaning solvents for metals. - Halons, which are used in fire extinguishing systems. - Methyl bromide, which are used as an agricultural pesticide and to fumigate agricultural commodities.	No
Urea Foam Formaldehyde Insulation (UFFI)	- Made of urea-formaldehyde resin, a foaming agent, and compressed air. - Used to insulate wall and ceiling cavities in building walls.	Yes, common prior to 1980.

Table 2: Special Attention Items

Special Attention Items	Potential Sources	Suspected on Property
Mould	Water incursion within buildings.	Yes – several cabins appear to have been vacant with minimal maintenance for years.
Elemental Mercury	Potential sources include, but are not limited to, mercury-containing thermostats, paint and as vapour in fluorescent lamps.	Yes, common in prior to 1980.
Other conditions	Includes noise, vibration, and electric and magnetic fields.	No
Radon	Naturally occurring radioactive materials (NORM) in certain geological formations	Not known to be an issue in this area

2.9 Surrounding Sites

During the site visit, publicly accessible or visible portions of surrounding sites were viewed by Tetra Tech EBA to identify potential environmental concerns (if any) capable of impacting the environmental status of the Property. See Table 3 below and Figure 2 for the Surrounding Land Use Plan.

Table 3: Current Surrounding Sites

Direction	Address	Current Tenants and Environmental Observations
North (inferred cross-gradient) ³	N/A	To the north of the Property are vacant forestry lots in a state of regeneration. Approximately 3 km north of the Property on the Puntledge River is the Puntledge Dam and hydroelectric facility.
Northwest (inferred down/cross-gradient)	N/A	To the northwest of the Property is the Courtney Fish & Game Protective Association shooting range and camping facilities. Additionally, approximately 300 m down the Puntledge River is the Comox Dam.
West (inferred down-gradient)	N/A	West of the Property is Comox Lake. On the south side of the lake approximately 600 m from the Property is Cumberland Lake Park Campground.
South (inferred up/cross-gradient)	2007, 2031, 2040, 2042, 2048, 2051, 2054 and 2079 Comox Lake Road	To the south of the Property are several residences and the Beaufort Mountain Range.
East (inferred up-gradient)	N/A	To the east of the Property are vacant forestry lots in a state of regeneration. Approximately 100 m east of the Property, adjacent to Perseverance Creek is a small gravel pit used for logging road maintenance. Approximately 860 m east of northeast corner of the Property is the Comox Valley Waste Management Centre and landfill.

³ With respect to the inferred groundwater flow direction, west. See Section 3.2 for further details.

2.10 Previous Environmental Investigations

Tetra Tech EBA reviewed the following previous report that was provided by the CVRD. The report details are provided in Table 4 below.

Table 4: Previous Reports

Report	Title	Date
1	"Valuation of Lake Front Acreage Property SITUATED AT East Side of Comox Lake, Cumberland, BC". Prepared by Dan Wilson, Wm. S. Jackson & Associates Ltd. Real Estate Appraisers & Consultants for the Comox Valley Regional District.	March 2016

Tetra Tech EBA reviewed the report for information relevant to this Stage 1 PSI, including potential sources of contamination that could result in soil, groundwater, sediment, and/or soil vapour contamination at the Property. The purpose of the review was for information purposes only, and not to comment or confirm the adequacy of the report.

Report 1: Valuation of Lake Front Acreage Property SITUATED AT East Side of Comox Lake, Cumberland, BC

The report summarized the current to the time valuation of the Property and included a summary of the Property and adjoining facilities, legal descriptions, land titles and legal lot plans. The report recommended that an Environmental Assessment take place to address historic coal mining activities on the Property. Tetra Tech EBA referenced the report for details relevant to this Stage 1 PSI.

3.0 NATURAL SETTING

3.1 Geological Information

The Geological Survey of Canada Map 92F indicated that the surficial geology in the area of the Property features Hawarth Fluvial Soils consisting of rapidly drained, very gravelly to gravelly loamy sand overlaying very gravelly sand. The surface horizons are usually less than 60 cm in thickness, reddish-brown to strong brown, and strongly acid.

3.2 Topography and Hydrogeology

The topography in the region near the Property generally slopes downward to Comox Lake to the West. Regional groundwater is inferred to flow generally west from the Property based on the topography of the area. A figure showing the elevation contours in the area of the Property is included in Appendix D.

3.3 Streams and Adjacent Waterbodies

Activities on a site have a potential to contaminate sediment in waterbodies that cross through or that are adjacent to the site. Potential contaminants may be transported to the waterbodies by overland flow or groundwater seepage. In addition, sites located upstream from a site have a potential to contaminate the waterbodies passing through or adjacent to the site, which could result in contamination of the Property.

The nearest surface waterbody to the Property is Comox Lake, located immediately adjacent to the west and over portions of the west side of the Property. Additionally, Perseverance Creek crosses the southern portion of the Property; and a portion of the wetlands north of White Bay on Comox Lake is included in the northern portion of the Property. A figure showing the surficial water bodies surrounding the Property is included in Appendix D.

3.4 Climate

Historical climate information for this region was based on data from Environment Canada from the Courtenay Meadowbrook Climate Station (Climate ID: 1101158), located approximately 12.4 km northeast of the Property.

Climate information was provided for the period between 1981 and 2010. According to the information, the rainfall, precipitation, and snowfall and temperature records were as follows:

- Annual Rainfall: 1400.9 mm;
- Highest Monthly Rainfall: 236.4 mm (December);
- Annual Precipitation: 1455.8 mm;
- Highest Monthly Precipitation: 248.5 mm (December);
- Annual Snowfall: 54.9 cm;
- Highest Monthly Snowfall: 15.9 cm (January);
- Average Annual Temperature: 9.7 °C;
- Lowest Daily Average Temperature: January (3.0 °C); and
- Highest Daily Average Temperature: July (17.9°C).

In general, most precipitation falls between October and March, while summers, especially July and August, are relatively dry. Temperatures are generally mild. The warmest month, in an average year, is July and August and the coldest is December and January. Rainfall is expected to infiltrate into exposed soil at the Property and to drain rapidly into Comox Lake.

A copy of the historic climate information is provided in Appendix D.

3.5 Drinking Water Wells

A search of the MoE aquifer and water well database found 10 wells within a 500 m radius from the Property, which is the search radius specified in MoE Protocol 21 for Contaminated Sites, "*Water Use Determination*". Five of the ten wells were within the Property boundary.

A copy of the water well search results for this area obtained from the British Columbia Water Resources Atlas is included in Appendix D.

3.6 Flood Potential

Based on the CVRD iMap tool, the Property is not located within designated floodplain areas. Designated floodplain areas are defined by the MoE as areas within the 200 year flood plain. A copy of the floodplain map is included in Appendix D.

4.0 HISTORICAL RECORDS REVIEW

The following subsections present a summary of the history for both the Property and surrounding land based on a review of available information.

4.1 Historic Property and Surrounding Area Land Uses

The history of the Property was interpreted based on a review of aerial photographs (1946, 1957, 1964, 1968, 1972, 1975, 1980, 1984, 1991, 1996, 2005, 2012, 2014, and 2015) and records from the Village of Cumberland Archives. City directories and fire insurance maps for the Property and surrounding area were requested but not available.

Table 5 contains the results of the historical review. Land uses and occupants considered to have potential to environmentally impact the Property are noted in bold font.

Table 5: Historical Property and Surrounding Land Use Summary

Approximate Duration	Land Use
1889 - 1935	Property - Aerial photographs were not available for this period. - In 1889 prospecting for coal had begun on Comox Lake (then Puntledge Lake, later Cumberland Lake and now Comox Lake). - In 1891 work began on the No. 4 slope of the Lake Mine. The No. 4 Mine spanned 1600 acres on and off the Property. Housing and services for the mine lead to the development of the Village of Cumberland. The Old Colliery Mainline (1889 – 1913) and the Colliery Mainline (post 1913) carried coal by rail from the tippie towards Cumberland. - Fire in 1905 destroyed the blacksmith and machine shops, however the pithead, engine and fan houses were saved. A new pithead and tippie were constructed in 1919. - In 1926 Scott's Slope opened on the north portion of the Property. Scott's Slope was connected to the main pithead by a narrow gauge track. Coal was hauled to the tippie for screening in trips of 30 mine-cars by steam dinky locomotive. - No. 4 Mine was abandoned in 1935 after it flooded with lake water during a heavy storm and was deemed too costly to pump out. - Cabins were built on the lake during this period; while the time of their construction is unclear, they were known to exist during the "Big Strike" in 1912 to 1914. Surrounding Land - Aerial photographs were not available for this time period. - In 1911, in order to increase the depth of the river by about five feet, a dam at the mouth of the Puntledge River was built by Canadian Collieries Ltd. A diversion dam and hydro-electric power plant were then built further down the river to provide power for No. 7 and No. 8 Mines; as well as Cumberland, Courtney, Royston and Union Bay. - The Comox Logging and Railway Company operated a floating A-Frame logging operation which progressed around the Comox Lake shoreline, then became a logging camp at the lake head for the logging railway. The camp became redundant in 1940 when a logging road was built around the west side of Comox Lake. - The Comox Logging and Railway Company operated a railway from the Comox Dam and lake head (now the Courtney Fish & Game Protective Association land) north towards Bevan. - In 1929 Cumberland was granted a number of acres at Jock's Point for a public park (now Cumberland Lake Park and Campground).

Table 5: Historical Property and Surrounding Land Use Summary

Approximate Duration	Land Use
1935 - 1946	Property - No aerial photographs for this time period. - No information from the Cumberland Archive for this period. Surrounding Land - No aerial photographs for this time period. - Circa 1940 a logging road was built around the west side of Comox Lake to the lake head camp.
1946 - Present	Property - Since 1946 aerial photographs show the Property in substantially the same condition. - From 1946 to 1972 log floats can be seen on Comox Lake along the northern portion of the Property, west of White's Bay. - The Scott's Slope trestle line is visible in the 1946 aerial photographs, however does not appear in any subsequent aerial photographs. - Strong tree growth is visible around Scott's Slope and the No. 4 Mine from the 1972 aerial photographs onwards. There is insufficient detail in the aerial photographs to determine the condition of any historical mining structures, or when they may have been demolished. - The Property, excluding the area around the No. 4 Mine, was logged in 2001/2002. Surrounding Land - The adjacent lands were logged sometime between the 2005 and 2012 aerial photographs. - The lake head logging camp appears to be used as a dry land sort from circa 1946 to circa 1996. The site appears vacant and inactive in the 1996 aerial photographs. The Courtney Fish & Game Protective Association first appear to begin developing the land in the 2005 aerial photographs as a firing range, boat launch and camp site; and their facilities appear in their current configuration in the 2012 aerial photographs. - The gravel pit east of the Property for servicing the adjacent logging roads is visible in all aerial photographs from 1946 onwards. - The Cumberland Lake Park and Campsite appears in substantially the same condition in all aerial photographs from 1946 onwards. There is insufficient detail in the aerial photographs to determine any minor changes in the configuration of the park facilities. - While there are activities visible around Pidgeon Lake which may potentially be related to landfilling beginning in the 1964 aerial photographs; The Comox Valley Waste Management Centre first appears to have its current landfill cell cleared and developed in the 1984 aerial photographs. The landfill is presently in the process of constructing new landfill cells east of its current facilities; construction has been ongoing since 2015. - The Comox and Puntledge Dams were acquired by BC Hydro in 1953. The Puntledge Dam was rebuilt in 1955 and further improvements were completed in 1982.

4.1.1 Schedule 2 Activities

Schedule 2 of the CSR lists a number of activities that have a potential to cause contamination. If a zoning, development, removal of soil, or a demolition permit is requested from the Village of Cumberland, then completion of a "Site Profile" may be required. When Schedule 2 activities have historically occurred, the requested

municipal permit may trigger a review by the MoE. If a review were necessary, then a MoE instrument (e.g. Certificate of Compliance) or a release of the permit from MoE would be necessary.

Tetra Tech EBA's review identified current and past Schedule 2 activities on the Property as listed in Table 6 below:

Table 6: Schedule 2 Activities

Operations	Schedule 2 Activity
No. 4 Mine & Scott's Slope	D3 - Coal or lignite mining, milling, wholesale bulk storage or shipping
No. 4 Mine	H14 – Mine tailings waste disposal

4.1.2 Municipal Records Review

Tetra Tech EBA's representative, Mr. Darren Thomas, contacted the Village of Cumberland on July 29, 2016 to request a search for any records pertinent to the Stage 1 PSI and subsequently visited the Village of Cumberland City Hall on August 3rd 2016 to view municipal files for the Property. Concurrently, Tetra Tech EBA contacted the CVRD for any historical records in their possession from when the Property was under their jurisdiction; and was informed that all records were passed to the Village of Cumberland.

The municipal files indicated that a permit was issued for shoreline protection construction completed in 2008. An additional building permit file was missing, which was issued for a fire damaged house at an unknown date.

4.2 Land Titles

Land Titles provided by the CVRD list the registered owner of the Property as the Comox Lake Land Corporation, Inc. No. 627536. The land titles list a restrictive covenant for a portion of the Property described as "Part shown on Plan VIP72864. Appurtenant to that part of Section 28, Township 19, Comox District Plan 552H included in Plan 21RW." The covenant is in favour of West Fraser Mills Ltd. and is registered in the Land Title Office under number ES091929. Tetra Tech EBA understands from Mr. Cottini that this is the area of the historic No. 4 Mine works and tailings. The land valuation report reviewed by Tetra Tech EBA (Report 1) reported the following regarding the restrictive covenant:

- The subject area must not be logged, harvested, or supported by any wells or service infrastructure;
- The subject area must not be subdivided except as one parcel;
- The subject area must not be used for any other purpose than a buffer or screen area and that the property owners shall not build, construct or place any improvements or other structures thereon, and shall not remove any trees or other vegetation therefrom; and
- No hunting, fishing, camping, biking, trail riding, picnicking or other recreational use of or public access over the servient lands may be carried out on the restrictive covenant area, except with prior written consent of the grantee.

The land valuation report also shows areas on the Property which are potentially for sale to the CVRD as well as areas that the Comox Valley Land Corporation would like to keep. The approximate areas are shown on Figure 3.

4.3 British Columbia Online Site Registry Search

The MoE maintains a database called the Site Registry that contains environmental information pertaining to contaminated or potentially contaminated sites. The Site Registry documents milestones in the cleanup process of a site. The Site Registry contains information on sites that have been investigated and cleaned up in British Columbia since 1988 (when MoE began recording this activity). All of the information is accessible to the public.

The Site Registry is *not* a registry solely of contaminated sites. Some sites in the registry are contaminated, but most are simply being investigated and require little, if any, cleanup or they have already been cleaned up to government standards. The lack of information on a particular site does not indicate an absence of contamination, but only an absence of MoE documentation.

The database can be searched on the basis of geographic location or PID. Due to the size of the Property, and in order to capture all sites within 500 m of the Property boundary, Tetra Tech EBA conducted an area search for registered sites in a 10 km radius of the cartographic centre of the Property. The site registry area search resulted in 19 records. The records were considered low risk to the Property due to their distance (900 m or greater) from the Property. The Property itself was not registered in the database.

Copies of the Site Registry search results are included in Appendix E.

5.0 DISCUSSION

The following two subsections discuss the findings of the historical review for the Property and surrounding sites, respectively. Activities with significant potential sources of contamination are termed as 'issues'. Any issues that present a moderate or high likelihood of causing significant soil, soil vapour and/or groundwater contamination above the applicable provincial standards are termed as Areas of Potential Environmental Concern (APECs). Further investigation of any identified APECs would then be recommended as part of a Stage 2 Preliminary Site Investigation or Detailed Site Investigation. No further investigation is recommended for issues that are considered to present a low likelihood of causing significant contamination above the applicable provincial standards.

A table summarizing the APECs and Potential Contaminants of Concern (PCOCs), if any, will be presented in Section 6.0 "Conclusions and Recommendations".

5.1 Property

Based on information reviewed during this Stage 1 PSI, the Property has been occupied by cabins, cottages and homes since at least 1912. In 1891 the No. 4 Coal Mine operated on a portion of the Property; and a second entrance to the mine, Scott's Slope, was opened on the northern portion of the Property, west of White's Bay in 1926. The mine was closed in 1935 when a severe storm flooded the mine. While in operation coal was screened at the tippie at the main pithead of the No. 4 Mine.

From 1935 onwards, after the decommissioning of the No. 4 Mine, Scott's Slope, and associated facilities; the Property remained largely unchanged with the exception of minor changes to the cabins, cottages and homes along the Comox Lake.

During the Stage 1 PSI, Tetra Tech EBA identified three environmental issues on the Property. Two environmental issues were considered to be APECs. The remaining issue was considered a low risk environmental concern. Based on the findings of this Stage 1 PSI, Table 7 below lists the low risk environmental concern, the two APECs and associated PCOCs and rationale:

Table 7: On Property APEC Summary Table

APEC		PCOCs	Comments / Rationale
APEC 1	No. 4 Mine, coal tailings and mining activities	LEPH, HEPH, PAHs, metals, chlorinated phenols and associated regulated soil vapour parameters	Coal mining tailings left on the Property have the potential to leach PCOCs into the surrounding environment in concentrations above the BC Contaminated Sites Regulation. Industrial coal mining activities have the potential to have contaminated the soil and groundwater on the Property. Railways for hauling coal may have had creosote and other wood preservative on the ties.
APEC 2	Scott's Slope mining activities	LEPH, HEPH, PAHs, metals, chlorinated phenols and associated regulated soil vapour parameters	Potential for coal dust and tailings to exist around the Scott's Slope mining activities; which have the potential to leach PCOCs into the surrounding environment in concentrations above the BC Contaminated Sites Regulation. Industrial coal mining activities have the potential to have contaminated the soil and groundwater on the Property. The Scott's Slope trestle bridge and track for hauling coal may have had creosote and other wood preservative on the trestle and ties.
Environmental Issues			
Environmental Issue		Comments / Rationale	
Abandoned car at No. 4 Mine pithead, minor trash from illegal camping and picnicking.		Tetra Tech EBA did not observe any staining or burn marks around the vehicle, and therefore considers the risk of impacts to the ground around the abandoned car to be low. Tetra Tech EBA recommends removing the car and other minor trash to eliminate future risk of contaminating the Property.	

Notes:

LEPH – Light Extractable Petroleum Hydrocarbons
HEPH – Heavy Extractable Petroleum Hydrocarbons
PAHs - Polycyclic Aromatic Hydrocarbons

The locations of the above APECs are shown on the attached Figure 4.

5.2 Surrounding Area

During the Stage 1 PSI, Tetra Tech EBA identified four environmental issues with the Property's surrounding sites: The Comox Logging and Railway Company (circa 1911 to 1940) and dry land log sort (circa 1940 to circa 1996), the Courtney Fish & Game Association firing range (circa 2005 to present); the Comox Valley Waste Management Centre (circa 1964 to present); and an adjoining gravel pit servicing the local logging roads (circa 1946 to present). None of the offsite issues were considered to be an APEC. The environmental issues are outlined in the subsequent Table 8, along with the associated rationale:

Table 8: Surrounding Area Low Risk Environmental Issues Summary Table

Environmental Issue	Comments / Rationale
Comox Logging and Railway Company (circa 1911 to 1940) and dry land log sort (circa 1940 to circa 1996)	Industrial activities which likely took place at the lake head camp and log sort were located a significant distance (greater than 300 m) and cross-gradient to the Property.
Courtney Fish & Game Association firing range (circa 2005 to present)	The firing range has is sufficiently distant (greater than 100 m) from the Property and has only been in operation for approximately 11 years. Tetra Tech EBA considers the risk of lead and other metals leaching into the soil and migrating to site to be low at this time.
Comox Valley Waste Management Centre (circa 1964 to present)	The landfill is a significant distance (greater than 800 m) from the Property.
Gravel Pit adjacent to the Property (circa 1946 to present)	The gravel pit is sufficiently distant (greater than 100 m) from the Property. There was no evidence of stained soils or distressed vegetation at the gravel pit or evidence of equipment or fuel storage.

6.0 CONCLUSIONS AND RECOMMENDATIONS

During the preparation of this Stage 1 PSI, Tetra Tech EBA considered the information reviewed to assess the present conditions and historical site activities at the Property and all adjacent sites in the context of evaluating potential environmental concerns. Based on the findings described in this Stage 1 PSI, two APECs were identified on the Property or the surrounding area. Table 9 below lists the APECs and their associated PCOCs and they are also shown on Figure 4.

Table 9: APEC Summary

APEC/Site Activity		PCOCs
APEC 1	No. 4 Mine, coal tailings and mining activities	LEPH, HEPH, PAHs, metals, chlorinated phenols and associated regulated soil vapour parameters
APEC 2	Scott's Slope mining activities	LEPH, HEPH, PAHs, metals, chlorinated phenols and associated regulated soil vapour parameters

Notes:

LEPH – Light Extractable Petroleum Hydrocarbons
 HEPH – Heavy Extractable Petroleum Hydrocarbons
 PAHs - Polycyclic Aromatic Hydrocarbons

Further investigation in the form of a Stage 2 PSI is recommended to address all of the APECs identified above.

Tetra Tech EBA also identified minor trash from trespassers and an abandoned car near the No. 4 Mine pithead as an environmental issue. Tetra Tech EBA recommends removing the vehicle and trash to prevent any potential future environmental impacts to the Property.

Tetra Tech EBA also identified the potential presence of Special Attention Items based on the age of the Property buildings (circa 1912). These Special Attention Items include, but are not limited to, polychlorinated biphenyls, asbestos-containing building materials, lead, urea formaldehyde foam insulation, ozone-depleting substances, mould, and/or mercury. A hazardous building materials survey should be conducted prior to the renovation or demolition of any structures on the Property.

7.0 QUALIFICATIONS OF ASSESSORS

Ms. Lora Paul, P.Eng. - Ms. Paul is a senior project manager with Tetra Tech EBA and conducted the senior review of this report. Ms. Paul has over 15 years of experience in contaminated sites work in British Columbia.

Mr. Darren Thomas, EIT., –Mr. Thomas has over five years of contaminated sites experience including Stage 1 and 2 PSIs, Phase I and II ESAs, and various field-based projects. Mr. Thomas has authored over 50 environmental investigation reports. Mr. Thomas conducted the historical records review, the interviews and site visit portions of the project and prepared this report.

8.0 CLOSURE

Tetra Tech EBA trusts that this report satisfies your present requirements. Should you have any questions or comments, please contact our office at your convenience.

Respectfully submitted,
Tetra Tech EBA Inc.

ISSUED FOR REVIEW

ISSUED FOR REVIEW

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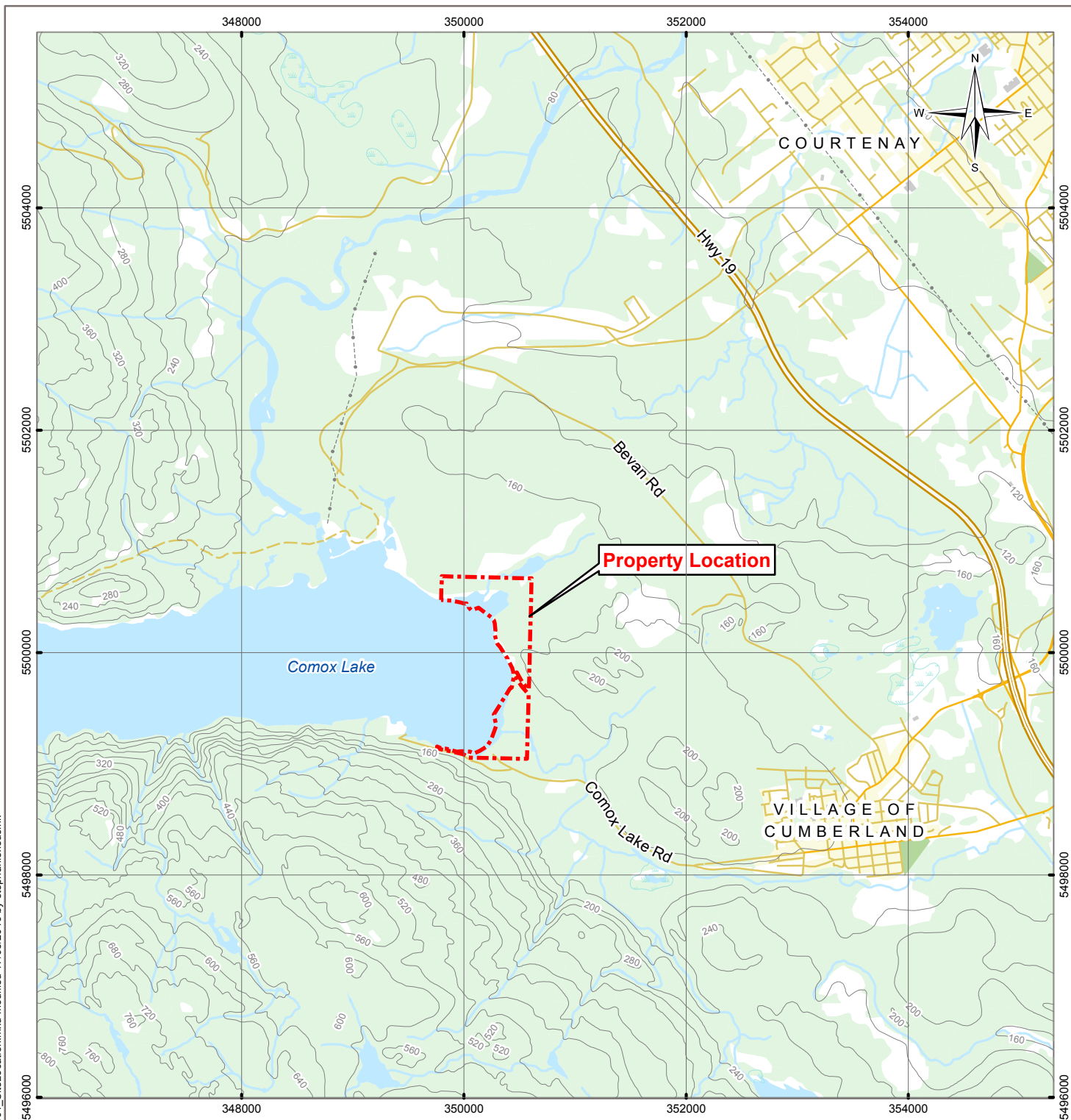
REFERENCES

- BC Environmental Management Act (2014) *Contaminated Sites Regulation*, BC Reg. 375/96 including amendments up to BC Reg. 4/2014, January 31, 2014.
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FIGURES

- Figure 1 Property Location Plan
- Figure 2 Property and Surrounding Land Use Plan
- Figure 3 Comox Land Corporation Land
- Figure 4 Property Plan and APECs

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LEGEND

- Property Location (approximate)
- Highway
- Main Road
- Local Road
- Resource/Recreational Road
- Power Line
- Building
- Park
- Residential Area
- Contour (40 m)
- Watercourse
- Waterbody
- Wetland
- Wooded Area

NOTES

Base data source: CanVec 1:50,000.

STATUS

ISSUED FOR REVIEW

STAGE 1 PSI LAKE FRONT ACREAGE PROPERTY ON COMOX LAKE

Property Location Plan

PROJECTION

UTM Zone 10

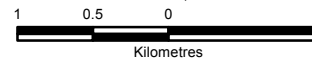
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NAD83

CLIENT

Comox Valley
Regional District

Scale: 1:50,000



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OFFICE

Tt EBA-VANC

DATE

August 17, 2016

Tt TETRA TECH EBA

Figure 1

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LEGEND

Property Location (approximate)

Local Road

Resource/Recreational Road

NOTES

Base data source:
Imagery from Google; DigitalGlobe (2015).

STATUS
ISSUED FOR REVIEW

STAGE 1 PSI
LAKE FRONT ACREAGE PROPERTY
ON COMOX LAKE

Property and
Surrounding Land Use Plan

PROJECTION
UTM Zone 10

DATUM
NAD83

CLIENT
Comox Valley
Regional District

Scale: 1:12,000
200 100 0 200
Metres

FILE NO.
VENV03202-01_Figure02_LUP.mxd

PROJECT NO.
ENV.VENV03202-01

DWN
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APVD
DT

REV
0

OFFICE
Tt EBA-VANC

DATE
August 17, 2016

Tt TETRA TECH EBA

Figure 2



LEGEND

- Property Location (approximate)
- Comox Land Corporation - Land for Sale
- Comox Land Corporation - Land to Keep
- Local Road

NOTES
All boundaries are approximate.
Base data source:
Imagery from Google; DigitalGlobe (2015).

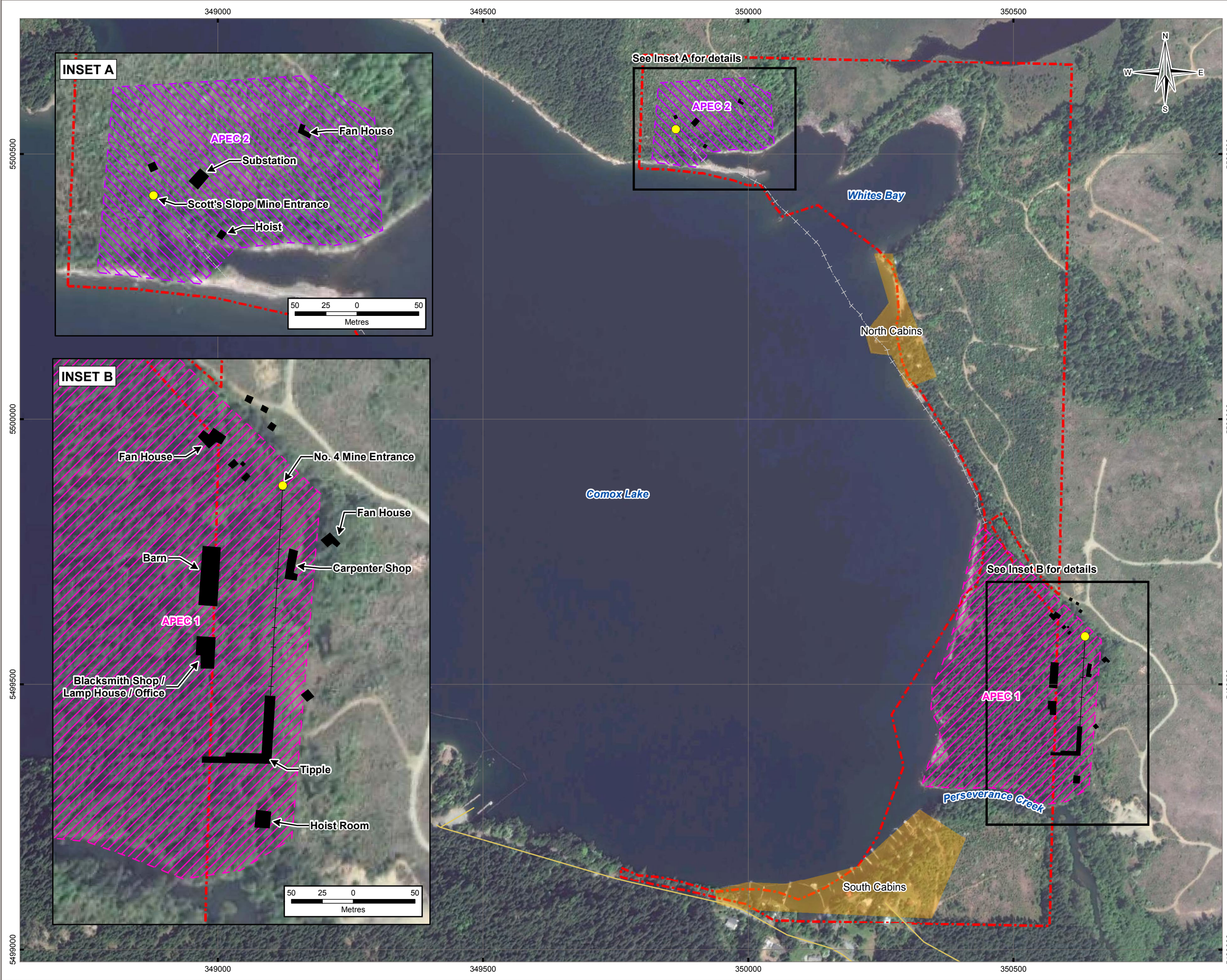
STAGE 1 PSI
LAKE FRONT ACREAGE PROPERTY
ON COMOX LAKE

Comox Land Corporation Land

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT Comox Valley Regional District	
Scale: 1:6,000 100 50 0 100  Metres				 TETRA TECH EBA	
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PROJECT NO. ENV.VENV03202-01	DWN SL	CKD MEZ	APVD DT	REV 0	 TETRA TECH EBA Figure 3
OFFICE Tl EBA-VANC	DATE August 17, 2016				

STATUS
ISSUED FOR REVIEW

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LEGEND

- Property Location (approximate)
- APEC 1 - Historic No. 4 Mine Mining Activities and Coal Tailings
- APEC 2 - Historic Scott's Slope Mining Activities
- Mine Entrance
- Approximate Historic Trestle Bridge from Scott's Slope to No. 4 Mine
- Historic Track to Tipple and Mine Entrance
- Historical Building
- Cabins, Cottages, and Homes
- Local Road

NOTES
All locations and boundaries are approximate.
Base data source:
Imagery from Google; DigitalGlobe (2015).

STATUS
ISSUED FOR REVIEW

STAGE 1 PSI
LAKE FRONT ACREAGE PROPERTY
ON COMOX LAKE

Property Plan and Areas of Potential
Environmental Concern (APEC)

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT Comox Valley Regional District	
Scale: 1:7,000 100500100  Metres				 TETRA TECH EBA	
FILE NO. VENV03202-01_Figure04_APECs.mxd					
PROJECT NO. ENV.VENV03202-01	DWN SL	CKD MEZ	APVD DT	REV 0	Figure 4
OFFICE Tt EBA-VANC	DATE August 17, 2016				

PHOTOGRAPHS

- Photo 1 Cabins, cottages and homes on south portion of the Property.
- Photo 2 Cabins, cottages and homes on south portion of the Property.
- Photo 3 Example of a septic holding tank for three cabins on south portion of the Property.
- Photo 4 Example of a septic distribution field on south portion of the Property.
- Photo 5 Cabins, cottages and homes on south portion of the Property.
- Photo 6 Inland cabin (unoccupied) on south portion of the Property.
- Photo 7 Waste collection dumpster on south portion of the Property.
- Photo 8 Typical access road on the Property.
- Photo 9 Cabins, cottages and homes on north portion of the Property.
- Photo 10 Cabins, cottages and homes on north portion of the Property.
- Photo 11 Heating oil style tank used for potable water for a cabin on the north portion of the Property.
- Photo 12 Twin propane tanks at a cabin on the north portion of the Property.
- Photo 13 Potable water tank for a cabin on the north portion of the Property.
- Photo 14 Historic entrance to Scott's Slope.
- Photo 15 Historic substation building at Scott's Slope.
- Photo 16 Example of surficial soils found at the Scott's Slope entrance.
- Photo 17 Historic trestle bridge from Scott's Slope location, pilings below lake surface.
- Photo 18 Second growth forest on the northern portion of the Property.
- Photo 19 Typical illegal campsite near Scott's Slope.
- Photo 20 View of coal mining tailings rows at No. 4 Mine from Comox Lake.
- Photo 21 Typical coal mining tailings at No. 4 Mine pithead. The area is used as a course by trespassing BMX bikes.
- Photo 22 View of abandoned vehicle at No. 4 Mine pithead.
- Photo 23 Typical coal mining tailings at No. 4 Mine pithead with mature second growth trees.
- Photo 24 View of historic fan house at No. 4 mine pithead.
- Photo 25 View of No. 4 mine historic air shaft (collapsed).
- Photo 26 Remnants of historic rail track at No. 4 Mine pithead.

- Photo 27 Black beach at No. 4 Mine pithead, potentially coal mine tailings.
- Photo 28 Remnants of historic rail track at No. 4 Mine pithead.
- Photo 29 Coal tailings found at No. 4 Mine pithead near the beach.
- Photo 30 Courtney Fish & Game Association facilities viewed from Comox Lake.
- Photo 31 Cumberland Lake Park Campground facilities.



Photo 1: Cabins, cottages and homes on south portion of the Property.



Photo 2: Cabins, cottages and homes on south portion of the Property.

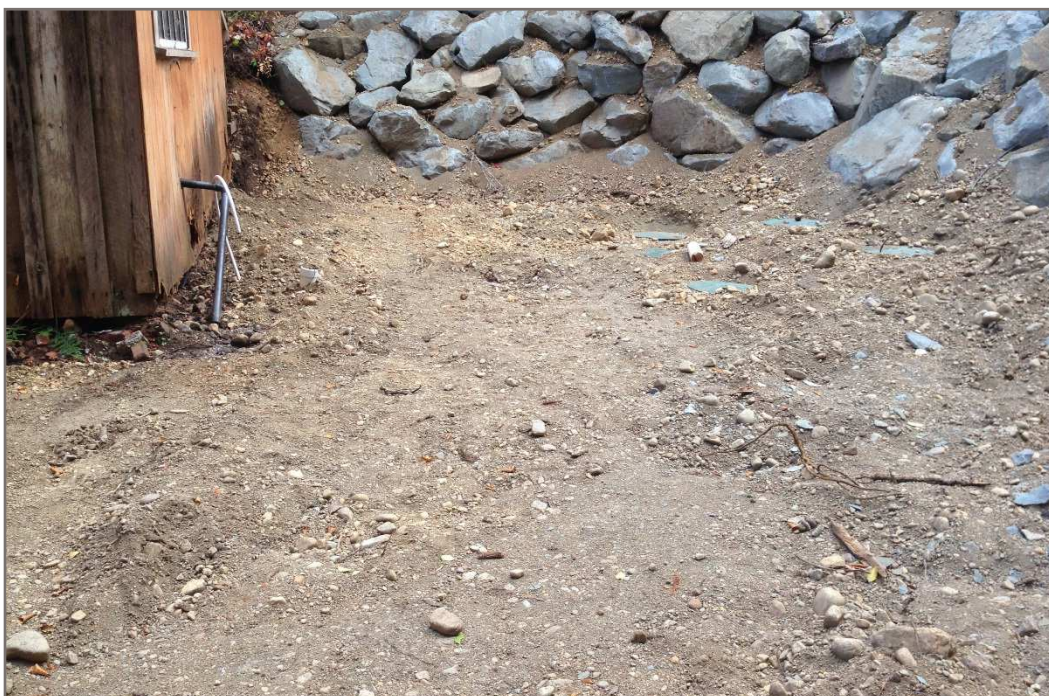


Photo 3: Example of a septic holding tank for three cabins on south portion of the Property.



Photo 4: Example of a septic distribution field on south portion of the Property.



Photo 5: Cabins, cottages and homes on south portion of the Property.



Photo 6: Inland cabin (unoccupied) on south portion of the Property.



Photo 7: Waste collection dumpster on south portion of the Property.

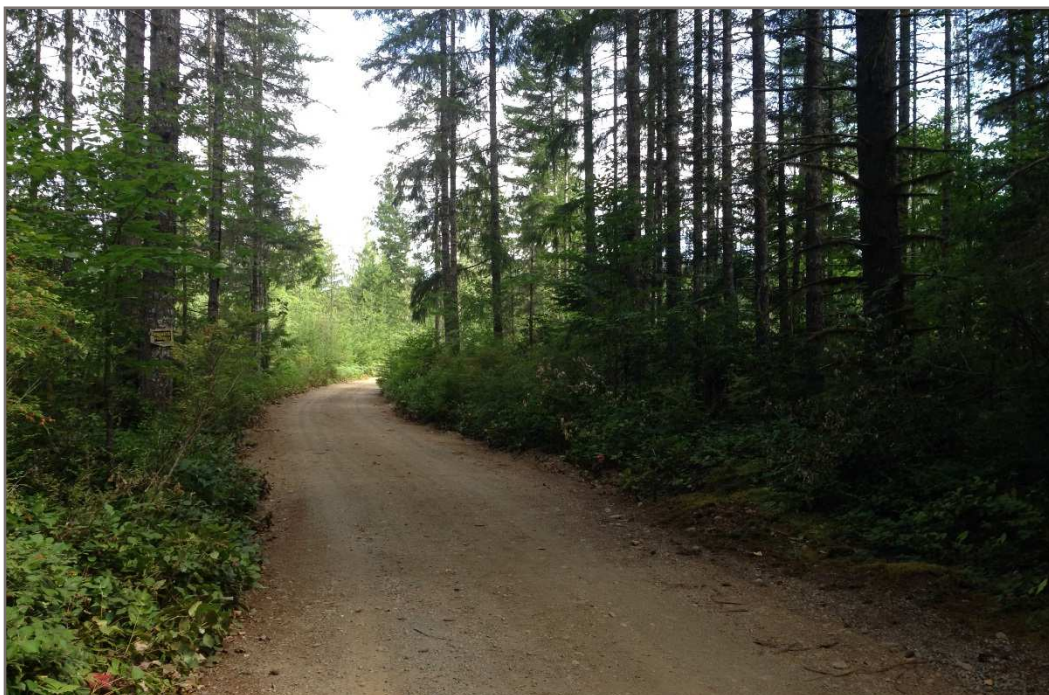


Photo 8: Typical access road on the Property.



Photo 9: Cabins, cottages and homes on north portion of the Property.



Photo 10: Cabins, cottages and homes on north portion of the Property.



Photo 11: Heating oil style tank used for potable water for a cabin on the north portion of the Property.



Photo 12: Twin propane tanks at a cabin on the north portion of the Property.



Photo 13: Potable water tank for a cabin on the north portion of the Property.



Photo 14: Historic entrance to Scott's Slope.



Photo 15: Historic substation building at Scott's Slope.



Photo 16: Example of surficial soils found at the Scott's Slope entrance.



Photo 17: Historic trestle bridge from Scott's Slope location, pilings below lake surface.



Photo 18: Second growth forest on the northern portion of the Property.



Photo 19: Typical illegal campsite near Scott's Slope.



Photo 20: View of coal mining tailings rows at No. 4 Mine from Comox Lake.



Photo 21: Typical coal mining tailings at No. 4 Mine pithead. The area is used as a course by trespassing BMX bikes.



Photo 22: View of abandoned vehicle at No. 4 Mine pithead.



Photo 23: Typical coal mining tailings at No. 4 Mine pithead with mature second growth trees.



Photo 24: View of historic fan house at No. 4 mine pithead.



Photo 25: View of No. 4 mine historic air shaft (collapsed).



Photo 26: Remnants of historic rail track at No. 4 Mine pithead.



Photo 27: Black beach at No. 4 Mine pithead, potentially coal mine tailings.



Photo 28: Remnants of historic rail track at No. 4 Mine pithead.



Photo 29: Coal tailings found at No. 4 Mine pithead near the beach.



Photo 30: Courtney Fish & Game Association facilities viewed from Comox Lake.



Photo 31: Cumberland Lake Park Campground facilities.

APPENDIX A

TETRA TECH EBA'S GENERAL CONDITIONS

GENERAL CONDITIONS

ENVIRONMENTAL PHASE I REPORT

This report incorporates and is subject to these “General Conditions”.

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites.

This report and the assessments and recommendations contained in it are intended for the sole use of Tetra Tech EBA's Client unless otherwise authorized in writing by Tetra Tech EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of Tetra Tech EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 ALTERNATE REPORT FORMAT

Where Tetra Tech EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed Tetra Tech EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by Tetra Tech EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of Tetra Tech EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Tetra Tech EBA. Tetra Tech EBA's instruments of professional service will be used only and exactly as submitted by Tetra Tech EBA.

Electronic files submitted by Tetra Tech EBA have been prepared and submitted using specific software and hardware systems. Tetra Tech EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

3.0 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the Client agrees that notification to such bodies or persons as required may be done by Tetra Tech EBA in its reasonably exercised discretion.

4.0 INFORMATION PROVIDED TO TETRA TECH EBA BY OTHERS

During the performance of the work and the preparation of the report, Tetra Tech EBA may rely on information provided by persons other than the Client. While Tetra Tech EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, Tetra Tech EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

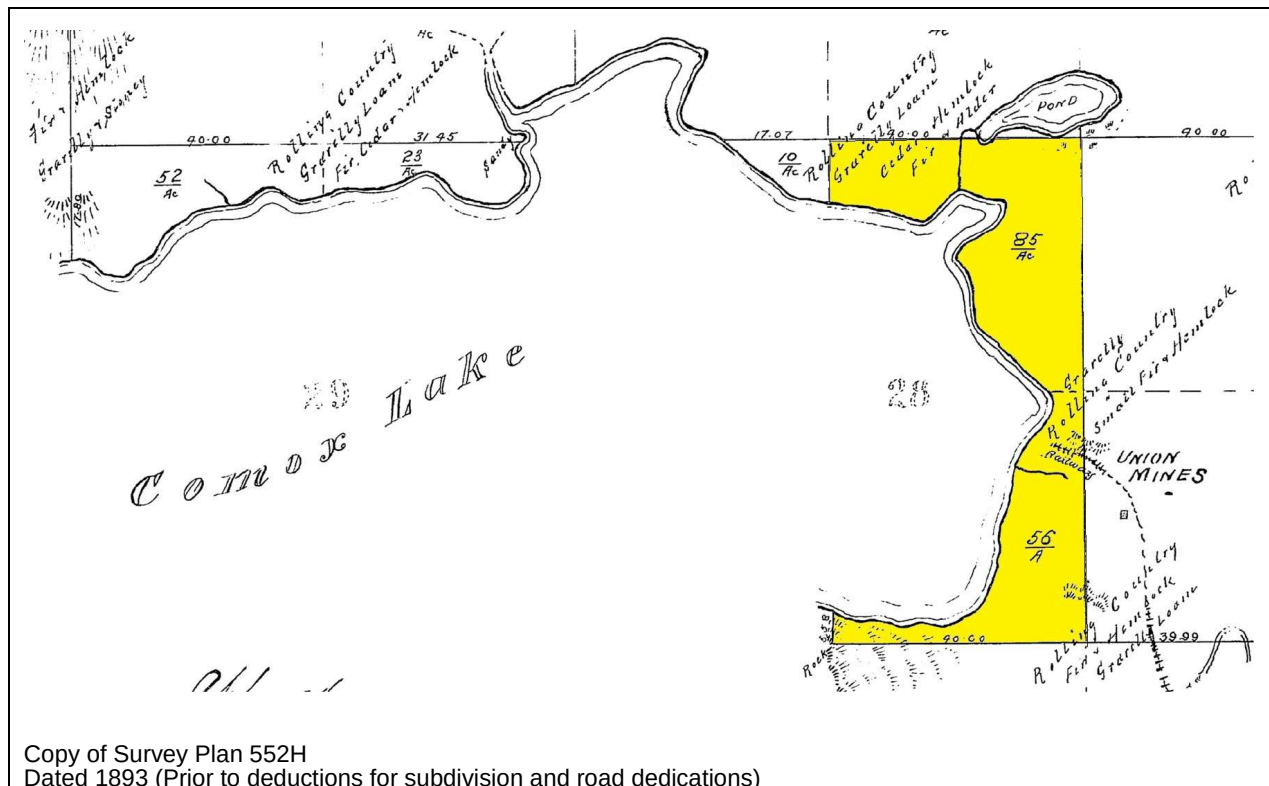
APPENDIX B

LEGAL LOT PLAN AND LAND TITLE

PHOTOGRAPHS OF THE PROPERTY



2014 Aerial Photograph of the Property
 Source: Comox Valley Regional District IMAP System
 Note: Property also includes portions of the lakebed



Copy of Survey Plan 552H
 Dated 1893 (Prior to deductions for subdivision and road dedications)

COPY OF TITLE SEARCH PRINT

TITLE SEARCH PRINT

2016-03-13, 10:40:29

File Reference:

Requestor: Dan Wilson

Declared Value \$1237000

****CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN****

Land Title District

VICTORIA

Land Title Office

VICTORIA

Title Number

ES91925

From Title Number

ES6756

Application Received

2001-10-19

Application Entered

2001-10-22

Registered Owner in Fee Simple

Registered Owner/Mailing Address:

COMOX LAKE LAND CORPORATION, INC.NO. 627536
949 FITZGERALD AVENUE
COURTENAY, BC
V9N 2R6

Taxation Authority

COURTENAY ASSESSMENT AREA

Description of Land

Parcel Identifier:

006-687-393

Legal Description:

FRACTIONAL SECTION 28, TOWNSHIP 10, COMOX DISTRICT, PLAN 552H TOGETHER
WITH THAT PORTION OF THE BED OF COMOX LAKE INCLUDED WITHIN THE AREA SHOWN
OUTLINED IN RED ON PLAN DEPOSITED UNDER DD 1983 EXCEPT PARTS IN PLANS
21 RW, 788 RW, 26178 AND VIP57417

Legal Notations

THIS TITLE MAY BE AFFECTED BY A PERMIT UNDER PART 26 OF THE LOCAL
GOVERNMENT ACT, SEE FB246472

Charges, Liens and Interests

Nature:

UNDERSURFACE RIGHTS

Registration Number:

ES91926

Registration Date and Time:

2001-10-19 14:41

Registered Owner:

WEST FRASER MILLS LTD/
INCORPORATION NO. BC0712789

Transfer Number:

FA62001

Remarks:

ALL EXCEPT NATURAL GAS ASSIGNED TO FB228649
NATURAL GAS ONLY ASSIGNED TO FB228650

Title Number: ES91925

TITLE SEARCH PRINT

Page 1 of 3

TITLE SEARCH PRINT

2016-03-13, 10:40:29

File Reference:

Requestor: Dan Wilson

Declared Value \$1237000

Nature: STATUTORY RIGHT OF WAY
Registration Number: ES91927
Registration Date and Time: 2001-10-19 14:41
Registered Owner: COMPLIANCE HOLDINGS LTD.
INCORPORATION NO. BC0974499
Transfer Number: CA4085017

Nature: STATUTORY RIGHT OF WAY
Registration Number: ES91928
Registration Date and Time: 2001-10-19 14:41
Registered Owner: COMPLIANCE HOLDINGS LTD.
INCORPORATION NO. BC0974499
Transfer Number: CA4085018

Nature: RESTRICTIVE COVENANT
Registration Number: ES91929
Registration Date and Time: 2001-10-19 14:42
Remarks: PART SHOWN ON PLAN VIP72864. APPURTENANT TO THAT
PART OF SECTION 28, TOWNSHIP 19, COMOX DISTRICT
PLAN 552H INCLUDED IN PLAN 21RW

Nature: GRANT OF TIMBER
Registration Number: ES91930
Registration Date and Time: 2001-10-19 14:42
Registered Owner: 597070 B.C. LTD.
INCORPORATION NO. 597070

Nature: UNDERSURFACE RIGHTS
Registration Number: FB228649
Registration Date and Time: 2008-11-10 14:33
Registered Owner: COMPLIANCE COAL CORPORATION
INCORPORATION NO. A56209
AS TO AN UNDIVIDED 6/10 INTEREST
I-COMOX COAL INC.
INCORPORATION NO. 0831904
AS TO AN UNDIVIDED 2/10 INTEREST
LG INTERNATIONAL INVESTMENTS (CANADA) LTD.
INCORPORATION NO. 0830446
AS TO AN UNDIVIDED 2/10 INTEREST
Remarks: ASSIGNMENT OF ES91926 (SEE FA62001)
AS TO ALL EXCEPT NATURAL GAS
ASSIGNMENT OF ES91926 (SEE FA62001)
AS TO ALL EXCEPT NATURAL GAS
ASSIGNED TO CA4084974

Title Number: ES91925

TITLE SEARCH PRINT

Page 2 of 3

TITLE SEARCH PRINT

2016-03-13, 10:40:29

File Reference:

Requestor: Dan Wilson

Declared Value \$1237000

Nature: UNDERSURFACE RIGHTS
Registration Number: FB228650
Registration Date and Time: 2008-11-10 14:33
Registered Owner: COMPLIANCE COAL CORPORATION
INCORPORATION NO. A56209
Remarks: ASSIGNMENT OF ES91926 (SEE FA62001)
AS TO NATURAL GAS ONLY
FORFEITED TO CROWN, SEE FB489614

Nature: UNDERSURFACE RIGHTS
Registration Number: CA4084974
Registration Date and Time: 2014-11-18 11:06
Registered Owner: COMPLIANCE HOLDINGS LTD.
INCORPORATION NO. BC0974499
Remarks: ASSIGNMENT OF FB228649 (SEE ES91926 FA62001)
AS TO ALL EXCEPT NATURAL GAS

Nature: UNDERSURFACE RIGHTS
Registration Number: FB489614
Registration Date and Time: 2015-04-22 09:05
Registered Owner: THE CROWN IN RIGHT OF BRITISH COLUMBIA
Remarks: TRANSFER OF FB228650

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers NONE

Pending Applications NONE

Title Number: ES91925

TITLE SEARCH PRINT

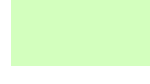
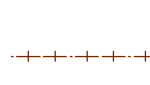
Page 3 of 3

APPENDIX C

VILLAGE OF CUMBERLAND ZONING MAP

MAP A FUTURE LAND USE

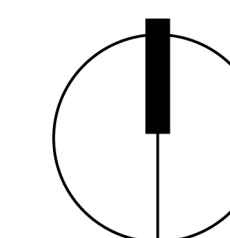
LEGEND

-  Agricultural
-  Commercial
-  Commercial Mixed Use
-  Greenway
-  Industrial*
-  Institutional
-  Mixed Land Use
-  Park
-  Recreation
-  Residential Infill
-  Residential
-  Working Forest
-  Heritage Conservation Area - HCA-1 **
-  Village Municipal Boundary
-  Historic Railway
-  River or Stream
-  Water Body

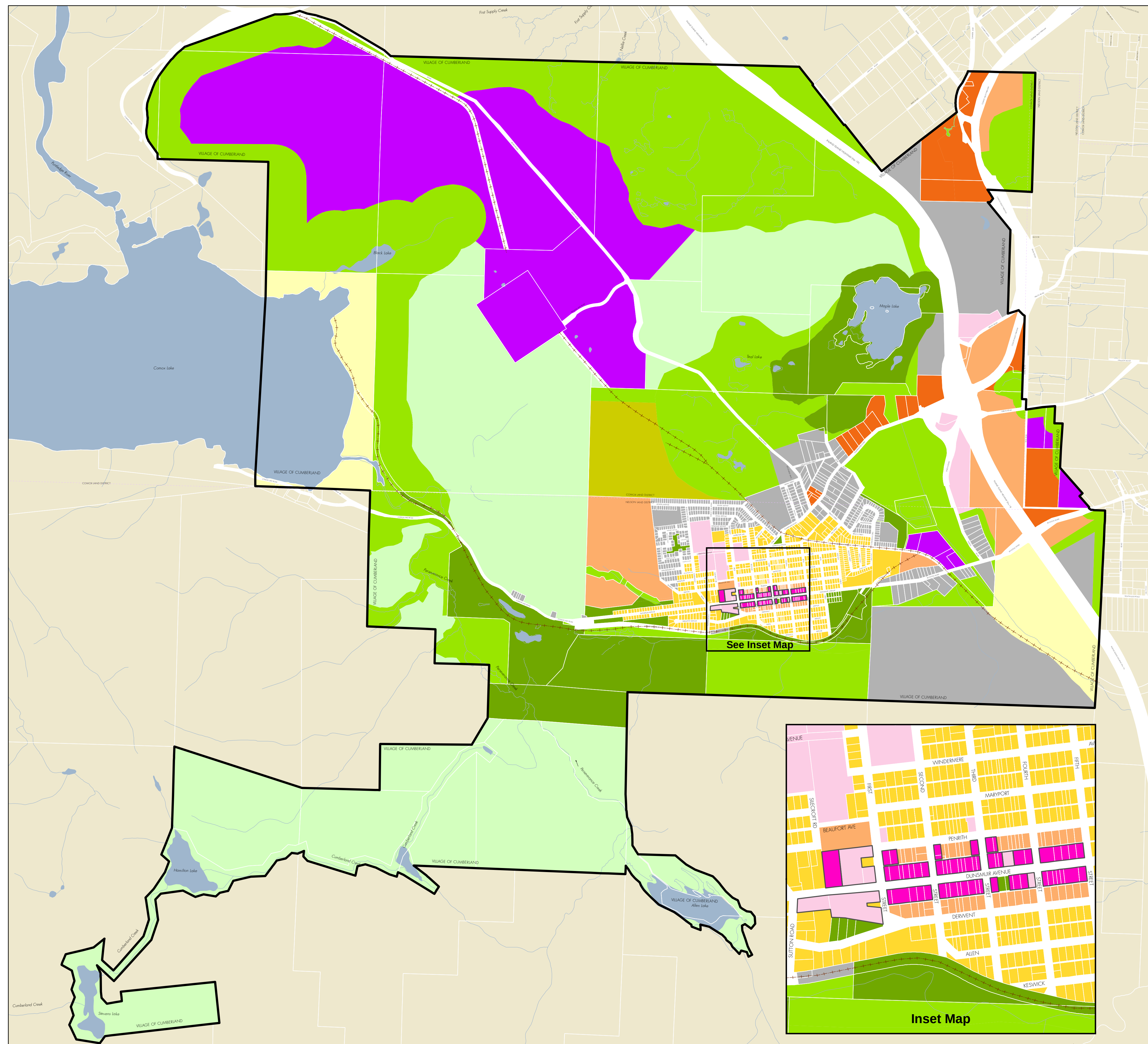
Notes:

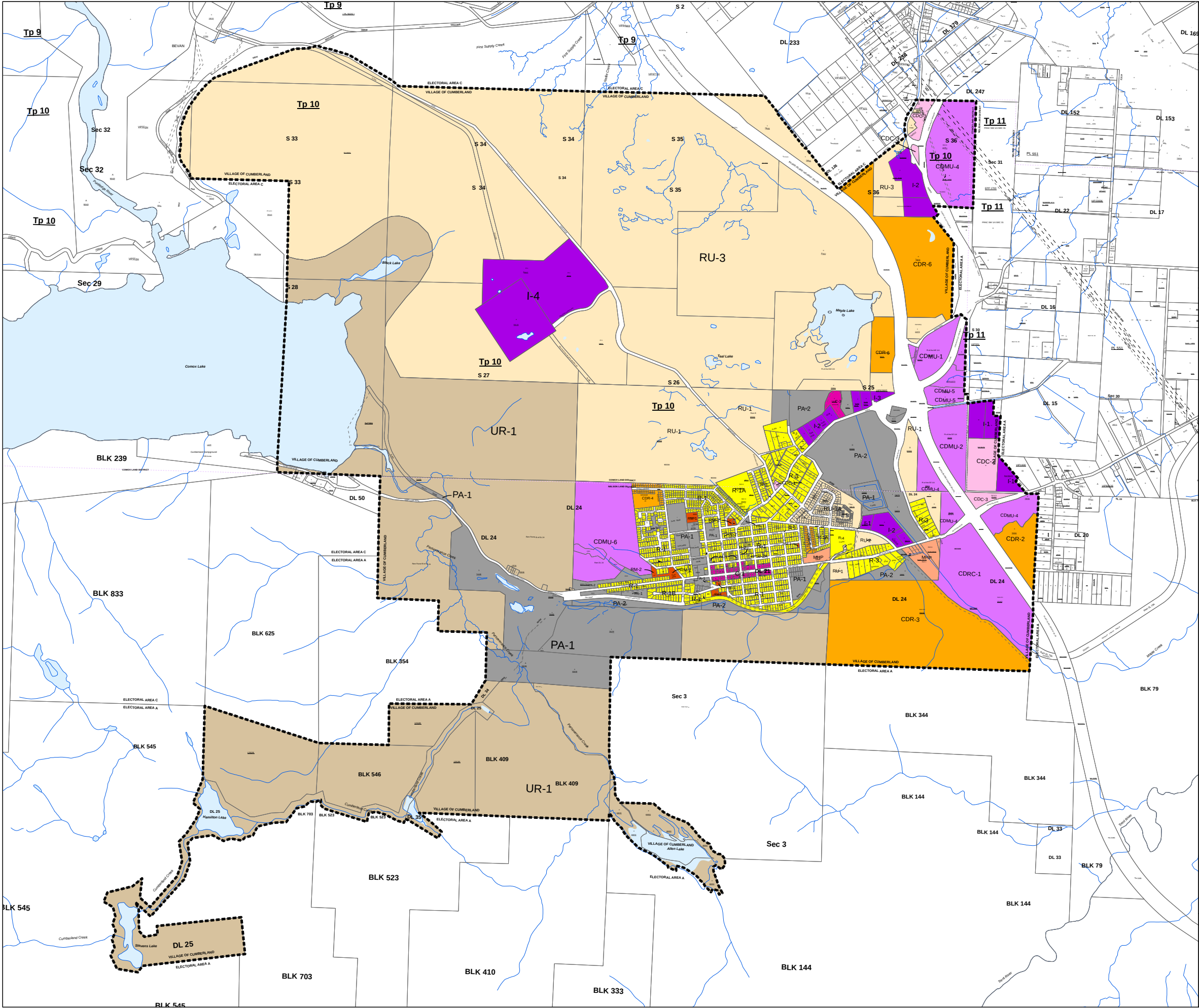
* As development occurs in an industrial zone, consideration needs to be given to groundwater protection.

** Please refer to Map D Heritage Conservation Area - Historic Village Commercial Core - HCA-1.



0 250 500 1,000 1,500 2,000 m





SCHEDULE 'B-1' AND 'B-2' ZONING DESIGNATIONS

Village of Cumberland Zoning Bylaw No. 717, 1997

LEGEND:

Residential:

- RM-1 - Residential Multiple One
- RM-2 - Residential Multiple Two
- MHP - Mobile Home Park
- R-1 - Residential One
- R-1A - Residential One A
- R-1B - Residential One B
- R-2 - Residential Two
- R-2A - Residential Two A
- R-3 - Residential Three
- R-4 - Residential Four

Rural:

- RU-1 - Rural One
- RU-1A - Rural One A
- RU-2 - Rural Two
- RU-3 - Rural Three
- UR-1 - Upland Rural One

Commercial/Industrial:

- C-1 - Commercial One
- C-2 - Commercial Two
- C-3 - Commercial Three
- I-1 - Industrial One
- I-2 - Industrial Two
- I-3 - Industrial Three
- I-4 - Industrial Four

Public Use & Assembly:

- PA-1 - Public Assembly One
- PA-2 - Public Assembly Two

Comprehensive Development

- CDR-1 - Comprehensive Development Residential One
- CDR-2 - Comprehensive Development Residential Two
- CDR-3 - Comprehensive Development Residential Three
- CDR-4 - Comprehensive Development Residential Four
- CDR-6 - Comprehensive Development Residential Six
- CDC-1 - Comprehensive Development Commercial One
- CDC-2 - Comprehensive Development Commercial Two
- CDC-3 - Comprehensive Development Commercial Three
- CDMU-1 - Comprehensive Development Mixed Use One
- CDMU-2 - Comprehensive Development Mixed Use Two
- CDMU-4 - Comprehensive Development Mixed Use Four
- CDMU-5 - Comprehensive Development Mixed Use Five
- CDMU-6 - Comprehensive Development Mixed Use Six
- CDRC-1 - Comprehensive Development Recreation/Commercial

No Data:

- No Data (lakes/watercourses)
- No Data (rrw, unzoned)

Last Zoning Amendment - July 22, 2013
Revision to Cadastral Base: January 15, 2013

0 500 1,000 1,500 2,000 Metres



Village of Cumberland

APPENDIX D

NATURAL SETTINGS

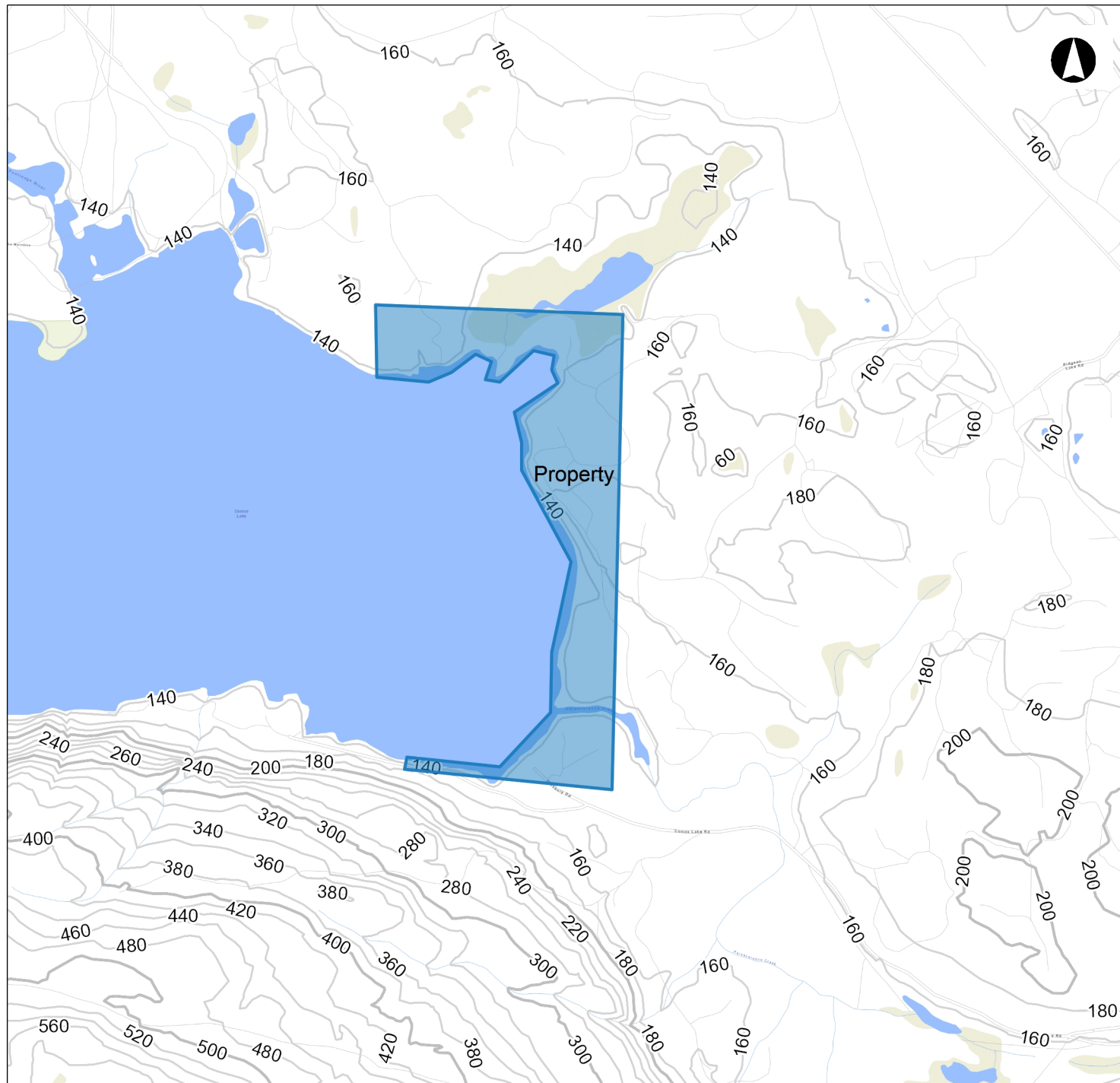
Elevation Contours

Surrounding Surficial Water Bodies

Historical Climate Information

Water Wells 500 m Radius

Floodplain Map



Elevation Contours

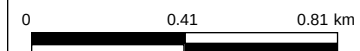
Legend

Contours (1:20,000)

FCODE

- Contour - Index
- Contour - Index Indefinite
- Contour - Index Depression
- Contour - Index Depression Inde
- Contour - Intermediate
- Contour - Intermediate Indefinite
- Contour - Intermediate Depressi
- Contour - Intermediate Depressi

TileCache



1: 20,000

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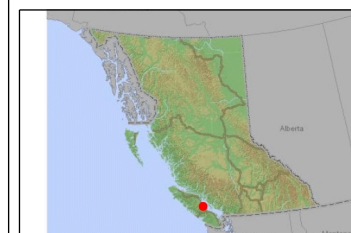
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Datum: NAD83

Projection: NAD_1983_BC_Environment_Albers

Key Map of British Columbia





Government
of Canada

Gouvernement
du Canada

[Home](#) → [Environment and natural resources](#) → [Weather, Climate and Hazard](#) → [Past weather and climate](#)
→ [Climate Normals & Averages](#)

Canadian Climate Normals 1981-2010 Station Data

▼ Temperature and Precipitation Graph

Javascript must be enabled for this page to work

▼ Normals Data

The minimum number of years used to calculate these Normals is indicated by a code for each element. A "+" beside an extreme date indicates that this date is the first occurrence of the extreme value. Values and dates in bold indicate all-time extremes for the location.

Data used in the calculation of these Normals may be subject to further quality assurance checks. This may result in minor changes to some values presented here.

COURTENAY MEADOWBROOK **BRITISH COLUMBIA**

Latitude: 49°43'01.050" N

Longitude: 124°58'37.001" W

Elevation: 35.00 m

Climate ID: 102JR88

WMO ID:

TC ID:

▼ Temperature

<u>Temperature</u>														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
Daily Average (°C)	3.0	3.6	5.7	9.1	12.5	15.5	17.9	17.6	14.2	9.0	5.1	3.1	9.7	<u>D</u>

<u>Temperature</u>														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
Standard Deviation	1.5	1.5	1.3	1.0	1.4	1.2	1.0	1.0	0.9	0.9	1.1	1.6	2.1	<u>D</u>
Daily Maximum (°C)	5.6	7.1	10.0	14.3	18.1	21.0	23.8	23.7	20.1	13.0	8.0	5.4	14.2	<u>D</u>
Daily Minimum (°C)	0.3	0.0	1.3	3.9	6.8	9.9	11.9	11.5	8.2	5.0	2.1	0.7	5.1	<u>D</u>
Extreme Maximum (°C)	13.0	15.0	19.5	28.0	31.0	33.5	35.0	34.0	31.0	24.0	18.0	16.5		
Date (yyyy/dd)	1989/30	1991/27	1994/28	1998/30	2005/28	1995/29	2006/21	2002/13	1988/03	1992/01	2006/06	2005/24		
Extreme Minimum (°C)	-14.5	-14.5	-8.5	-3.0	-1.5	2.0	5.5	4.5	0.0	-6.0	-10.5	-13.0		
Date (yyyy/dd)	1996/30	1989/03	1989/03	1999/01	2002/07	1988/04	1996/05	1992/23	1992/27	1991/29	2006/28	1996/27		

▼ Precipitation

<u>Precipitation</u>													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Rainfall (mm)	216.0	134.8	127.0	90.7	53.0	53.0	29.9	35.4	45.7	146.9	232.3	236.4	1400.9
Snowfall (cm)	15.9	9.3	11.3	0.1	0.0	0.0	0.0	0.0	0.0	0.2	6.0	12.1	54.9
Precipitation (mm)	231.8	144.1	138.3	90.7	53.0	53.0	29.9	35.4	45.7	147.1	238.3	248.5	1455.8
Average Snow Depth (cm)	2	1	1	0	0	0	0	0	0	0	0	1	1
Median Snow Depth (cm)	1	0	0	0	0	0	0	0	0	0	0	0	0
Snow Depth at Month-end (cm)	2	0	0	0	0	0	0	0	0	0	1	6	1

<u>Precipitation</u>													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Extreme Daily Rainfall (mm)	76.8	62.8	107.2	67.2	34.6	30.2	22.4	40.2	50.2	80.2	82.0	67.0	
Date (yyyy/dd)	2003/01	2006/03	1997/17	2003/07	1987/29	1990/02	1994/01	1991/29	1997/16	1997/09	1998/23	1993/09	
Extreme Daily Snowfall (cm)	37.0	20.0	53.4	1.0	0.0	0.0	0.0	0.0	0.0	4.0	28.0	41.0	
Date (yyyy/dd)	2004/06	1989/17	1996/03	1999/08	1987/01	1987/01	1987/01	1987/01	1987/01	1991/28	2006/25	2000/15	
Extreme Daily Precipitation (mm)	76.8	62.8	107.2	67.2	34.6	30.2	22.4	40.2	50.2	80.2	82.0	67.0	
Date (yyyy/dd)	2003/01	2006/03	1997/17	2003/07	1987/29	1990/02	1994/01	1991/29	1997/16	1997/09	1998/23	1993/09	
Extreme Snow Depth (cm)	37	32	46	0	0	0	0	0	0	0	27	59	
Date (yyyy/dd)	1997/01	1989/18	1996/04	1988/01	1987/13	1987/01	1987/01	1987/01	1987/01	1987/01	2006/26	1996/31	



► Days with Maximum Temperature

► Days with Minimum Temperature

► Days with Rainfall

► Days With Snowfall

► Days with Precipitation

► Degree Days

Legend

- A = WMO "3 and 5 rule" (i.e. no more than 3 consecutive and no more than 5 total missing for **either** temperature **or** precipitation)
- B = At least 25 years
- C = At least 20 years
- D = At least 15 years

▼ Station / Element Metadata

Statistics listed below are provided as a guide to determine the validity of Normals and Extremes calculations. For example, a station with 30 years of record between 1981 and 2010 with no missing years would be a more reliable normal than a station with 15 years of record and 2 missing years. Less than 100% possible observations indicates that out of the total number of observations used, some records were missing.

COURTENAY MEADOWBROOK

Province	BC
<u>Latitude (dd mm):</u>	49 43 N
Country	CAN
<u>Longitude (ddd mm):</u>	124 58 W
Time Zone	PST
<u>Latitude (decimal degrees):</u>	49.72 N
<u>Climate ID:</u>	102JR88
<u>Longitude (decimal degrees):</u>	124.98 W
<u>WMO ID:</u>	
<u>Elevation (m):</u>	35
<u>TC ID:</u>	

▼ Temperature

<u>Temperature</u>						
	Begin Year	End Year	Total Number of Years	Missing Years	Total Count of Observations	% of Possible Observations
Daily Average (°C)	1987	2007	20	1	6704	95
Standard Deviation	1987	2007	20	1	6704	95
Daily Maximum (°C)	1987	2007	20	1	6708	95.1
Daily Minimum (°C)	1987	2007	20	1	6718	95.2
Extreme Maximum (°C)	1987	2007			6934	98.2
Extreme Minimum (°C)	1987	2007			6968	98.7

▼ Precipitation

<u>Precipitation</u>						
	Begin Year	End Year	Total Number of Years	Missing Years	Total Count of Observations	% of Possible Observations
Rainfall (mm)	1987	2007	20	1	7028	97.1
Snowfall (cm)	1987	2007	20	1	7028	97.1
Precipitation (mm)	1987	2007	20	1	7028	97.1
Average Snow Depth (cm)	1987	2007	20	1	6983	96.4
Median Snow Depth (cm)	1987	2007	20	1	6983	96.4
Snow Depth at Month-end (cm)	1987	2007	20	1	235	98.8
Extreme Daily Rainfall (mm)	1987	2007			7190	99.3
Extreme Daily Snowfall (cm)	1987	2007			7222	99.7
Extreme Daily Precipitation (mm)	1987	2007			7185	99.2
Extreme Snow Depth (cm)	1987	2007			7131	98.4

► Days with Maximum Temperature

► Days with Minimum Temperature

► Days with Rainfall

► Days With Snowfall

► Days with Precipitation

► Degree Days

► Frost-Free

▼ Calculation Information

- [Calculation Method](#)
- [Normals Code](#)
- [Uncertainty due to shorter period](#)
- [Standard Deviation Calculations](#)
- [Climate Extremes](#)
- [Support Information](#)
- [Data and Observing Stations](#)
- [APPENDIX A](#)

"Climate averages", "climate means" or "climate normals" are all interchangeable terms. They refer to arithmetic calculations based on observed climate values for a given location over a specified time period. Climate normals are often used to classify a region's climate and make decisions for a wide variety of purposes involving basic habitability, agriculture and natural vegetation, energy use, transportation, tourism, and research in many environmental fields. Normals are also used as a reference for seasonal monitoring of climate temperature and precipitation for basic public interest, and for monitoring drought or forest fires risk. Real-time values, such as daily temperature, are often compared to a location's "climate normal" to determine how unusual or how great the departure from "average" they are.

The World Meteorological Organization (WMO) recommends that countries prepare climate normals for the official 30-year normals periods ending in 1930, 1960 and 1990, for which the WMO World Climate Normals are published. In addition, WMO recommends the updating of climate normals at the end of every decade as provided here for 1981 to 2010.

► **Calculation Method**

► **Normals Code**

► **Uncertainty due to shorter period**

► **Standard Deviation Calculations**

► **Climate Extremes**

► **Support Information**

► **Data Adjustments**

► **Data and Observing Stations**

► **Temperature**

► **Rainfall, Snowfall, and Precipitation**

► **Snow Depth**

► **Number of Days With Specified Parameters**

► **Degree-Days**

► **Soil Temperature**

► **Evaporation**

► **Frost and Freezing-Free Period**

► **Hourly Data**

► **Wind**

► **Bright Sunshine**

► **Humidex**

► **Wind Chill**

► **Humidity**

► **Pressure**

► **Solar Radiation**

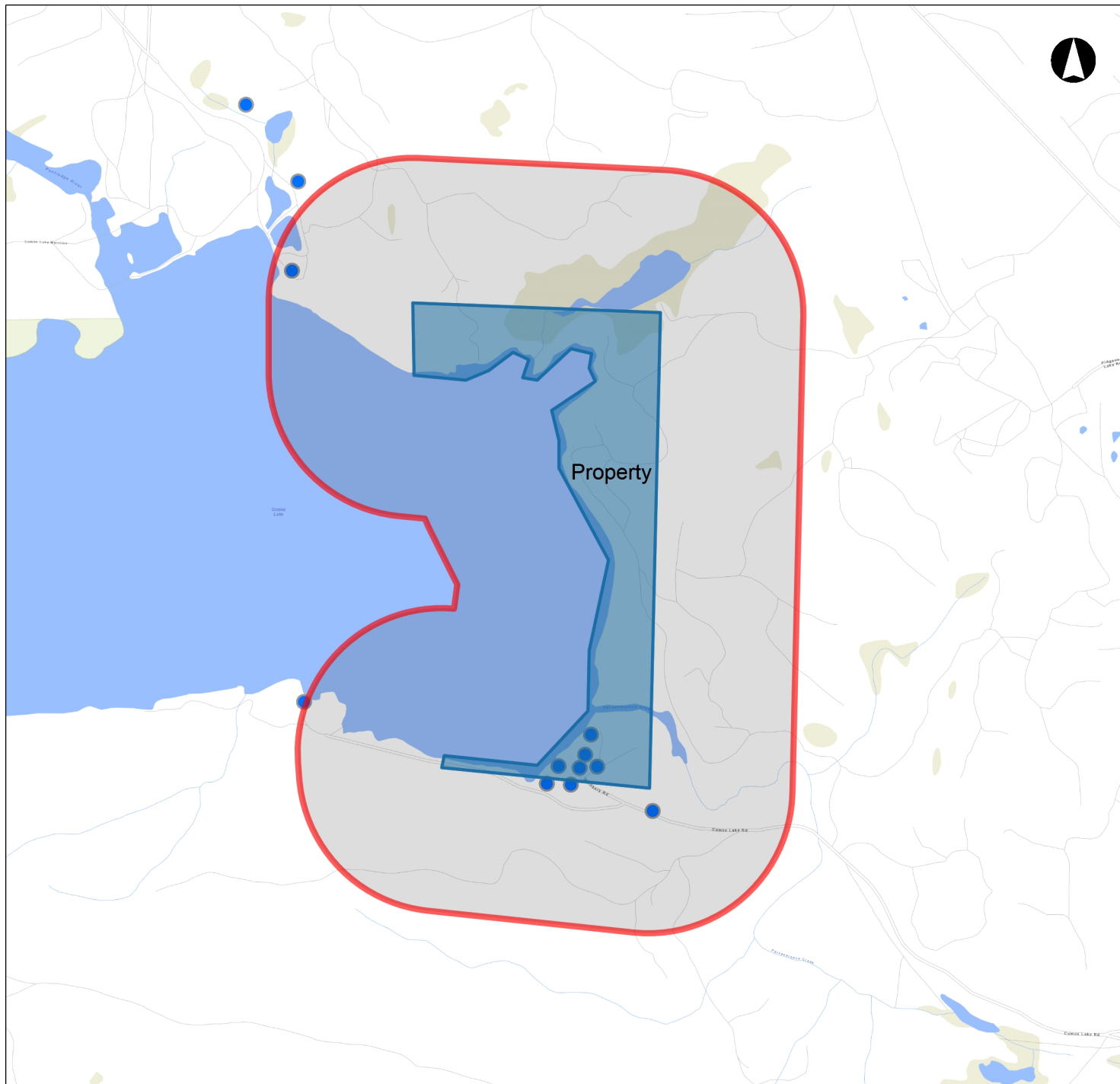
► **Visibility (km)**

► **Cloud Amount**

► **APPENDIX A**

Date modified:

2016-06-22



Water Well Search

Legend

- Water Wells
- TileCache

0 0.41 0.81 km

1: 20,000

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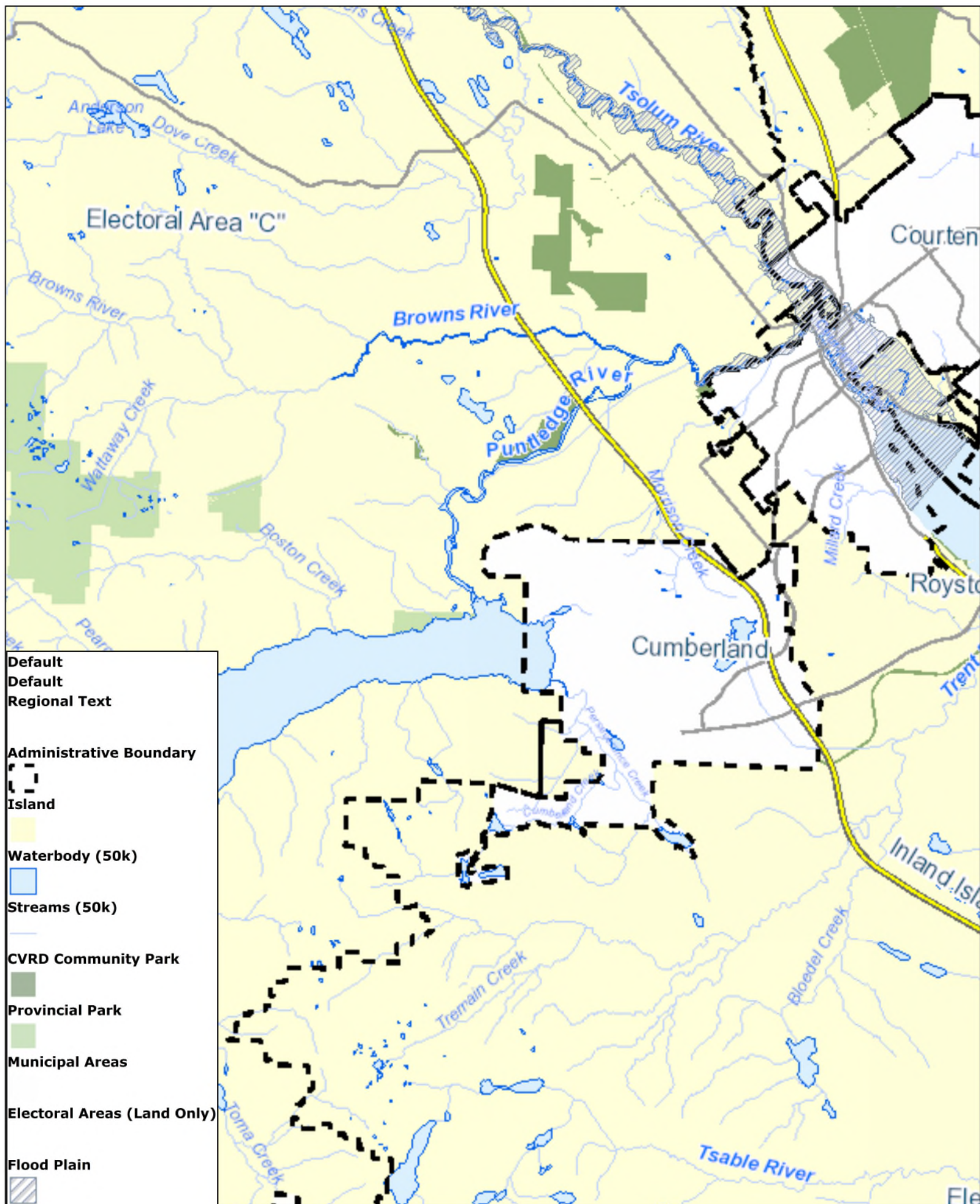
Datum: NAD83

Projection: NAD_1983_BC_Environment_Albers

Key Map of British Columbia



Comox Valley Floodplain Map



APPENDIX E

BC ONLINE SITE REGISTRY

As Of: AUG 14, 2016 BC Online: Site Registry 16/08/16
 For: PK71787 EBA ENGINEERING CONSULTANTS LTD. 11:01:56
 Folio: ENV.VENV03202 Page 1

19 records selected for 5.0 km from latitude 49 deg, 37 min, 55.5 sec
 and Longitude 125 deg, 4 min, 13.8 sec

Site Id	Lastupd	Address / City
0001788	06JAN17	DUNSMUIR ROAD CUMBERLAND
0003194	04APR06	2743 DUNSMUIR AVENUE CUMBERLAND
0003692	09JAN26	2766 DUNSMUIR CUMBERLAND
0004623	12NOV26	BEVAN ROAD CUMBERLAND
0004668	00OCT20	2400 PIDGEON LAKE ROAD (BEVAN ROAD) CUMBERLAND
0004998	11NOV24	2425 COMOX LAKE ROAD CUMBERLAND
0005004	00MAR17	4135 CUMBERLAND ROAD COURTENAY
0006441	02JUN26	1351 MCPHEE AVENUE COURTENAY
0007146	03MAR10	2203, 2211, 2370, AND 2425 COMOX LAKE ROAD CUMBERLAND
0009773	13NOV14	2956 ULVERSTON AVENUE CUMBERLAND
0010037		3346 CRESENT STREET CUMBERLAND
0010057		7 - 17 MAPLE STREET CUMBERLAND
0012111		COAL VALLEY ESTATES CUMBERLAND
0013392	14DEC10	3780 COLAKE RD, PO BOX 3177 COURTENAY
0014561	13NOV14	PIDGEON LAKE ROAD CUMBERLAND
0017239	14NOV21	2665, 2678, 2675 AND 2679 DUNSMUIR AVENUE CUMBERLAND
0017390	14NOV25	3249 FIRST STREET CUMBERLAND
0017841		3699 BEVAN ROAD CUMBERLAND
0018992		4616 CUMBERLAND ROAD CUMBERLAND

APPENDIX F

HAZARDOUS MATERIALS

Polychlorinated Biphenyls

The past use of polychlorinated biphenyls (PCBs) in electrical equipment; such as transformers, fluorescent lamp ballasts, and capacitors, was common prior to 1980. The federal Environmental Contaminants Act, 1976, prohibited the use of PCBs in heat transfer and electrical equipment installed after September 1, 1977, and in transformers and capacitors installed after July 1, 1980.

Asbestos-Containing Materials

Asbestos-containing materials (ACMs) were commercially used in North America since the late 1800's. Canadian regulations limiting the use of ACMs were enacted between 1978 and 1980. ACM may become a health concern if the material deteriorates or is disturbed and the asbestos fibres become airborne and are subsequently inhaled.

Lead-Based Paints

Most paints used for indoor and outdoor purposes were lead-based since before the 1950s. Since the late 1970s, the use of lead in interior paint was limited by law. By the early 1990s, all consumer paints (for interior and exterior purposes) produced in Canada were essentially lead-free

Ozone-Depleting Substances

Chlorofluorocarbons (CFCs) are a common category of ozone-depleting substances (ODS) that were often found in coolants used in refrigerators and air conditioners manufactured prior to the mid-1990s.

Urea Foam Formaldehyde Insulation

Urea form formaldehyde insulation (UFFI) was developed in Europe in the 1950s, and has been installed in Canadian homes until it was banned in 1980

Suspect Visible Fungal Amplification

Fungi are common contaminants in the indoor environment. It is the amplification of fungi and the distribution of fungal spores in high concentrations that may be a concern. Bioaerosols typically cause little, if any, harm but may elicit allergic responses in sensitive individuals, even at ambient concentrations, or in all persons, when such agents are present in sufficient quantity⁴. The most common symptoms of fungal exposure are runny nose, eye irritation, cough, congestion, and aggravation of asthma⁵. Although there is evidence documenting severe health effects of fungi in humans, most of the evidence is derived from ingestion of contaminated foods (e.g., grain and peanut products) or occupational exposures in agricultural settings where inhalation exposures were known to be very high.

The burden of illness in the population attributable to fungi in private homes and public buildings is not yet completely understood. While the magnitude of the population risk is unknown, it would seem prudent, based on current evidence, to remediate all indoor sources conducive to growth.

⁴ Bioaerosols Assessment and Control, American Conference of Governmental Industrial Hygienists (ACGIH), 1999.

⁵ Guidelines on Assessment and Remediation of Fungi in Indoor Environments, New York City Department of Health, 2000.