



## REGIONAL DISTRICT OF CENTRAL KOOTENAY

# DEVELOPMENT PERMIT

4260-20-2016-DP1611A-04155.195-Halberstadt-DP000072  
(DP1611A)

Date: February 15, 2017

Issued pursuant to Section 490 and 491 of the *Local Government Act*

1. This Development Permit is issued to Jean Patrice MacLean and Brian Douglas Halberstadt of Calgary, Alberta as the registered owners (hereinafter called the "Permittees") and shall only apply to those lands within the Regional District of Central Kootenay, in the Province of British Columbia legally described as Lot A District Lot 2155 Kootenay District Plan NEP59049 (PID: 023-849-801) as shown on the attached "Schedule 1 – Location Map", forming part of this Permit, referred to hereafter as the "Said Lands".
2. This Development Permit is issued subject to compliance with all of the Bylaws of the Regional District of Central Kootenay applicable thereto, except as specifically varied or supplemented by this Permit.
3. This Development Permit shall not have the effect of varying the use or density of land as specified in the applicable Zoning Bylaw of the Regional District of Central Kootenay, nor a Floodplain Specification under Section 524 of the *Local Government Act*.
4. The said lands have been designated 'Suburban Residential (RS)' and are located within an Environmentally Sensitive Development Permit (ESDP) Area pursuant to Section 16.0 of the *Electoral Area 'A' Comprehensive Land Use Bylaw No. 2315, 2013*, as amended.
5. The Permittees have applied to the Ministry of Transportation and Infrastructure for the purposes of subdivision approval and to use land and buildings situated on the said lands for this purpose. Pursuant to this Development Permit and subject to the terms and conditions herein contained, as well as all other applicable Regional District Bylaws, the Regional District of Central Kootenay hereby authorizes the use of the said lands for the purposes of subdivision approval.
6. The Permittees have applied to the Regional District of Central Kootenay to develop the property by constructing a 45m<sup>2</sup> (4.5m x 10.0m) boathouse approximately 4 metres from the natural boundary of Kootenay Lake and placing one set of marine rails that are approximately 1.37 metres wide and 32 metres in length from the boathouse structure into Kootenay Lake, and to use land and buildings situated on the said lands for this purpose. Pursuant to this Development Permit and subject to the terms and conditions herein contained, as well as all other applicable Regional District Bylaws, the Regional District of Central Kootenay hereby authorizes the development of the proposed boathouse and marine rails on the said lands, and in particular includes authorisation for those items attached to this Development Permit as "Schedule 2 – Development Plans".

7. The Permittees are required to obtain approval in writing from the Regional District of Central Kootenay prior to the construction any new buildings, external additions to existing buildings or for any deviation from the development authorized under Section 5 and Section 6 of this Development Permit. Furthermore, the Permittees are hereby advised of the following requirements:
  - 7.1 The Regional District of Central Kootenay Building Department requires that the Permittees obtain a demolition permit and/or building permit prior to the removal of any existing buildings and structures, the renovation, expansion or alteration of any existing building and the construction of any new building.
  - 7.2 The Permittees will keep the clearing of native vegetation within the riparian area to the minimum possible required to complete those development activities authorised under Section 6 of this Development Permit; including vegetation clearing for access, staging, construction works and safety considerations associated with these activities.
  - 7.3 During the construction of the boathouse structure and marine rails authorised under Section 6 of this Development Permit, the Permittees will install silt fencing in an appropriate location between the development and Kootenay Lake to minimize the risk of sediment entering the foreshore area of Kootenay Lake.
  - 7.4 The Permittees will follow best management practices for the management of machinery, equipment, fuels, oils, lubricants and hydraulic fluids. Equipment will not be stored below the natural boundary of Kootenay Lake, will be regularly inspected and a designated staging area will be located greater than 15.0 metres from the natural boundary of Kootenay Lake for machinery and equipment storage, fueling and maintenance.
  - 7.5 The Permittees shall ensure that appropriate fish screening devices are installed at the intake of any water pipe utilised to obtain water from Kootenay Lake, and that any future water pipes are buried where possible.
  - 7.6 In accordance with Section 6 – Impacts and Recommendations of the Environmental Assessment Report prepared by Masse Environmental Consultants Ltd. and attached to this report as “Schedule 3 – Environmental Assessment Report”, the Permittees shall undertake the following works within 15m of the natural boundary of Kootenay Lake (the riparian area):
    - 7.6.1 To mitigate for the loss of riparian habitat caused by the proposed construction works authorised under Section 6 of this Development Permit the Permittees must undertake 260m<sup>2</sup> of riparian habitat enhancement in accordance with Section 7 – Mitigation Plan (including Section 7.1 – Non-native/ Weed Species Removal Methods and Section 7.2 – Riparian Planting Prescription) of the Environmental Assessment Report prepared by Masse Environmental Consultants Ltd. and attached to this report as “Schedule 3 – Environmental Assessment Report”. This riparian habitat enhancement should be conducted within the

'Enhancement Area' identified on the attached "Schedule 2 – Development Plans".

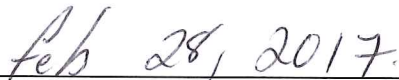
- 7.7 Further removal, alteration, disruption or destruction of soils and vegetation; installation of buildings or structures; installation of impervious or semi impervious pathways; development of flood protection works; or the construction of wharves or docks within the 15 metre Environmentally Sensitive Development Permit Area is strictly prohibited unless otherwise authorised by the Regional District of Central Kootenay.
  - 7.8 The Permittees are responsible for clearly communicating the terms of this permit to all agents, contractors, sub-agents and employees involved in all development authorized under Section 5 and Section 6 of this Development Permit.
- 8 As a condition of the issuance of this Permit, the Regional District shall hold an irrevocable **Letter of Credit** submitted by the Permittees in the amount of **\$2,500.00** to ensure the landscaping requirements as set forth in Section 7.6 are completed and in accordance with the following provisions:
- 8.1 A condition of the posting of the Letter of Credit is that should the Permittees fail to carry out the works and services as herein above stated, according to terms and conditions of this permit within the time provided, the Regional District may use the Letter of Credit to complete these works or services by servants, agents or contractors, and any surplus shall be paid over to the Permittee. If the amount of funds is insufficient to cover the actual cost of completing the works, then the Permittee shall pay such deficiency to the Regional District immediately upon receipt of the Regional District's bill for same.
  - 8.2 The Permittee shall complete the landscaping works required under Section 7.6 of this Development Permit within 24 months of the date of issuance of the Development Permit. Within this time period the required landscaping must be inspected and approved by the Regional District.
  - 8.3 If the landscaping is not completed within this time period, the Regional District has the option of continuing to renew the Letter of Credit until the required landscaping is completed or has the option of drawing from the Letter of Credit to complete the required landscaping. In this event, the Regional District or its agents have the irrevocable right to enter into the property to undertake the required landscaping for which the Letter of Credit was submitted.
  - 8.4 If the landscaping is approved within this time period without the Regional District having to draw the on the Letter of Credit, 90% of the original amount of the Letter of Credit shall be returned to the Permittee.
  - 8.5 A hold back of 10% of the original amount of the Letter of Credit shall be retained until a final inspection is undertaken within 12 months of the date of the original inspection and approval was given to the landscaping. If the landscaping receives approval at final inspection, the 10% hold back will be returned to the Permittee. If after the final inspection, approval of the

landscaping is not given, the Regional District has the option of continuing to renew the Letter of Credit until the required landscaping is approved or has the option of drawing on the Letter of Credit the funds to complete the required landscaping. In this event, the Regional District or its agents have the irrevocable right to enter onto the property to undertake the required landscaping for which the Letter of Credit was submitted.

- 9 The said lands shall be developed strictly in accordance with the terms and conditions of this Development Permit and the requirements of all applicable Regional District Bylaws as well as any plans and specifications which may, from time to time, be attached to this Permit shall form a part thereof.
- 10 In accordance with the Local Government Act, if the development authorized by this Development Permit is not commenced within two years of the date of this Permit, this Permit shall lapse.
- 11 In accordance with the Local Government Act, 'Notice' shall be filed in the Land Title Office that the said lands are subject to this Development Permit.
- 12 The terms of this Development Permit including subsequent amendments, are binding on all persons who acquire an interest in the said lands associated with this Permit.
- 13 It is understood and agreed that the Regional District has made no representations, covenants, warranties, guarantees, promises, or agreement (verbal or otherwise) with the Permittee other than those in this Development Permit. It is solely the responsibility of the Permittee to ensure that the requirements of all other applicable government agencies are satisfied.
- 14 This Development Permit does not constitute a building permit.
- 15 This Development Permit shall come into force and effect 14 days after the date of issuance unless a Waiver of Appeal is received from the Permittee at which time the Development Permit shall be deemed to be issued upon receipt of the Waiver of Appeal. OR If a Notice of Appeal is received the Development Permit shall be suspended until such time as the Board of the Regional District of Central Kootenay has decided the Appeal.



Sangita Sudan, General Manager of Development Services



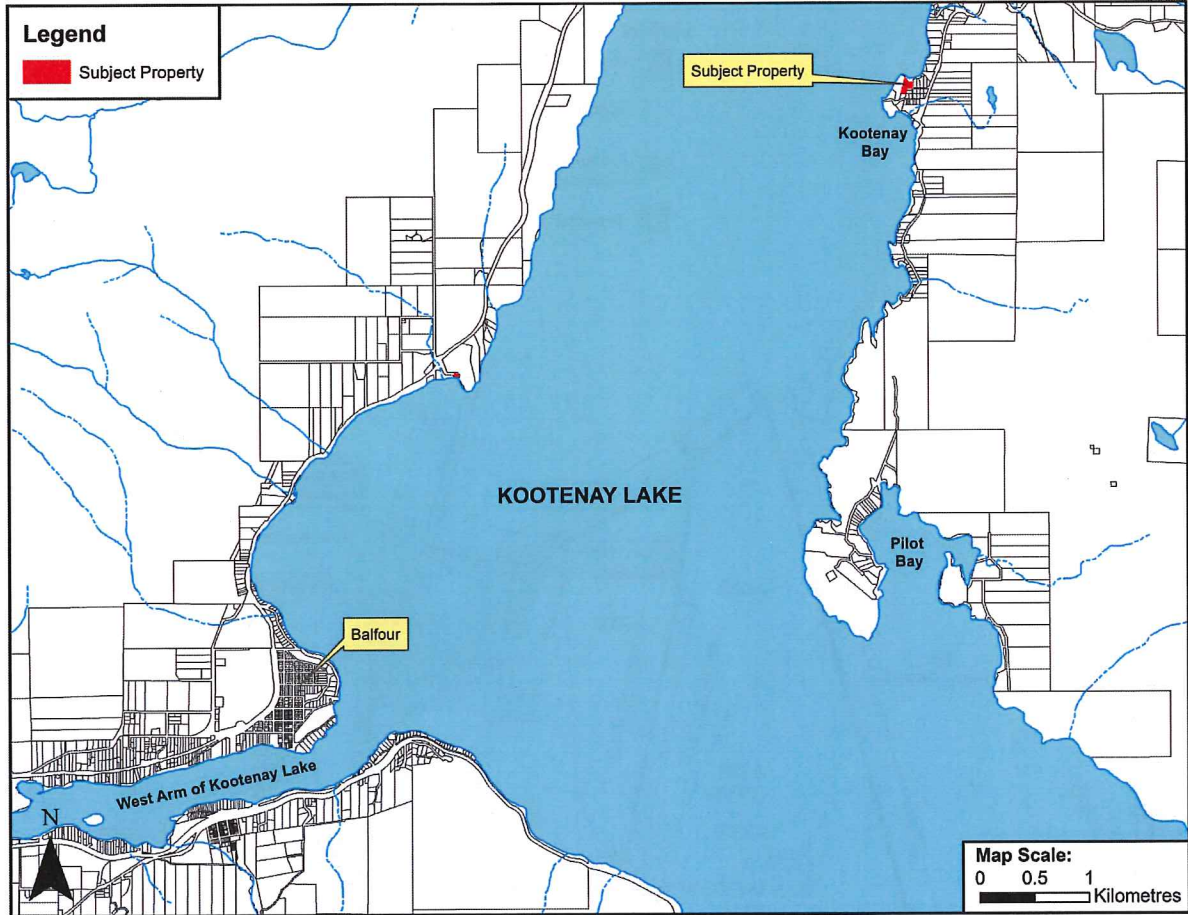
Date of Issuance

Schedule 1 - Location Map

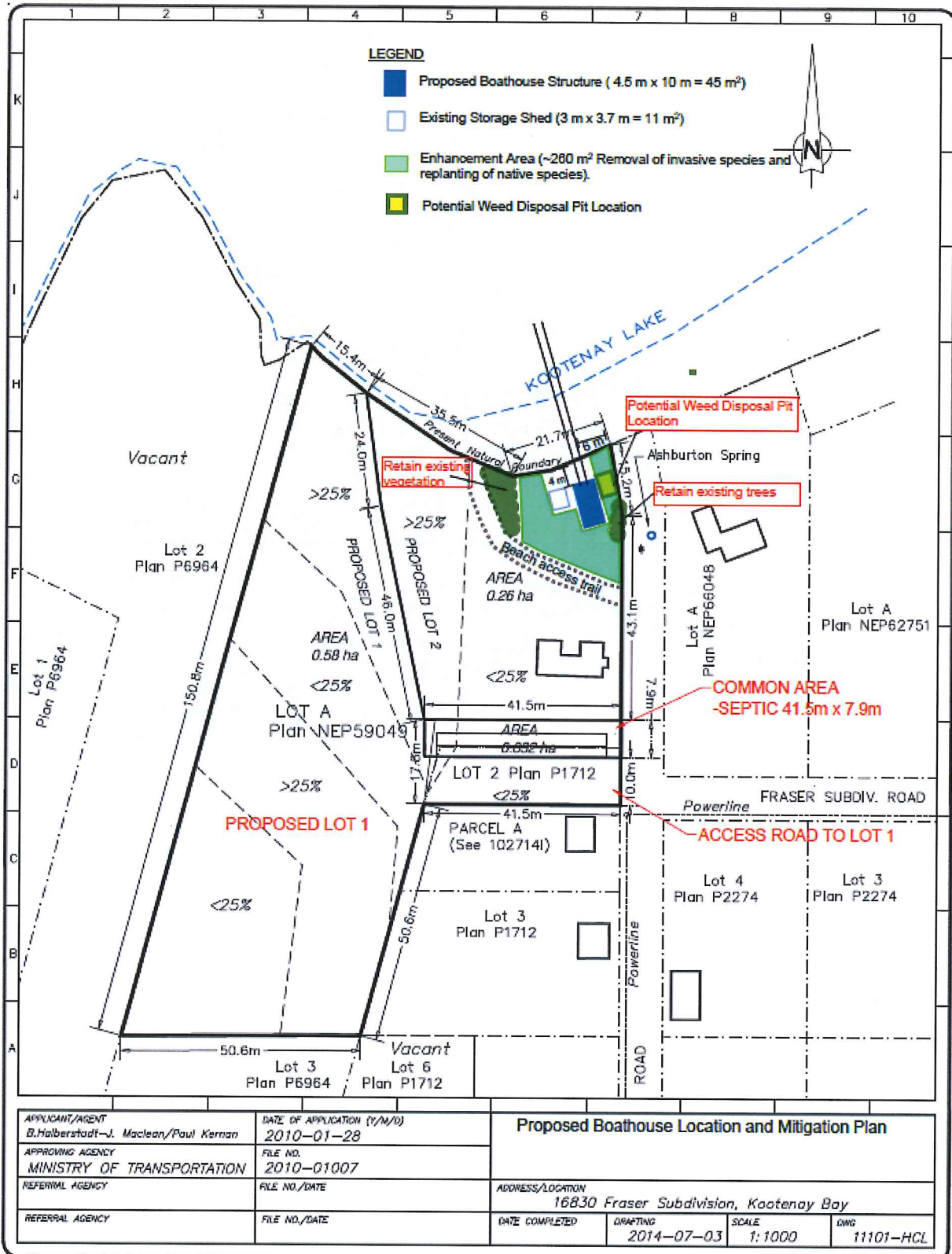
Schedule 2 – Development Plans

Schedule 3 – Environmental Assessment Report

Schedule 1 – Location Map



Schedule 2 – Development Plans



**Schedule 3 – Environmental Assessment Report**



**16828 FRASER SUBDIVISION ROAD  
KOOTENAY BAY, KOOTENAY LAKE  
Environmental Assessment**



Prepared for:  
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October 2016



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## 1 INTRODUCTION

Masse Environmental Consultants Ltd. (MEC) was retained by Brian Halberstadt, owner of 16828 Fraser Subdivision Road on Kootenay Lake (Appendix 1), to provide environmental consulting services in support of the proposed subdivision and construction of a boathouse and marine rails along the foreshore. The proposed subdivision and boathouse are located within the riparian area of Kootenay Lake, triggering the requirement for an environmentally sensitive development permit area (ESDPA) application.

A site visit was conducted on September 7, 2016 by Fiona Lau, ASCT., to assess the habitat values and potential impact of the proposed subdivision and boathouse on the riparian and foreshore areas.

This assessment evaluates the existing conditions of the foreshore and riparian areas, identifies important habitat values, assesses existing environmental impacts and recommends measures to protect environmentally sensitive areas for future development. It is based on the following regulatory framework and best management practices documents:

- Electoral Area 'A' Comprehensive Land Use Bylaw No. 2315.
- Riparian Areas Regulation
- Provincial Water Act
- General BMPs and Standard Project Considerations (Ministry of Environment)
- On the Living Edge: Your Handbook for Waterfront Living
- Develop with Care. Environmental Guidelines for Urban and Rural Land Development in British Columbia

This report has been prepared by Fiona Lau, ASCT. I, Fiona Lau, hereby certify that:

- a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the Fish Protection Act;
- b) I am qualified to carry out this part of the assessment of the development proposal made by the developer;
- c) I have carried out my assessment of the development proposal, and my assessment is set out in this Assessment Report; and
- d) In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation.

### 1.1 Location

The subject property, 16828 Fraser Subdivision Road (Lot A, District Lot 2155, Kootenay District, Plan NEP59049) is located along the east shore of Kootenay Lake, north of the Kootenay Bay Ferry Terminal. The subdivision is bordered by a Ministry of Transportation Right of Way (ROW) to the east, private property to the south and west and Crown Land to the north.

The project area is within the Interior Cedar Hemlock very dry warm variant (ICHxw) biogeoclimatic subzone (Mackillop and Ehman 2016). This transitional dry-moist climatic region is characterized by very

hot, very dry summers; and dry winters with low snowfall. Soils generally dry out in late summer for varying extents of time ranging from insignificant to extensive. Snow packs are moderately shallow and typically persist for a short duration in January and February. This subzone has the warmest winters of all biogeoclimatic units in southeast British Columbia.

During my site visit, we determined the visible High Water Mark (HWM) close to the present Natural Boundary (~534 m) shown on the survey attached ( Appendix 2). Based on the definition of natural boundary, the 534 m elevation will be used as the HWM from which the riparian setbacks will be measured.

**“Natural Boundary”** means the visible high water mark of any lake, river, stream or other body of water is where the presence and action of the water are so common and usual, and so long continued in all ordinary years, as to mark on the soil of the bed of the body of water a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself.”

(MOE 2016)

## 2 PROJECT OVERVIEW

The proposed development consists of subdivision of a 0.84 hectare lot into two parcels (Lot 1 =0.58 ha and Lot 2 = 0.26 ha), and the construction of a boathouse facility on Lot 2. The proposed boathouse construction includes a 45 m<sup>2</sup> boathouse structure and one set of marine rails that are required to transport a boat to and from the water. The proposed development is subject to approval by the following agencies:

1. RDCK Development Permit Application
2. BC Specific Permission for Private Moorage and Construction
3. BC Ministry of Forest, Lands and Natural Resource Operations (FLNRO) Water Act Section 9 Notification.

### 2.1 Proposed Boathouse and Marine Rails

The proposed boathouse has been designed to accommodate one boat will have a total surface area of 45 m<sup>2</sup> (4.5 m wide and 10.0 m long), and include one set of rails (1.37 m wide and ~32 m long) between the boathouse and the lake. The purpose of constructing the boathouse and marine rails is to have under-cover storage for the boat and to provide year round boat access to and from the water. The boathouse structure will be setback ~4 m from the HWM and sited entirely within the 15 meter setback (See Appendix 3 for proposed boathouse location). The marine rails will be sited 6 meters from the dedicated public access trail located east of the property line as per Transport Canada’s Navigable Water Act and encroach into Crown land by ~30 m.

### 3 HISTORICAL AND CURRENT LAND USES

#### 3.1 Existing Development

A single family residential home with detached outbuildings and a sundeck are located within Lot 2 (Photo 1). The home, sundeck and outbuildings are located >35 m from the HWM. Existing disturbance within the foreshore area includes:

- Storage shed (3m x 3.7m) located 4 m from the HWM (Photo 1);
- Access trail (~3-4m wide) from the house to the beach (Photo 2);
- Historical clearing of vegetation and soil disturbance within Lot 2;
- Fence along the east property line; and
- Moorage facility (breakwater and dock) fronting Lot 2 (Photo 4).

Lot 1 has no existing structures but has been partially disturbed by clearing and grading activities to create access to the property (outside of the riparian area), as well as some additional clearing of trees within the riparian area (Photos 5 and 6).

All structures and disturbance within the riparian setback were completed prior to 2012; therefore did not trigger the requirement for an environmental sensitive area development permit.



Photo 1. View of existing development (house and storage shed) on Lot 2.



Photo 2. View of access trail from house to beach on Lot 2.



Photo 3. View of sundeck located within trees at north-west corner of Lot 2.



Photo 4. View of moorage facility fronting Lot 2.



Photo 5. View of Lot 1 riparian area.



Photo 6. View of clearing conducted on top of the hill outside of the riparian area on Lot 1.

### 3.2 Water Supply

The existing home located on Lot 2 of the proposed subdivision uses Kootenay Lake as their water source. Water pipes are laid from the home through the riparian area, drawing water from the lake (Photo 7).



Photo 7. Water intake line for Lot 2.

### 3.3 Moorage Facilities

A moorage facility located in front of Lot 2 on crown land was constructed in 1992, and licenced by the Province in 2009. The moorage facility consists of vertical log cribbing walls along the shoreline, a large breakwater (~24 m long by ~5 m wide and 3-4 m high), and a wood dock (~14 m long x 1.5 m wide). The bay area created behind the breakwater is used during mid to high water levels; however during the winter months when water levels are low the bay area is too shallow for boats to access.



Photo 8. North-west view of breakwater structure, log cribbing and dock.



Photo 9. South-east view of dock and log cribbing along shoreline.

### 3.4 Services and Site Drainage

Sewage disposal for both properties will be a common septic field located on the south side of Lot 1 (See Appendix 2 for location). There were no drainage issues observed within the riparian area of the proposed subdivision.

#### 4 STREAMSIDE PROTECTION AND ENHANCEMENT AREA (SPEA)

To determine whether the development permit area (DPA) aligns with the criteria in the Riparian Area Regulation (RAR), a detailed assessment of the site was conducted to calculate the streamside protection and enhancement area (SPEA) for Kootenay Lake on the proposed subdivision site. The variances in the “Shade” setback differ within this particular property because of the different aspects of the shoreline. The SPEA is determined by the using the largest Zone of Sensitivity. Results for the Zones of Sensitivity (ZOS) and SPEA are presented in Table 1 below and shown on the site plan in Appendix 2.

Table 1. Results of detailed assessment.

Feature Type	Lot #	SPVT	Zones of Sensitivity			SPEA
			LWD	Litter fall	Shade	
Lake	1	TR	15 m	15 m	23-25 m	23-25 m
	2	TR	15 m	15 m	22-30 m	22-30 m

SPVT- site potential vegetation type (TR-tree)

LWD- large woody debris

SPEA- streamside protection and enhancement area

#### 5 RESOURCES

##### 5.1 Fish and Fish Habitat

Typically, Kootenay Lake experiences two seasonal water level increases annually. The first increase is observed in April during low elevation snowmelt followed by a more substantial secondary rise in water levels due to high elevation snowmelt in June. Lake levels can vary by up to 4 m throughout the year, affecting the extent of exposed shoreline.

The foreshore consists mostly of a pebble beach area located in front of Lot 2 and rocky shoreline on the west side of Lot 2 and in front of Lot 1. The beach area consists predominantly of pebbles with some impoundments of gravel (Photos 10 and 11) and has an average gradient of 16%. There were no observations of emergent vegetation along the foreshore. The shallow water along the beach areas provides rearing habitat for fry and juveniles. The rocky shoreline consists predominantly of exposed bedrock with overlying angular boulders and cobbles and has an average gradient of >30% (Photos 12 and 13). The rocky shoreline provides potential rearing and cover habitat for juvenile and adult fish. No aquatic vegetation was observed within this segment.





Photo 10. East view of beach area in front of Lot 2.



Photo 11. Pebble substrate located along the beach in front of Lot 2



Photo 12. View of rocky shoreline in front of Lot 1.



Photo 13. View of boulder and cobble substrate overlying bedrock in front of Lot 1.

Kootenay Lake supports a variety of fish species (Table 2), including several species of regional interest, such as Rainbow Trout, Bull Trout, Kokanee, White Sturgeon, Westslope Cutthroat Trout, and Burbot.

Table 2. Fish species present in Kootenay Lake.

Species	Scientific Name	Comments
Burbot	<i>Lota lota</i>	Kootenay Lake population is red listed
Bull Trout	<i>Salvelinus confluentus</i>	Blue-listed species
Brook Trout	<i>Salvelinus fontinalis</i>	Introduced species
Kokanee	<i>Oncorhynchus nerka</i>	
Largemouth Bass	<i>Micropterus salmoides</i>	Introduced species
Largescale Sucker	<i>Catostomus macrocheilus</i>	
Longnose Dace	<i>Rhinichthys cataractae</i>	
Longnose Sucker	<i>Catostomus catostomus</i>	
Lake Whitefish	<i>Coregonus clupeaformis</i>	
Mountain Whitefish	<i>Prosopium williamsoni</i>	
Northern Pikeminnow	<i>Ptychocheilus oregonensis</i>	

Species	Scientific Name	Comments
Peamouth Chub	<i>Mylocheilus caurinus</i>	
Pumpkinseed	<i>Lepomis gibbosus</i>	Introduced species
Prickly Sculpin	<i>Cottus asper</i>	
Pygmy Whitefish	<i>Prosopium coulteri</i>	
Rainbow Trout	<i>Oncorhynchus mykiss</i>	
Redside Shiner	<i>Richardsonius balteatus</i>	
Slimy Sculpin	<i>Cottus cognatus</i>	
Torrent Sculpin	<i>Cottus rhotheus</i>	
Westslope Cutthroat Trout	<i>Oncorhynchus clarki lewisi</i>	Blue-listed species
White Sturgeon	<i>Acipenser transmontanus</i>	Kootenay Lake population is red-listed
Yellow Perch	<i>Perca flavescens</i>	Introduced species

(MOE, 2016)

## 5.2 Riparian Vegetation

### 5.2.1 Kootenay Lake

The riparian area along Kootenay Lake is considered habitat located within the 22 m – 30 m riparian setback from the HWM depending on the foreshore aspect. The riparian area along the lake has a mostly northern aspect. This area has a slope of ~14% from the beach and gradually increases to ~25% towards the house. The riparian area within the eastern portion of Lot 2 has been historically disturbed by a previous owner, where almost all of the native vegetation has been removed. Non-native/ weed species including Bamboo sp. (*Bambusoideae sp.*), Himalayan blackberry (*Rubus armeniacus*) and great mullein (*Verbascum thapsus*) have established in this area (Photo 14).

The western portion of Lot 2 remains mostly undisturbed, except for the areas where the access path and sundeck were constructed. This area consists of young to mid seral coniferous trees, mostly low shrub cover with mosses overlying shallow soils on rocky terrain. Shrubs consist of Salal (*Gaultheria shallon*), Nootka Rose (*Rosa nutkana*) and Sitka Mountain-ash (*Sorbus sitchensis*). A couple of Mountain Alder (*Alnus incana*) and Willow sp. (*Salix sp.*) exist along the lower elevations close to the shoreline.

Lot 1 is mostly rocky with a mixture of seedlings, sparse mid-seral coniferous trees and shrub layer vegetation consisting of Salal and mosses sp. (Photos 16 and 17). The gradients are quite steep within the first 30 meters ranging from 20% to 65% with minimal top soil layers and exposed bedrock throughout. There is a grade break which occurs between 20-30 m from the HWM where the topography slightly decreases in slope to a gradient of ~33% (Photo 16). Many of the trees within the 30 m setback are expected to have shallow rooting systems due to the lack of soils and available nutrients and may be susceptible to windthrow and erosion.

Salal occurs rarely in the Kootenays and is mostly found on the West Coast of BC. This type of ecosystem containing salal as a dominant shrub species within an ICHxw ecosystem is only known to occur in a few areas in the West Kootenays. This vegetation community is not considered a "rare" ecosystem by the Conservation Data Center (CDC); however the CDC has shown interest in identifying these sites to determine whether the conservation status of this ecosystem should be changed.



Photo 14. View of riparian area looking directly north along the eastern portion of Lot 2.



Photo 15. View of access path and forested area along the western portion of Lot 2.



Photo 16. View of rocky riparian area within Lot 1.



Photo 17. View of salal growing on rocky riparian slopes on Lot 1.

Table 3 provides a list of native plant and weed species encountered on the property within the riparian area of Kootenay Lake.

Table 3. Kootenay Lake riparian area native plant and weed species.

Species Name	Latin Name	Species Name	Latin Name
<b>Trees</b>		<b>Shrubs cont.</b>	
Western Hemlock	<i>Tsuga heterophylla</i>	Nootka Rose	<i>Rosa nutkana</i>
Interior Douglas fir	<i>Pseudotsuga menziesii</i>	Oregon Grape	<i>Mahonia aquifolium</i>
Lodgepole Pine	<i>Pinus contorta</i>	<b>Herbaceous</b>	
Ponderosa Pine	<i>Pinus ponderosa</i>	Bracken Fern	<i>Pteridium aquilinum</i>
Western Red Cedar	<i>Thuja plicata</i>	Pasture Sage	<i>Artemisia frigida</i>
<b>Shrubs</b>		Pearly Everlasting	<i>Anaphalis margaritacea</i>
Salal	<i>Gaultheria shallon</i>	Moss sp.	
Western Mountain Ash	<i>Sorbus sitchensis</i>	Lichen sp.	

Species Name	Latin Name	Species Name	Latin Name
Willow sp.	<i>Salix sp.</i>	Grasses sp.	
Mountain alder	<i>Alnus incana</i>	<b>Exotics and Weeds</b>	
Princes Pine	<i>Chimaphila umbellata</i>	Bamboo sp.	<i>Bambusoideae sp.</i>
Falsebox	<i>Pachistima myrsinites</i>	Himalayan Blackberry	<i>Rubus armeniacus</i>
Kinnikinnick	<i>Arctostaphylos var. uva-ursi</i>	Great Mullein	<i>Verbascum thapsus</i>
Thimbleberry	<i>Rubus parviflorus</i>	Oxeye Daisy	<i>Leucanthemum vulgare</i>
Mountain Alder	<i>Alnus incana</i>	Bull Thistle	<i>Cirsium vulgare</i>

### 5.3 Wildlife

#### 5.3.1 Reptiles and Amphibians

The cooler northern aspect of this property is considered unlikely to attract reptiles or western skinks as these ectothermic species tend to prefer warm south or west facing rocky slopes. There was no incidental observations made of the presence of these species during the site visit. The western skink is a blue listed species in BC, with the nearest confirmed siting in Pilot Bay Provincial Park, ~4.0 km south of the subject property (CDC 2016). For the purpose of this report, further studies would not be required.

#### 5.3.2 Birds

The mid-seral conifer trees located on the property favours species such as cavity dwellers, songbirds and raptors. A visual assessment did not identify any raptor nests and/or habitat trees with cavity nests.

#### 5.3.3 Mammals

The property most likely sees some ungulate use; however with the steep rocky slopes within the riparian area of Lot 1, and minimal evidence of wildlife trails and grazing potential within the property, it is not considered to be heavily used by ungulates.

### 5.4 Species at Risk

#### 5.4.1 Wildlife Species at Risk

Thirty three terrestrial vertebrate species at risk are known to occur within the ICH biogeoclimatic zone in the Kootenay Lake Forest District (CDC 2016). Of these, ten species are estimated to 'possibly' occur on site: Grizzly Bear (*Ursus arctos*), Western Skink (*Plestiodon skiltonianus*), Great Blue Heron (*Ardea herodias herodias*), Short-eared Owl (*Asio flammeus*), Olive-sided Flycatcher (*Contopus cooperi*), Black Swift (*Cypseloides niger*), Bobolink (*Dolichonyx oryzivorus*), Barn Swallow (*Hirundo rustica*), Western Screech Owl (*Megascops kennicottii macfarlanei*), Lewis's Woodpecker (*Melanerpes lewis*), Western Grebe (*Aechmophorus occidentalis*), and American Badger (*Taxidea taxus*).

#### 5.4.2 Vascular and Non-vascular Plant Species at Risk

Twenty three vascular plant species at risk are known to occur within the ICH biogeoclimatic zone in the Kootenay Lake Forest District (CDC 2016). Of these, three 'possibly' occur on site (Nuttalls Waterweed

(*Elodea nuattalii*), Orange Touch-me-not (*Impatiens aurella*) and Spurless Touch-me not (*Impatiens ecornuta*)). No non-vascular species at risk are known to occur within the ICH biogeoclimatic zone in the Kootenay Lake Forest District (CDC 2016).

### 5.5 Potential Environmental Hazards

The riparian area was assessed for potential environmental hazards such as slope stability indicators and hazard trees. Field indicators listed in Table 3.8 of the RAR were reviewed while on site to identify the presence of any potential indicators.

One large standing dead Douglas Fir Tree (380 mm diameter at breast height (DBH)) was identified within the assessment area on Lot 2 (UTM 509126 5502947). It is recommended that this tree be removed if considered a hazard by a Professional Arborist or Registered Professional Forester (RPF).

## 6 IMPACTS AND RECOMMENDATIONS

The following section describes impacts to ecological values (fisheries, vegetation and wildlife) and recommends measures to protect the integrity of SPEA. The SPEA was determined to be at setbacks from 22 m to 30 m from the HWM of Kootenay Lake. The recommended riparian setback for Lot 1 is 23-25 m and Lot 2 is 22-30 m. The setback ranges in size dependent on the aspect of the shoreline at that location (Setback lines are outlined in Appendix 2).

### 6.1 Fisheries Impacts

The breakwater structure is ~24 m long and ~5 m wide directly impacting ~ 120 m<sup>2</sup> of lakebed, resulting in some loss of shallow water habitat during low lake levels. The large size boulder material used along some sections of the breakwater provides good interstitial cover habitat for fish. However, fish movement parallel to shore is likely impeded and small fish are forced into deeper areas where they are more susceptible to predation by larger fish. Breakwaters have the potential to affect current patterns and disrupt natural sediment transport along the lake foreshore and accounts for the build-up of fine substrate material within the bay and beach area.

The footprint of the proposed marine rail system located below the natural boundary is ~41 m<sup>2</sup> (1.37 m wide x 30 m long). Minimal disturbance to the foreshore is expected to be caused by the placement of the rails, since the rail system sits on the lake bed and does not incorporate an anchoring system. The system has been designed so that waves pass through the rails, causing minimal movement of the structure on the lakebed and is made of galvanized metal/aluminum which will not rust or leach into the water (Photo 18).



Photo 18. Example of marine rails.

***Recommendations:***

The following mitigation measures are recommended to reduce the impact of the proposed development on fisheries values:

- Riparian buffer along Kootenay Lake be maintained as a no-construction zone with the exception of foreshore access and the proposed boathouse structure. Any activities proposed within the riparian setback should be assessed by a Qualified Environmental Professional (QEP) prior to construction.
- Removal of riparian vegetation should be avoided. If vegetation removal is unavoidable (i.e. access stairs to foreshore) it should be minimized as much as possible.
- All works in and about Kootenay Lake will require a Water Sustainability Act Change Approval or notification application.
- Revegetate exposed soils with native vegetation as soon as possible.
- Implement and maintain erosion and sediment control plans during construction.
- Concentrate shoreline alterations in one area and ensure shoreline accesses, structures and pathways are narrow.
- Minimize water pipe diameter and ensure that fish screens are placed at the intake.

**6.2 Vegetation Impacts**

Overall existing vegetation impacts on the property are considered moderate with the greatest impact observed on Lot 2 by historical clearing activities and introduction of non-native and weed plant species. Selective clearing within the riparian setback has taken place on Lot 1; however minimal ground disturbance was observed and the riparian vegetation is mostly intact.

The proposed boathouse on Lot 2 will cause a net habitat loss of 45 m<sup>2</sup> within the riparian zone. The proposed boathouse will be located in an area that has been historically disturbed and where Himalayan

Blackberry and Bamboo are established. The marine rails will be located on an existing grassy area; therefore will cause minimal impact to existing vegetation.

### ***Recommendations***

The following mitigation measures are recommended to reduce the impact of the proposed development on vegetation:

- Retain natural vegetation within the riparian setback to maintain shoreline stability and habitat complexity.
- Remove non-native vegetation within a (305 m<sup>2</sup>) area within the riparian area of Lot 2.
- Revegetate exposed soils with native vegetation as soon as possible.
- Concentrate shoreline alterations in one area and ensure shoreline access, structures and pathways.
- Stairs and decks within the riparian area should be elevated from the ground to allow light penetration, promoting vegetation growth.
- Build elevated stairs with landings instead of a path on steep slopes to access the waterfront to reduce erosion and removal of vegetation.
- Install permeable upland surfaces for future development that permit rainwater infiltration, moderating storm water volume, timing and velocity.
- Maintain the natural drainage on the site as much as possible.
- Remove non-native weed species throughout the properties.
- Future water pipes for Lot 1 to be buried where possible.

### **6.3 Wildlife Impacts**

Riparian zones allow wildlife to travel between habitat "islands" by providing migration corridors between upland areas and water, as well as along the foreshore. They also help circulate nutrients between terrestrial and aquatic ecosystems. The proposed subdivision is considered to have minimal impact to migration corridors from upland areas to the foreshore due to the steep terrain and existing development; however migration parallel to the foreshore could be impacted by future development if best management practices are not met. The existing trees with the riparian area provide potential perch and nesting habitat for birds and raptors. The following mitigation measures are recommended to reduce the impact of the proposed development to wildlife:

#### ***Recommendations:***

- Design access to the foreshore to allow for wildlife movement across the riparian area.
- To protect nesting bird species, clearing of trees and vegetation should be conducted outside of the songbird breeding season (April 1-August 15). If clearing is to occur during the songbird breeding season a Qualified Environmental Professional should assess presence of active nests within areas to be cleared.
- Live and dead trees, especially deciduous trees, over 30 cm DBH should be retained, unless considered a hazard.

## 7 MITIGATION PLAN

To mitigate for the loss of 45 m<sup>2</sup> of riparian habitat caused by the proposed construction of the boathouse structure, ~260 m<sup>2</sup> of riparian habitat enhancement is proposed within the 25 meter setback area (Refer to Appendix 3 for Mitigation Plan). In order to enhance and restore biodiversity within the riparian zone, the following is recommended:

- Remove non-native/weed species (Himalayan Blackberry, Bamboo, and Great Mullein) from riparian area on Lot 2 (See Section 7.4.1 for Non-native Species Removal Methods).
- Plant a mixture of native plant species within the 260 m<sup>2</sup> area where non-native species have been removed (See Section 7.4.2 for Planting Prescription).

### 7.1 Non-native/ Weed Species Removal Methods

It is recommended that all non-native/weed species within the riparian area north of the access trail be removed (~305 m<sup>2</sup>). These species can spread by fragments, so it is important to contain them during the removal and disposal activities. The following removal methods are prescribed for this site:

- In the springtime cut bamboo culms just above ground level using garden clippers or chainsaw. Culms can be stockpiled, dried out and burned. Using an excavator, remove rhizomes (root systems) immediately after culms are cut and stockpile on a tarpaulin or polyethylene sheet.
- Using an excavator, remove Himalayan Blackberry and Mullein by the roots.
- Excavate a weed disposal pit in the desired location. Pit should be a minimum of 1.5 meter deep and allow for 0.5m of soil cover. The pit should be lined with a 6mm permeable membrane. Then place bamboo culms, blackberry and Mullein into pit. Cover with a 6 mm permeable membrane, 4-6" layer of crush gravel and top with imported backfill and top soil (>30 cm), and mound where possible to allow for natural settling. Blackberry and Mullein may also be burned.
- Disposal pit should be re-seeded with native grass seed and planted with recommended native plant species.

An alternate option to burning and burying the plant waste is to double bag the plants and dispose of at a landfill; however due to the volume of plant waste expected from this site, the burial option is considered to be more practical.

### 7.2 Riparian Planting Prescription

The area proposed for enhancement (260 m<sup>2</sup>) within the 30 meter setback has been selected to be planted with a mixture of native trees, shrubs, and grasses (See Appendix 3 for Mitigation Plan). Alternatively, additional native plants listed in the "Grow Me Instead" brochure (Invasive Species Council of British Columbia 2013) can also be used. Table 4 below provides a detailed list of the recommended riparian plant species for the enhancement area.



Table 4. Recommended plant species

Common Name	Latin Name	Recommended Pot Size
<b>Trees</b>		
Western Red Cedar	<i>Thuja Plicata</i>	#2 or larger
Western White Pine	<i>Pinus monticola</i>	#2 or larger
Interior Douglas Fir	<i>Pseudotsuga menziesii</i>	#2 or larger
Western Yew	<i>Taxus brevifolia</i>	#2 or larger
Paper Birch	<i>Betula papyrifera</i>	#2 or larger
Western Hemlock	<i>Tsuga heterophylla</i>	#2 or larger
<b>Shrubs</b>		
Red Osier Dogwood	<i>Cornus stolonifera</i>	#1 or larger
Sandbar Willow	<i>Salix exigua</i>	#1 or larger
Scoulers Willow	<i>Salix scouleriana</i>	#1 or larger
Douglas Maple	<i>Acer glabrum</i>	#1 or larger
Mallow Ninebark	<i>Physocarpus malvaceus or</i>	#2 or #5
Oceanspray	<i>Holodiscus discolor</i>	#2 or #5
Cascara	<i>Rhamnus purshiana</i>	#2 or #5
Kinnikinnick	<i>Arctostaphylos uva-ursi</i>	#1
Oregon Grape	<i>Mahonia aquifolium</i>	#1
Red Flowering Currant	<i>Ribes sanguineum</i>	#1 or larger
Sword Fern	<i>Polystichum munitum</i>	#1
Western Mountain Ash	<i>Sorbus sitchensis</i>	#2 or #5
Pacific Willow	<i>Salix lucida</i>	#1 or larger
Blue Elderberry	<i>Sambucus caerulea</i>	#2 or #5
Nootka Rose	<i>Rosa nutkana</i>	#1 or larger
<b>Grasses</b>		
Native Tufted Hairgrass	<i>Deschampsia cespitosa</i>	#1 or larger
Bluejoint Grass	<i>Calamagrostis canadensis</i>	#1 or larger
Native grass seed blend	(Consult with native seed supplier)	

Planting should be completed in the spring or fall. Planting placement and arrangement within each planting area will be at the discretion of the Owner/Landscaper. Additional plants may be added to the riparian area to fill in spaces if desired. It is recommended that trees be planted at minimum 3 m spacing, shrubs to be planted at minimum 1 m spacing and grasses and flowers to be planted at minimum 50 cm spacing.

### 7.3 Acquiring Native Plant Stock

Nurseries located as close to the planting sites as possible are recommended to ensure the genetic integrity of selected species are as ecologically appropriate as possible. The species composition and sizing may be subject to minor changes from what is proposed in this plan. Careful transportation to the site is critical to plant survivability. Native plant stock can be obtained from the nurseries listed in Table 5.

Table 5. Native plant nurseries.

Sagebrush Nursery 38206 93 <sup>rd</sup> St. RR 2 Oliver, BC V0H 1T0 (250) 498-8898	Tipi Mountain Native Plants Box 946 Cranbrook BC V1C 4J6 (250) 427-7010
PRT Harrop 6320 Harrop - Procter Road Nelson, BC Canada V1L 6P9 Phone: (250) 229-5353	

## 8 CONCLUSION

The proposed development, if completed with the mitigation measures recommended, is expected to have limited impact to the riparian zone. The removal of non-native vegetation and the planting of native species on Lot 2 is expected to enhance riparian and wildlife values. It is recommended that the proposed riparian setbacks be maintained as a no-construction zone, with the exception of foreshore access and the proposed boathouse structure on Lot 2. Any additional activities proposed within the riparian setbacks should be assessed by a QEP prior to construction.

## 9 CLOSURE

I, Fiona Lau, certify that I am qualified to carry out this assessment; and that the assessment methods under the Regulation have been followed; and that, in my professional opinion:

- (i) if the development is implemented as proposed, or
- (ii) if the streamside protection and enhancement areas identified in the report are protected from the development, and
- (iii) if the developer implements the measures identified in the report to protect the integrity of those areas from the effects of the development,

then there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian assessment area.

**Prepared by:**



**Fiona Lau, ASCT.**

**Reviewed by**

A handwritten signature in blue ink, appearing to read 'Ico de Zwart', is written over the printed name below.

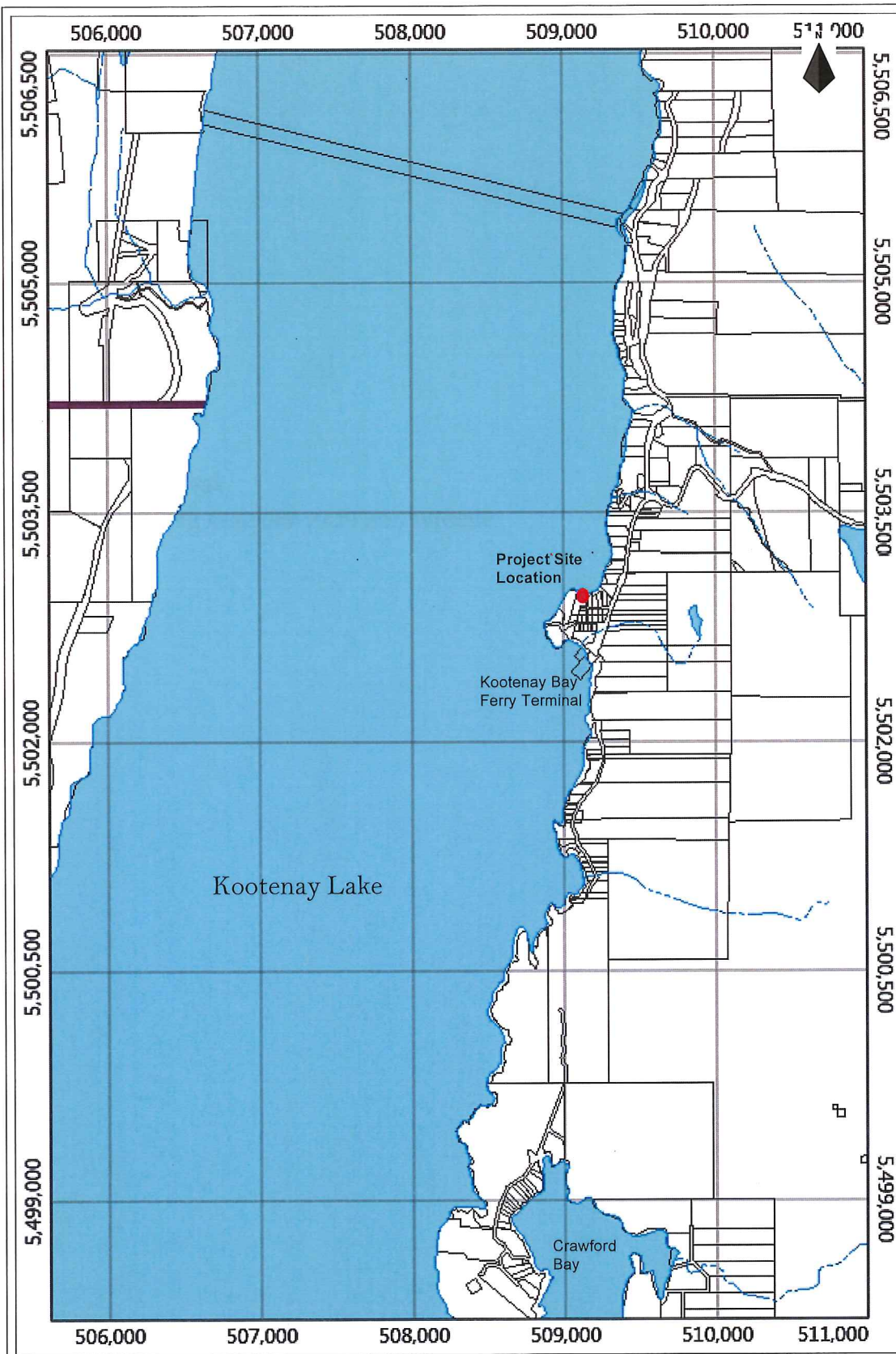
**Ico de Zwart, Ph.D., R.P.Bio.**

## 10 REFERENCES

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- Timber Press.2016. Accessed website on October 2016 <https://www.timberpress.com/blog/2013/05/how-to-dispose-of-non-native-plants/>
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**APPENDIX 1**  
**LOCATION MAP**





# RDCK Map


**Legend**

-  Streams
-  Cadastre / Property Li
-  Lakes (Mid Scale)
-  Electoral Boundaries (

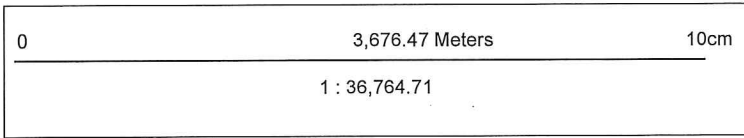
**Notes**

Map Details

Date Plotted: 10/12/2016



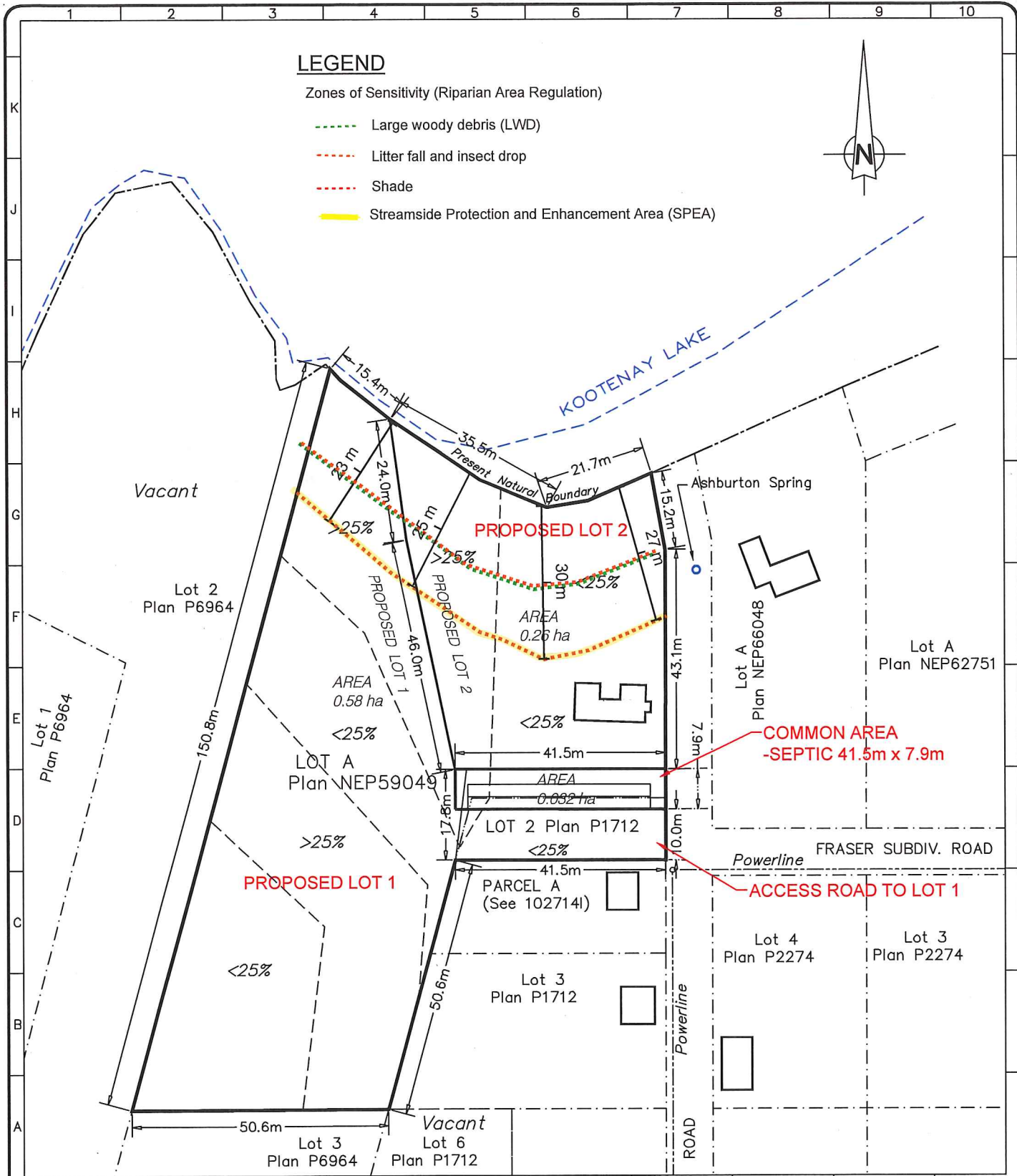
202 Lakeside Drive  
 Nelson, BC  
 1-800-268-7325  
<http://www.rdck.ca>



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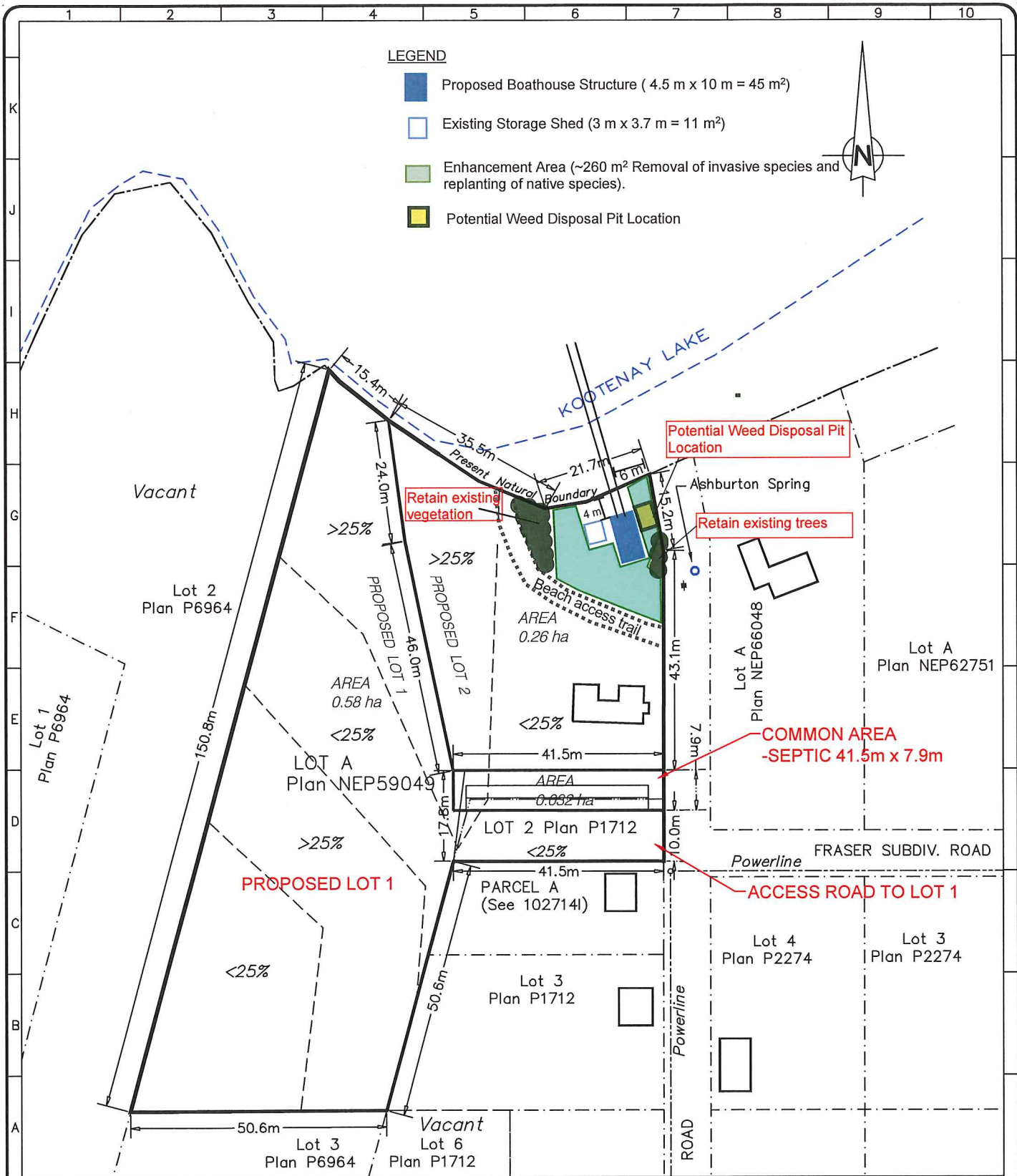
**APPENDIX 2**  
**SUBDIVISION PLAN AND SPEA SETBACKS**





APPLICANT/AGENT B. Halberstadt-J. Maclean/Paul Kernan		DATE OF APPLICATION (Y/M/D) 2010-01-28		Subdivision Plan and SPEA Setback Plan				
APPROVING AGENCY MINISTRY OF TRANSPORTATION		FILE NO. 2010-01007		ADDRESS/LOCATION 16830 Fraser Subdivision, Kootenay Bay				
REFERRAL AGENCY		FILE NO./DATE		DATE COMPLETED		DRAFTING 2014-07-03	SCALE 1:1000	DWG 11101-HCL

**APPENDIX 3**  
**PROPOSED BOATHOUSE LOCATION AND MITIGATION PLAN**



APPLICANT/AGENT B.Halberstadt-J. Maclean/Paul Kernan	DATE OF APPLICATION (Y/M/D) 2010-01-28	Proposed Boathouse Location and Mitigation Plan			
APPROVING AGENCY MINISTRY OF TRANSPORTATION	FILE NO. 2010-01007	ADDRESS/LOCATION 16830 Fraser Subdivision, Kootenay Bay			
REFERRAL AGENCY	FILE NO./DATE	DATE COMPLETED	DRAFTING	SCALE	DWG
REFERRAL AGENCY	FILE NO./DATE		2014-07-03	1:1000	11101-HCL