



**REGIONAL DISTRICT OF CENTRAL KOOTENAY**  
**BOX 590, 202 Lakeside Drive, NELSON, BC V1L 5R4**  
 ph: 250-352-8165 fax:250-352-9300  
 email: [plandept@rdck.bc.ca](mailto:plandept@rdck.bc.ca)

**REFERRAL FORM**  
**DEVELOPMENT PERMIT APPLICATION RDCK**  
**Planning File: D2112D**  
**Date: August 10, 2021**

**You are requested to comment on the attached DEVELOPMENT PERMIT for potential effect on your agency's interests. We would appreciate your response WITHIN 30 DAYS (PRIOR TO September 10, 2021). If no response is received within that time, it will be assumed that your agency's interests are unaffected.**

**LEGAL DESCRIPTION & GENERAL LOCATION:**

5278 AMUNDSEN ROAD, MIRROR LAKE, ELECTORAL AREA D  
 LOT 1 PLAN NEP22516 DISTRICT LOT 7386 KOOTENAY LAND DISTRICT (PID: 023-195-738)

**PRESENT USE AND PURPOSE OF PERMIT REQUESTED:**

This development proposal would be part of The Sentinel Retreat and Wellness Center, which operates on both 5308 and 5278 Amundsen Road. In 2017, a Development Permit ((DP) - RDCK File#D1703D) to allow the construction of two amenity buildings, pathways and utility lines was issued for the subject property. In July 2021, a DP (RDCK File#D2112D) was issued for 5208 Amundsen Road, which allowed for the construction of five two-storey pre-fabricated duplexes, a new septic field, landscaping, fire pit zone, driveway access and parking area.

This current proposal includes a new access path to the beach and dock, and a new foreshore trail and seating area within the Watercourse Development Permit Area (WDPA) area of Kootenay Lake, and relocation of the existing unauthorized guesthouse to outside of the WDPA. Under the *Electoral Area 'D' Comprehensive Land Use Bylaw No. 2435, 2016*, the WDPA extends 30 metres upland from the high water mark of watercourse. The purpose of the WDPA is to regulate development activities in watercourses and their riparian areas to protect aquatic habitat; and to conserve, enhance and, where necessary, restore watercourses and their riparian areas. A site specific floodplain exemption application may also be required.

AREA OF PROPERTY	ALR STATUS	ZONING	OCP
1.2 hectares	N/A	N/A	Country Residential

**APPLICANT:** 52785308 AMUNDSEN ENTERPRISES INC. c/o Richard Kay

**OTHER INFORMATION: ADVISORY PLANNING COMMISSION PLEASE NOTE:**

If your Advisory Planning Commission plans to hold a meeting to discuss this Development Permit application, please note that the applicants must be provided with an opportunity to attend such meeting, in accordance with Section 461, subsection (8) of the *Local Government Act*, which reads as follows:

*"If the commission is considering an amendment to a plan or bylaw, or the issue of a permit, the applicant for the amendment or permit is entitled to attend meetings of the commission and be heard."*

**Please fill out the Response Summary on the back of this form. If your agency's interests are 'Unaffected' no further information is necessary. In all other cases, we would appreciate receiving additional information to substantiate your position and, if necessary, outline any conditions related to your position. Please note any legislation or official government policy which would affect our consideration of this permit.**

**STEPHANIE JOHNSON, PLANNER**  
**REGIONAL DISTRICT OF CENTRAL KOOTENAY**

TRANSPORTATION <input checked="" type="checkbox"/> West Kootenay District Office, Nelson <input checked="" type="checkbox"/> HABITAT BRANCH (Environment) FRONT COUNTER BC (FLNRORD) <input checked="" type="checkbox"/> Nelson	REGIONAL DISTRICT OF CENTRAL KOOTENAY DIRECTORS FOR: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F <input type="checkbox"/> G <input type="checkbox"/> H <input type="checkbox"/> I <input type="checkbox"/> J <input type="checkbox"/> K ALTERNATIVE DIRECTORS FOR: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F <input type="checkbox"/> G <input type="checkbox"/> H <input type="checkbox"/> I <input type="checkbox"/> J <input type="checkbox"/> K
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- Cranbrook
- AGRICULTURAL LAND COMMISSION
- REGIONAL AGROLOGIST
- ENERGY & MINES
- MUNICIPAL AFFAIRS & HOUSING
- INTERIOR HEALTH
- HBE Team, Nelson
- KOOTENAY LAKES PARTNERSHIP  
(FORESHORE DEVELOPMENT PERMITS)
- SCHOOL DISTRICT NO.
- WATER SYSTEM OR IRRIGATION DISTRICT
- UTILITIES (FORTIS, BC HYDRO, NELSON  
HYDRO, COLUMBIA POWER)

- APC AREA **D**
- RDCK FIRE SERVICES
  - District Chief Nora Hannon – Kaslo, Balfour, Harrop, North Shore & Ymir
  - District Chief George Hamm – Pass Creek, Ootischenia, Robson, Tarry’s & Beasley
  - District Chief Gord Ihlen – Crescent Valley, Passmore, Winlaw, Slocan & Blewett
- RDCK EMERGENCY SERVICES
- RDCK BUILDING SERVICES
- RDCK UTILITY SERVICES
- RDCK RESOURCE RECOVERY
- RDCK REGIONAL PARKS

INSERT COMMENTS ON REVERSE . . .

The personal information on this form is being collected pursuant to *Regional District of Central Kootenay Planning Procedures and Fees Bylaw No. 2457, 2015* for the purpose of determining whether the application will affect the interests of other agencies or adjacent property owners. The collection, use and disclosure of personal information are subject to the provisions of FIPPA. Any submissions made are considered a public record for the purposes of this application. Only personal contact information will be removed. If you have any questions about the collection of your personal information, contact the Regional District Privacy Officer at 250.352.6665 (toll free 1.800.268.7325), [info@rdck.bc.ca](mailto:info@rdck.bc.ca), or RDCK Privacy Officer, Box 590, 202 Lakeside Drive, Nelson, BC V1L 5R4.

**RESPONSE SUMMARY**  
**FILE: D2112D APPLICANT: RICHARD KAY**

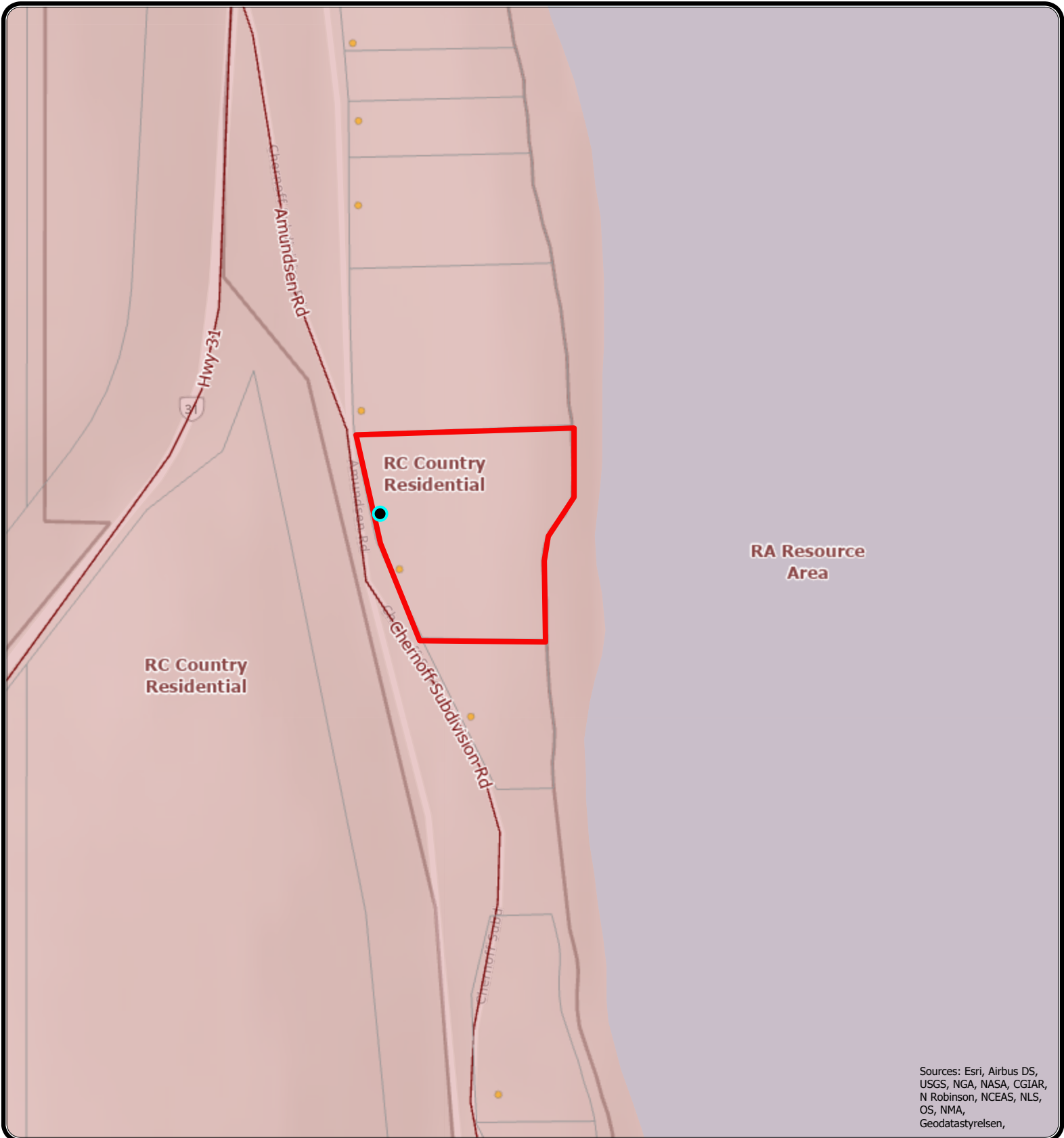
Name:

Date:

Agency :

Title:

RETURN TO:   STEPHANIE JOHNSON, PLANNER  
                  DEVELOPMENT SERVICES  
                  REGIONAL DISTRICT OF CENTRAL KOOTENAY  
                  BOX 590, 202 LAKESIDE DRIVE  
                  NELSON, BC V1L 5R4  
                  Ph. 250-352-8175  
                  Email: [plandept@rdck.bc.ca](mailto:plandept@rdck.bc.ca)



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen,



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**Legend**

-  Official Community Plan
-  Electoral Areas
-  RDCK Roads
-  Cadastre
-  Civic Address

**Map Scale:**

1:4,514

Date: August 9, 2021



The mapping information shown are approximate representations and should only be used for reference purposes. The Regional District of Central Kootenay is not responsible for any errors or omissions on this map.







Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen,



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**Legend**

-  Electoral Areas
-  RDCK Roads
-  Cadastre
-  Civic Address

**Map Scale:**

1:2,257

Date: August 9, 2021



The mapping information shown are approximate representations and should only be used for reference purposes. The Regional District of Central Kootenay is not responsible for any errors or omissions on this map.

## 19.0 DEVELOPMENT PERMIT AREAS

### Background

The OCP may designate Development Permit Areas under the authority of local government legislation. Unless otherwise specified, a development permit must be approved by the Regional Board prior to any development or subdivision of land within a designated Development Permit Area.

Development Permit Areas allow for implementation of special guidelines for the protection of the natural environment, protection from hazardous conditions, for revitalization of designated areas, or to guide the form and character of development within the Kootenay Lake and the Lardeau Valley Plan area. Development Permit Areas can also be used to meet targets for carbon emission reductions and energy and water conservation.

Where land is subject to more than one Development Permit Area designation, a single development permit is required. The application will be subject to the requirements of all applicable Development Permit Areas, and any development permit issued will be in accordance with the guidelines of all such Areas.

### Development Permit Area #1: Watercourse Development Permit (WDP) Area

#### Category

The WDP area is designated under Section 488 (1) (a) of the *Local Government Act* for the protection of the natural environment, its ecosystems and biological diversity.

#### Area

The WDP area is comprised of:

1. Riparian assessment areas (Figure 1) for fish and wildlife habitat and drinking water, which include all watercourses and adjacent land:
  - a. within 30 m of the high water mark of a watercourse;
  - b. within 30 m of the top of the ravine bank in the case of a ravine less than 60 m wide; and
  - c. within 10 m of the top of the ravine bank in the case of a wider ravine that link aquatic to terrestrial ecosystems and includes both existing and potential riparian vegetation and existing and potential upland vegetation that exerts an influence on the watercourse; and as identified in Schedule 'A.1'.

HIGH WATER MARK means the visible high water mark of a watercourse 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 watercourse a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself, and includes the active floodplain;

TOP OF RAVINE BANK means the first significant break in a ravine slope where the break occurs such that the grade beyond the break is greater than 3:1 for a minimum distance of 15 m measured perpendicularly from the break, and the break does not include a bench within the ravine that could be developed;

WATERCOURSE means any natural or man made depression with well-defined banks and a bed 0.6 metres (2.0 feet) or more below the surrounding land serving to give direction to a current of water at least six months of the year and/or having a drainage area of two square kilometres (0.8 square miles) or more upstream of the point of consideration.

### **Justification**

The primary objective of this Development Permit Area designation is to regulate development activities in watercourses and their riparian areas so as to protect aquatic habitat; and to conserve, enhance and, where necessary, restore watercourses and their riparian areas.

The impact of development on watercourses can be minimized by carefully examining the proposed development and taking appropriate measures in relation to the environmentally sensitive riparian area.

### **Determining whether development falls within the WDP Area**

To confirm whether a proposed development is within land identified as a riparian assessment area in the WDP area for which a development permit application is required, the following applies:

2. Any area located within 30 m of the high water mark of a watercourse; within 30 m of the top of the ravine bank in the case of a ravine less than 60 m wide; and within 10 m of the top of the ravine bank in the case of a wider ravine that link aquatic to terrestrial ecosystems and includes both existing and potential riparian vegetation and existing and potential upland vegetation that exerts an influence on the watercourse;
3. Unless the proposed development or alteration of land is clearly outside the riparian assessment area the location of the development shall be determined accurately by survey in relation to the WDP Area to determine whether a development permit application is required.

### **Guidelines**

4. A development permit is required, except where specified under the Exemptions Section, for development or land alteration on land identified as a riparian assessment area within the WDP Area. Where not exempt, development requiring a development permit includes any of the following associated with or resulting from residential, commercial or industrial activities or ancillary activities to the extent that they are subject to local government powers under local government legislation:
  - a. removal, alteration, disruption or destruction of vegetation;
  - b. disturbance of soils;

- c. construction or erection of buildings and structures;
- d. creation of non-structural impervious or semi-impervious surfaces;
- e. flood protection works (with the exception of those constructed during emergency events);
- f. construction of roads, trails, docks, wharves and bridges;
- g. provision and maintenance of sewer and water services;
- h. development of drainage systems;
- i. development of utility corridors; and
- j. subdivision as defined under Section 455 of the *Local Government Act*.

**Development shall be in accordance with the following guidelines:**

- 5. All development proposals subject to this permit will be assessed by a Qualified Environmental Practitioner (QEP) in accordance with the Riparian Areas Regulation established by the Provincial and/or Federal governments as used elsewhere in the Province.
- 6. A WDP shall not be issued prior to the RDCK ensuring that a QEP has submitted a report certifying that they are qualified to carry out the assessment, that the assessment methods have been followed, and provides in their professional opinion that a lesser setback will not negatively affect the functioning of a watercourse or riparian area and that the criteria listed in the Riparian Areas Regulation has been fulfilled.
- 7. The Riparian Areas Regulation implemented through the WDP does not supersede other Federal, Provincial and or local government requirements, including that of other development permit areas, building permits, flood covenants, Federal or Provincial authorization. Land subject to more than one development permit area designation must ensure consistency with the guidelines of each development permit area, to provide comprehensive stewardship of both fish and wildlife habitat.

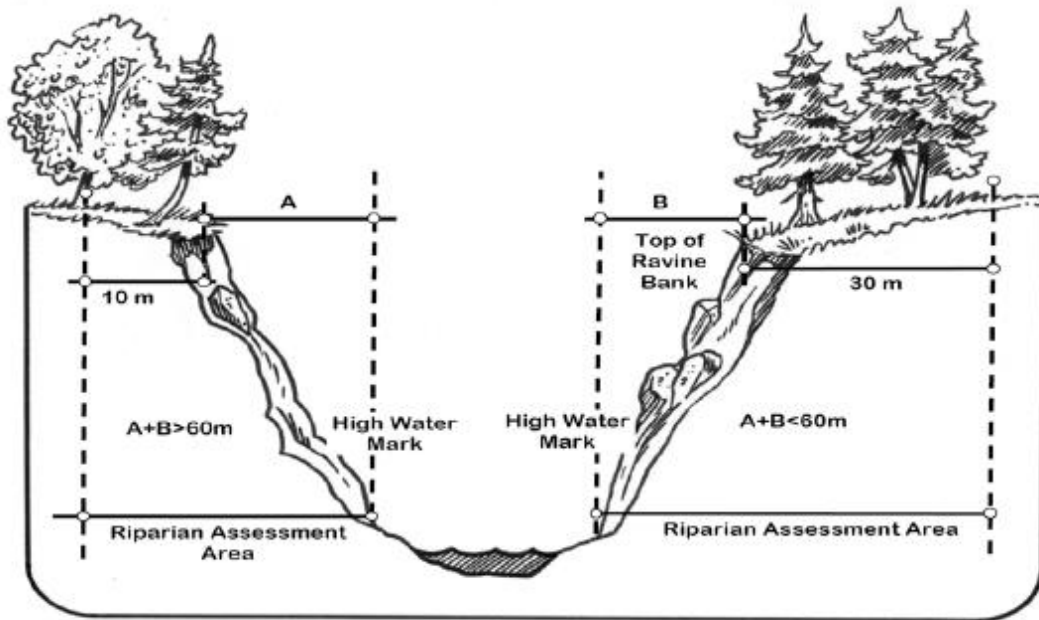
**Exemptions**

The WDP area does not apply to the following:

- 1. existing construction, alteration, addition, repair, demolition and maintenance of farm buildings and agricultural activities including clearing of land for agricultural purposes;
- 2. existing institutional development containing no residential, commercial or industrial aspect;
- 3. construction, renovation, or repair of a permanent structure if the structure remains on its existing foundation. Only if the existing foundation is moved or extended in to a riparian assessment area would a WDP be required; and



- an area where the applicant can demonstrate that the conditions of the WDP Area have already been satisfied or a development permit for the same area has already been issued in the past and the conditions in the development permit have all been met, or the conditions addressed in the previous development permit will not be affected.



**FIGURE 1: RIPARIAN ASSESSMENT AREA:** means the area within 30 m of the high water mark of a watercourse; within 30 m of the top of the ravine bank in the case of a ravine less than 60 m wide; and within 10 m of the top of the ravine bank in the case of a wider ravine that link aquatic to terrestrial ecosystems and includes both existing and potential riparian vegetation and existing and potential upland vegetation that exerts an influence on the watercourse.

Source: British Columbia Ministry of Environment, *Riparian Areas Regulation Implementation Guidebook*, March 2005

## Development Permit Area #2: Industrial Development Permit (IDP) Area

### Category

The IDP area is designated under Section 488 (1) (a) and (f) of the *Local Government Act* for the establishment of objectives for the protection of the natural environment and form and character of industrial uses within the Plan area.

### Area

- The IDP area is comprised of all privately owned or leased lands designated as Industrial (M) on Schedule 'A.1'.

### Justification



5278 AMUNDSEN RD  
MIRROR LAKE, BC

## Riparian Assessment- REVISED



Prepared for:  
Regional District of Central Kootenay  
202 Lakeside Drive,  
Nelson BC, V1L 5R4

Prepared by:  
Masse Environmental Consultants Ltd.  
812 Vernon St.  
Nelson, BC, V1L 4G4

Aug 3, 2021



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Appendix 1. Location Map

Appendix 2. Site and Mitigation Plan

ABBREVIATIONS

AHI: Aquatic Habitat Index

DBH: Diameter at Breast-Height

FIM: Foreshore Inventory Mapping

GSC: Geodetic Survey of Canada

HWM: High Water Mark

LWD: Large Woody Debris

FLNRORD: Forests, Lands and Natural Resource Operations and Rural Development

QEP: Qualified Environmental Professional

RAR: Riparian Area Regulation

RDCK: Regional District of Central Kootenay

ROW: Right of Way

SPEA: Streamside Protection and Enhancement Area

WDP: Watercourse Development Permit

ZOS: Zones of Sensitivity

## 1 INTRODUCTION

Masse Environmental Consultants Ltd. was retained by Dunowen Properties (Owner), to conduct a riparian assessment to accompany an application for a Waterfront Development Permit at 5278 Amundsen Rd (PID 023-195-738). The proposed development includes proposed landscaping within the 30 m watercourse development permit (WDP) area of Kootenay Lake and the relocation of a previously constructed guesthouse from the foreshore to outside of the WDP area. The proposed development is part of the Sentinel Retreat and Wellness Center located on both 5278 and 5308 Amundsen Road. A site survey was conducted on January 18, 2021 and April 16, 2021 by Fiona Lau B.Tech., A.Sc.T.

Previous riparian assessment reports were prepared by Masse for proposed development within the 30 m WDP at 5278 and 5308 Amundsen Road:

- 2021 Riparian Assessment at 5308 Amundsen Rd for proposed Duplex Complexes. DP application currently under review by RDCK (Masse 2021).
- 2017 Riparian Assessment at 5278 Amundsen Rd for the construction of two amenity buildings within the WDP area (Masse 2017). Proposed development and mitigation were approved by the RDCK in 2017. The roundhouse structure was constructed; however, the construction of the proposed yoga building was never completed and is no longer being proposed.

This riparian assessment evaluates the existing conditions of the property and riparian areas, identifies habitat values, assesses potential environmental impacts, and recommends mitigation measures to protect and compensate for the alterations within the riparian area. It is based on the following regulatory framework and best management practices documents:

- Electoral Area 'D' Comprehensive Land Use Bylaw No. 2435, 2016.
- British Columbia *Riparian Areas Regulation*
- Kootenay Lake Shoreline Management Guidelines
- British Columbia *Water Sustainability 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
- British Columbia Firesmart Homeowners Manual
- Riparian Factsheet No. 6 – Riparian Plant Acquisition and Planting
- BC Tree Replacement Criteria
- A Homeowner's Guide to Stormwater Management.

This report has been prepared by Fiona Lau B.Tech., A.Sc.T., and reviewed by Lisa Pavelich, BSc, PAg.

I, Fiona Lau, hereby certify that:

- a) I am a Qualified Environmental Professional (QEP), as defined in Section 21 of the *Riparian Areas Protection Regulation* made under the *Riparian Areas Protection Act*;

- b) I am qualified to carry out the assessment of the proposal made by the Owner (Dunowen Properties), which is described in Section 2.3 of this Assessment Report (the “development proposal”);
- c) I have carried out an 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 specifications of the *Riparian Areas Protection Regulation* and assessment methodology set out in the Minister’s manual.

## 2 PROJECT OVERVIEW

### 2.1 Location

The subject property is located ~7 km south of the community of Kaslo, BC (Appendix 1). The property is bordered by private property to the south (5240 Amundsen), commonly owned property of “The Sentinel” to the north (5308 Amundsen Rd), Ministry of Transportation (MoT) right of way to the west (Amundsen Rd) and Kootenay Lake to the east.

The project area is within the Interior Cedar Hemlock dry warm variant 1 (ICHdw1) biogeoclimatic subzone (MacKillop and Ehman 2016). This moist climatic region is characterized by very hot, moist summers; and very mild winters with light snowfall. Soils generally dry out in late summer for varying extents of time ranging from insignificant to extensive. Snowpacks are very shallow to shallow and of short duration and combined with the mild climate result in no significant soil freezing (MacKillop and Ehman 2016).

### 2.2 Existing Site Conditions

The subject property is partially developed consisting of a guest lodge, multiple outbuildings including the newly constructed Roundhouse (Photo 1), garden areas, driveways, firepit and access paths (Photo 2). The south end of the property remains mostly undeveloped and forested. The foreshore consists of a mixed young forest, exposed bedrock outcrops with a disturbed section in the center of the property used as a firepit and beach area (Photos 5 and 6). The disturbed section of the foreshore was historically used for staging and launching barges (P. communication Richard Kay) and remnants of cables are still evident on the foreshore. A single access road and small forest path exist from the upper bench down to the beach (Photo 2). The existing dock is located south of the firepit.

In the period of 2017-2021, the Owner completed development activities along the foreshore of the property within the WDP area without a development permit. Development activities within the WDP area included:

- Levelling an area on the upper bench for lawn (100 m<sup>2</sup>), which was previously allocated for re-vegetation to mitigate for habitat loss from the Roundhouse construction (Photo 3; Masse 2017);
- Constructing a guesthouse with wrap around deck (~40 m<sup>2</sup>) (Photo 4). The guesthouse currently has plumbing and electricity and is located on a rocky section of foreshore;
- Adding gravel over an existing lawn to create a firepit area (~100 m<sup>2</sup>) (Photo 5);

- Constructing rock retaining walls by hand (< 3' high) along the frontside of the boathouse (Photo 4);
- Installing a boat rack (~4 m<sup>2</sup>); and
- Removing/disturbing riparian vegetation south of the firepit area (~195 m<sup>2</sup>) (Photo 6). Disturbance activities involved cutting, pruning and removal of selective riparian vegetation and removal of large woody debris (LWD) and mosses. It appears that the native soils have been largely left in place and some of the native vegetation is starting to re-establish.

During the site visit, the visible high water mark (HWM) of Kootenay Lake was located at ~533.5 m – 534 m elevation, approximately the natural boundary line as shown on the attached site plan (Appendix 2). The natural boundary was based on the location of presence of terrestrial vegetation along the foreshore (see definition of Natural Boundary below). The riparian setbacks will be measured from the natural boundary line as depicted on the survey.

“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).”



Photo 1. View of Roundhouse located on 5278 and 5308 Amundsen Road.



Photo 2. Access road down to water from upper bench.



Photo 3. New level lawn on upper bench.



Photo 4. New guesthouse along foreshore.





Photo 5. New graveled firepit area on foreshore, April 16, 2021



Photo 6. Removal of riparian vegetation, south of firepit area.

### 2.3 Proposed Development

The proposed development is for approval of the unauthorized works constructed between 2017-2021 and new works including:

- Level lawn area on upper bench (this area was previously disturbed (~100 m<sup>2</sup>));
- Graveled firepit area and rock retaining walls (~40 m<sup>2</sup>);
- Boat rack (~4 m<sup>2</sup>);
- New 1 m wide access path to beach and dock (~24 m<sup>2</sup>); and
- New 0.5 m wide foreshore trail and small seating area (~15 m<sup>2</sup>).
- Relocation of the unauthorized guesthouse (~40 m<sup>2</sup>) to an area outside of the 30 m WDP area, as per the direction of the RDCK. Exact location is still to be determined. The existing footprint of the guesthouse will either become a lawn and/or deck area.

The proposed trails will create dedicated walking paths for guests along the foreshore, which will help prevent trampling and disturbance to riparian vegetation. Trail surfaces will be natural and pervious (ie. earth, gravel or wood chips). Refer to Site Plan for proposed development footprint and locations (Appendix 2).

### 2.4 Services

Sewage disposal for the existing guest lodge and Roundhouse is serviced by an existing septic disposal field located on the west side of the property, outside of the 30 meter setback. Both the Lodge and the Roundhouse is connected to the existing water system which draws water from Kootenay Lake.

The proposed development will not require any servicing.

### 3 REGULATORY REVIEW

#### 3.1 Streamside Protection and Enhancement Area

To determine whether the 30 m WDP setback from the HWM of Kootenay Lake aligns with Riparian Area Protection Regulation (RAPR) criteria, a detailed assessment of the subject property was conducted to calculate the Streamside Protection and Enhancement Area (SPEA) setbacks. Results for the Zones of Sensitivity (ZOS) and SPEA are presented in Table 1, Figure 1 and Appendix 2.

As per the RAPR, the large woody debris (LWD), and litter ZOS were plotted 15 m inland from the HWM of Kootenay Lake. The Shade ZOS was plotted 0 -7 m south of the HWM. The SPEA setback is determined based on the ZOS with the greatest width. Therefore, within the subject property the SPEA is 15 m from the HWM.

The BC Riparian Areas Regulation (BC 2015) defines “High Water Mark” and “Stream” as follows:

“High Water Mark” means the visible high water mark of a stream 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 stream a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself, and includes the active floodplain.”

“Stream” includes any of the following that provides fish habitat:

- (a) a watercourse, whether it usually contains water or not;
- (b) a pond, lake, river, creek or brook;
- (c) a ditch, spring or wetland that is connected by surface flow to something referred to in paragraph (a) or (b).

Table 1. Results of detailed RAPR assessment.

Feature Type	SPVT <sup>1</sup>	Zones of Sensitivity			SPEA
		LWD	Litter fall	Shade	
Kootenay Lake	TR	15 m	15 m	0 -7 m	15 m

<sup>1</sup> SPVT: site potential vegetation type (TR-tree)

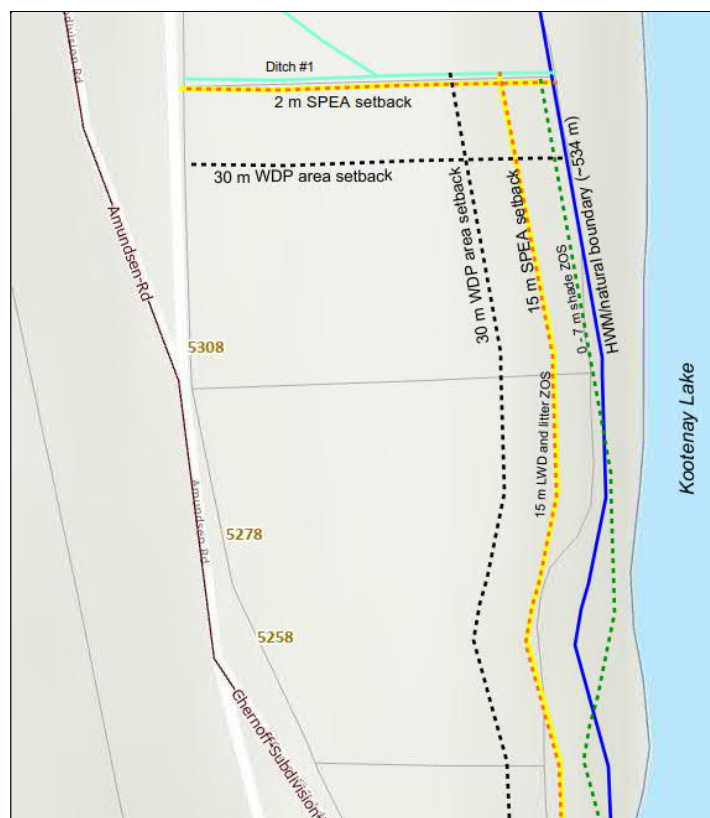


Figure 1. SPEA map.

### 3.2 Kootenay Lake Shoreline Management Guidelines

The Kootenay Lake Foreshore Inventory Mapping (FIM) and the Kootenay Lake Shoreline Management Guidelines documents (EEC 2016, KLP 2018) were used to help determine site specific risks for riparian habitat, Ktunaxa Nation cultural values, and archaeological resources along the shoreline. The property is within FIM segment 71. Table 2 provides the environmental and archaeological risk results identified in the FIM along the shoreline of the property.

Table 2. Environmental and archaeological risk results.

Aquatic Habitat Index Rating (AHI)	Aquatic Sensitivity	Archaeological Risk	Enhanced Engagement Required
Moderate	Yes	Yellow	No

## 4 RESOURCES

### 4.1 Fish and Fish Habitat

The Kootenay Lake foreshore consists of a rocky shoreline with angular boulders and cobble substrate (Photos 7 and 8) and is moderately sloped from 15-30% gradient. The instream habitat provides potential rearing and cover habitat for juvenile and adult fish. No aquatic vegetation was observed within this

segment along the shoreline; however, it has been noted in the FIM mapping as having some submergent vegetation fronting the property (EEC 2016, KLP 2018).

Kootenay Lake supports a variety of fish species, including several species of regional interest, such as Rainbow Trout, Bull Trout, Kokanee, White Sturgeon, Westslope Cutthroat Trout, and Burbot. Mussels were not observed along the foreshore; however, a complete mussel survey was not conducted as part of the site visit, since no inwater works are proposed.



Photo 7. View of angular rock along shoreline.



Photo 8. View of rearing and cover habitat.

#### 4.2 Riparian Vegetation

The riparian area along Kootenay Lake has an eastern aspect (Appendix 2), with large areas of exposed bedrock, well-spaced coniferous and deciduous trees and low growing shrubs (Photos 9 and 10). On the north portion of the property, topography averages ~15% along the water, where a grade break occurs just above the natural boundary and steepens to >80% slope and levels off at around the 15 m setback. Trees and shrubs are sporadic and growing in small, shallow pockets of soil along the rocky slopes.

In the center to south portion of the property topography averages ~5-10% within the 15 m setback and then steepens to ~ 55 % slope. The center portion of the property has been converted from a lawn area to a graveled firepit with spotted knapweed occurring along the edges (Photos 11 and 12). In the south portion of the property, prior to recent riparian disturbance, vegetation consisted of a young conifer forest with dominant understory vegetation containing deciduous shrubs with large open areas of moss and lichen ground cover (Photos 13 and 14). Vegetation changes to a more mature conifer forest, rocky slopes with minimal understory at around the ~20 m setback (Photo 13). Many of the trees within the riparian area may have shallow rooting systems due to the thin soils over rocky terrain and may be susceptible to windthrow.

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



Photo 9. Rocky outcrop at north end of property, May 3, 2017.



Photo 10. View of riparian area in front of same rocky outcrop shown in Photo 9, Jan 18, 2021.



Photo 11. Previous lawn where graveled firepit now is sited, May 3, 2017.



Photo 12. View of new graveled firepit area, April 16, 2021.



Photo 13. View of riparian area on lower bench prior to vegetation removal., May 3, 2017.



Photo 14. View of riparian area as seen in Photo 11, post vegetation removal, April 16, 2021.

Table 3. Plant species encountered on the property.

Species Name	Latin Name	Species Name	Latin Name
<i>Trees</i>		<i>Shrubs cont.</i>	
Interior Douglas fir	<i>Pseudotsuga menziesii</i>	Sitka Mountain ash	<i>Sorbus sitchensis</i>
Western red cedar	<i>Thuja plicata</i>	Soopolallie	<i>Shepherdia canadensis</i>
Lodgepole pine	<i>Pinus contorta</i>	Thimbleberry	<i>Rubus parviflorus</i>
Black cottonwood	<i>Populus trichocarpa</i>	Douglas maple	<i>Acer glabrum</i>
Paper birch	<i>Betula papyrifera</i>	<i>Herbaceous</i>	
<i>Shrubs</i>		Licorice fern	<i>Polypodium glycyrrhiza</i>
Rose sp.	<i>Rosa sp.</i>	Queen's cup	<i>Clintonia uniflora</i>
Red osier dogwood	<i>Cornus stolonifera</i>	Pasture sage	<i>Artemisia frigida</i>
Oregon grape	<i>Mahonia aquifolium</i>	Wild strawberry	<i>Fragaria virginiana</i>
Common snowberry	<i>Symphoricarpos albus</i>	Spotted knapweed	<i>Centaurea biebersteinnii</i>
Black hawthorn	<i>Crataegus douglasii</i>	Grasses sp.; mosses sp.; and lichens sp.	

#### 4.2.1 Reptiles and Amphibians

The rocky outcrops and abundant cover provided by rocks and large woody debris (LWD) provide potential habitat for reptiles and amphibians; however, presence of these species on site was not confirmed during the site visit. LWD removed from the riparian area has limited the amount of cover habitat for reptiles in the south portion of the property.

#### 4.2.2 Birds

Both conifer and deciduous trees provide habitat for species including cavity dwellers, songbirds and raptors. Mature trees within the riparian area provide perch and potential nesting sites for raptors although no nests were observed during the site assessment.

#### 4.2.3 Mammals

Riparian areas provide suitable habitat for mammals. Ungulates and bears utilize the area to browse on palatable vegetation. Deer droppings were observed within the property during the site visit.

#### 4.3 Species at Risk

A 10 km buffer around the subject property was used to query BC Conservation Data Center records using the [CDC iMap](#) tool. Based on this query, three species at risk occurrences are known within the 10 km of the project area:

- 1) The Upper Kootenay River white sturgeon (*Acipenser transmontanus*) population- Red listed. Critical Habitat for white sturgeon on Kootenay Lake is located at the Crawford Creek delta on the east shore of Kootenay Lake ~ 33 km away and at the Duncan delta at the north end of Kootenay Lake ~ 28 m away (Environment Canada 2014).

- 2) Painted turtle (*Chrysemys picta*)- Blue listed. The nearest observation of painted turtle was in Mirror Lake, approximately 2.5 km away. The subject property does not provide suitable turtle habitat.
- 3) Wild licorice (*Glycyrrhiza lepidota*)- Blue listed. The nearest observation of wild licorice was at Mirror lake, approximately 2.5 km away.

#### 4.4 Archaeological Resources

Kootenay Lake is part of the traditional territory of the Sinixt, Okanagan and Ktunaxa First Nations and archaeological evidence is documented at multiple shoreline sites. A review of archaeological resources on this property is outside the scope of this report.

### 5 IMPACT ASSESSMENT

The project footprint includes a previously constructed lawn area (~100m<sup>2</sup>), firepit area (~40 m<sup>2</sup>), boat rack (~4 m<sup>2</sup>), walking paths (~40 m<sup>2</sup>), and lawn/deck area (~40 m<sup>2</sup>); totaling 224 m<sup>2</sup> located within the 30 m WDP area, with ~124 m<sup>2</sup> located within the 15 m SPEA. The permanent removal of riparian vegetation within the SPEA decreases riparian vegetation function which maintains the health and productivity of aquatic ecosystems. This includes future loss of large woody debris recruitment, shade potential, water temperature regulation and nutrient input including litter fall and insect drop.

In addition, the removal of riparian vegetation and increased human activity within the riparian area reduces wildlife habitat for birds, mammals, reptiles and amphibians, increases noise and light disturbance to local wildlife, increases sediment and erosion potential, and stormwater runoff.

Provided that measures to protect the SPEA are followed and the recommended mitigation plan is implemented, negative wildlife and riparian impacts from the development will be minimized.

### 6 MEASURES TO PROTECT THE INTEGRITY OF SPEA

This section provides measures to protect the integrity of the SPEA as described in RAPR, as well as recommended best management practices.

#### 6.1 Danger Trees

A RPF was not retained to assess danger trees as part of this assessment; however, a quick assessment for potential danger trees was conducted by the QEP within the property and no danger trees were identified. The Owner retained a Firesmart specialist last year and had at risk trees identified and cut down.

#### 6.2 Windthrow

A Registered Professional Forester (RPF) was not retained to assess potential windthrow. Clearing activities within the development footprint may increase the risk of windthrow on the property.

### 6.3 Slope Stability

Assessment of geotechnical hazard is beyond the scope of this report, and any such assessment should be led by a P.Geol, or P.Eng. No hazard indicators were observed during the site visit.

### 6.4 Protection of Trees and Vegetation in the SPEA

Protection of trees and other vegetation in the SPEA can be achieved by implementing the following measures:

- Proposed access paths shall be clearly marked prior to construction to prevent further disturbance to riparian vegetation.
- No pollutants should be allowed to contaminate the soil within the development area next to the SPEA.
- Ensure that machinery and equipment used to relocate the guesthouse limits disturbance to native vegetation. Any disturbance shall be restored with native plants and grasses.
- Install signs at head of new pathways stating, "*Restoration in process- Stay on trails*".

### 6.5 Encroachment

The proposed development encroaches within the SPEA. To mitigate for the permanent loss of habitat, re-vegetation is proposed (Section 7.1) within other disturbed areas of the SPEA.

Future encroachment within the SPEA of Kootenay Lake is discouraged to preserve the function of the riparian vegetation and to help maintain bank stability. Any future development (i.e., structures, landscaping, vegetation tree removal) proposed within the SPEA will require a QEP review and a RDCK Watercourse Development Permit.

### 6.6 Sediment and Erosion Control

The following mitigation measures should be implemented to reduce the risk of sediment input to Kootenay Lake:

- Amount of soil disturbance should be kept to a minimum.
- Disturbed soils should be revegetated as soon as possible.

### 6.7 Stormwater Management

The proposed development is not expected to result in an increase of surface water run-off. The following mitigation measures will help decrease stormwater impacts:

- Any new paths shall be pervious (i.e., earth, gravel or wood chips).

### 6.8 Floodplain Concerns

There were no floodplain concerns observed on the subject property.



### 6.9 Scheduling of Environmentally Sensitive Activities

Scheduling of environmentally sensitive activities is not applicable since clearing activities are not proposed.

### 6.10 Protection of Fish Habitat

Development of the property should protect fish habitat by adhering to sediment, stormwater, and waste management best practices outlined in this report to ensure that there is no release of deleterious materials into Kootenay Lake.

### 6.11 Management of Equipment and Fuel/Lubricant Materials

The most likely source of any contaminant is from equipment or vehicles (cranes, tractors and/or bobcats) used or stored on-site during guesthouse relocation and landscaping activities, either during fueling or from unanticipated leaks or the failure of a hydraulic hose. To minimize the likelihood and impact of a spill within the riparian area, ensure that:

- Each piece of equipment will be equipped with its own spill response kit.
- All staff will be familiar with the use of spill kits and their contents. The contents of the kits will be replaced immediately after use.
- Equipment will be stored in a designated area > 30 m from Kootenay Lake.

### 6.12 Invasive Plant Management

Construction activities can potentially increase prevalence of invasive plant species which can out-compete native riparian vegetation, causing damage to habitat and ecosystem function. The following mitigation measures are recommended to reduce the establishment and spread of invasive plant species on site:

- All equipment should be thoroughly washed and inspected before entering the project site to prevent the import of new invasive plant seeds and root fragments.
- All exposed soils should be re-vegetated immediately following construction.
- Spotted knapweed located within the SPEA of Kootenay Lake should be removed by mechanical means such as hand pulling.

## 7 MITIGATION PLAN

The Shoreline Management Guidelines for Kootenay Lake outline general principles for shoreline development in order to achieve a “No Net Loss” of habitats present. The principle is achieved by applying the following priority sequence of mitigation options: 1. *Avoidance* of environmental impacts; 2. *Minimization* of unavoidable impacts; 3. On-site *restoration*; and 4. *Offset* residual impacts that cannot be minimized through compensation (KLP 2018). Avoidance was not achievable with the proposed development as most of the disturbance has already occurred; therefore, mitigation measures to minimize permanent impacts to the riparian area are recommended as described in the following sections. Refer to Appendix 2 for mitigation site plan.

A total area of ~265 m<sup>2</sup> will be restored and/or enhanced through revegetation to help mitigate for the unauthorized and proposed activities within the SPEA:

- Firepit area (~40 m<sup>2</sup>);
- Construction of a boat rack (~4m<sup>2</sup>);
- Riparian vegetation disturbance and removal (~195 m<sup>2</sup>); and
- New walking paths (40 m<sup>2</sup>).

The proposed re-vegetation plan has incorporated the re-vegetation requirement for the Roundhouse construction within the 15 m SPEA of 5278 Amundsen Road, as per the 2017 development permit.

### 7.1 Revegetation

The proposed revegetation plan is designed with a focus on naturalizing disturbed areas within the 15 m SPEA. The vegetation prescription includes planting a combination of native potted stock, plugs and a specifically formulated seed blend to promote tree and shrub habitat establishment. The recommended plant species list is provided in Table 4. The revegetated areas, totalling ~305 m<sup>2</sup>, will require ongoing maintenance (i.e. irrigation and weeding), until they become established over the moderate to long term. In addition, to protect the revegetation areas, signs will be installed at the head of the new pathways stating "*Restoration in Process- Stay on trails*".

As part of the proposed development, revegetation of disturbed areas will include:

#### *Area 1 and Area 2 (Perimeter of firepit circle):*

- Revegetate an area of ~35 m<sup>2</sup>, around the perimeter of the firepit circle and foreshore (Refer to Site Plan, Appendix 2).
- Plant a minimum of 20 native shrubs potted stock (1 and 2 gallon pot size) within Area 1.
- Plant a minimum of 30 native grasses and flowers potted stock (4" and 1 gallon) within Area 2.
- Import topsoil for growing medium, as required.

#### *Area 3 (Disturbed habitat in south portion of property and guesthouse removal area):*

- Restore disturbed habitat by re-vegetating an area of ~270 m<sup>2</sup> (Refer to Planting Area 3 on Site Plan, Appendix 2).
- Plant 50 native tree and shrub potted stock (1 gallon) and 200 native tree and shrub plugs. Focus planting to existing soil pockets within the SPEA.
- Import topsoil for growing medium, as required.
- Re-seed disturbed soil areas with native riparian seed blend, specially formulated for riparian area application (Table 5).

#### *General Planting and Maintenance Guidelines*

- Planting should not occur during periods of hot dry weather unless they are irrigated daily.

- Locally adapted native plants are preferable to those collected or grown outside the region. The species listed in Table 4 are available from Sagebrush Nursery in Oliver <https://sagebrushnursery.com> , or Tipi Mountain Native Plants <http://tmnp.tipimountain.com/> near Kimberley. The native seed mix is available from Interior Seed & Fertilizer <https://interiorseedandfertilizer.ca>.
- Trees should be planted at minimum 3 m spacing, shrubs planted at minimum of 1 m spacing.
- Planting holes shall be a minimum of 3 times the size of the pot and backfilled with a 50/50 mix of growing medium and native soil.
- Apply transplant fertilizer (ie. Mykes Mycorrhizae Tree and Shrub or similar) as per manufacturers specifications in each planting hole.
- Bark mulch should be placed around each of the larger planted stock to help retain soil moisture and reduce weeds and watering requirements.
- Plantings which do not survive should be replaced to ensure complete establishment of native plants, and exclusion of exotic plants.
- Ensure the objective of the restoration is to naturalize the riparian area and not create a landscaped garden.
- Regularly irrigate new plantings during the plant establishment period for a minimum of 3 years and thereafter as required.
- Pull invasive weeds on a monthly basis during the growing season prior to seed set.
- Planting around buildings should adhere to principles of rural residential fire protection (for more information see the [FireSmart Homeowner's Manual](#) (MFLNRO N.D)).

Table 4. Recommended plant species.

Species	Scientific Name	Species	Scientific Name
<i>Trees</i>		<i>Shrubs cont.</i>	
Interior Douglas fir	<i>Pseudotsuga menziesii</i>	red flowering currant	<i>Ribes sanguineum</i>
paper birch	<i>Betula papyrifera</i>	red osier dogwood	<i>Cornus stolonifera</i>
ponderosa pine	<i>Pinus ponderosa</i>	Saskatoon berry	<i>Amelanchier alnifolia</i>
Western larch	<i>Larix occidentalis</i>	scoulers willow or sitka willow	<i>Salix scouleriana and/or Salix sitchensis</i>
Western red cedar	<i>Thuja plicata</i>	Soopolallie	<i>Shepherdia canadensis</i>
Western white pine	<i>Pinus monticola</i>	<i>Grasses and flowers</i>	
<i>Shrubs</i>		anise hyssop	<i>Agastache rugosa</i>
beaked hazelnut	<i>Corylus cornuta</i>	bluebunch wheatgrass	<i>Pseudogenaria spicata</i>
blue elderberry	<i>Sambucus caerulea</i>	blue wild rye	<i>Elymus glaucus ssp.</i>
common juniper	<i>Juniperus communis</i>	junegrass	<i>Koeleria macrantha</i>
Douglas maple	<i>Acer glabrum</i>	pinegrass	<i>Calamagrostis rubescens</i>
thimbleberry	<i>Rubus parviflorus</i>	tufted hairgrass	<i>Deschampsia sp.</i>
kinnikinnick	<i>Arctostaphylos uva-ursi</i>	lance leaved stonecrop	<i>Sedum lanceolatum</i>
mallow ninebark	<i>Physiocarpus malvaceus</i>	golden rod	<i>Solidago canadensis</i>
mountain or sitka alder	<i>Alnus incana or crispa</i>	junegrass	<i>Koeleria macrantha</i>
native rose	<i>Rosa sp.</i>	nodding onion	<i>Allium cernuum</i>
ocean spray	<i>Holodiscus discolor</i>	yarrow	<i>Achillea millefolium</i>
oregon grape	<i>Mahonia aquifolium</i>	silky lupine	<i>Lupinus sericeus</i>

Table 5. Recommended seed mix blend

Native Riparian Blend 1	% weight	% by species
slender wheatgrass	25.0%	18%
streambank wheatgrass	25.0%	18%
fringed brome grass	24.7%	9%
northern wheatgrass	20.0%	14%
sheep fescue	3.0 %	10%
tufted hairgrass	1.0 %	11%
fowl bluegrass	1.0 %	9%
yarrow	0.3 %	3%

## 8 ENVIRONMENTAL MONITORING

The anticipated effort for environmental monitoring and professional guidance on this project includes the following:

- QEP may be required by the RDCK to conduct a post construction site visit once revegetation is complete to assess compliance and completion of the project.
- QEP may be required by the RDCK to prepare an environmental summary report.

## 9 CONCLUSION

Overall, the mitigation plan as proposed will help mitigate some of the environmental impacts caused by unauthorized and proposed activities within the SPEA. The proposed development within the SPEA has caused loss and disturbance of riparian habitat; however, as the restoration areas become established with native species, the riparian function will be partially restored along the foreshore. If you have any comments or questions, please do not hesitate to contact the undersigned. Any future development (i.e., structures, landscaping, vegetation removal) proposed within the SPEA will require a QEP review and an amendment to the RDCK Watercourse Development Permit. If you have any comments or questions, please do not hesitate to contact the undersigned.

## 10 CLOSURE

This report has been prepared by a QEP who has not acted for, or as an agent(s) of the RDCK and was at the expense of the property owner.

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.

Sincerely,



Fiona Lau, ASCT, BTech.

[fiona@masseenvironmental.com](mailto:fiona@masseenvironmental.com)

Reviewed by:



Lisa Pavelich, P.Ag, BSc.

Masse Environmental Consultants

## 11 REFERENCES

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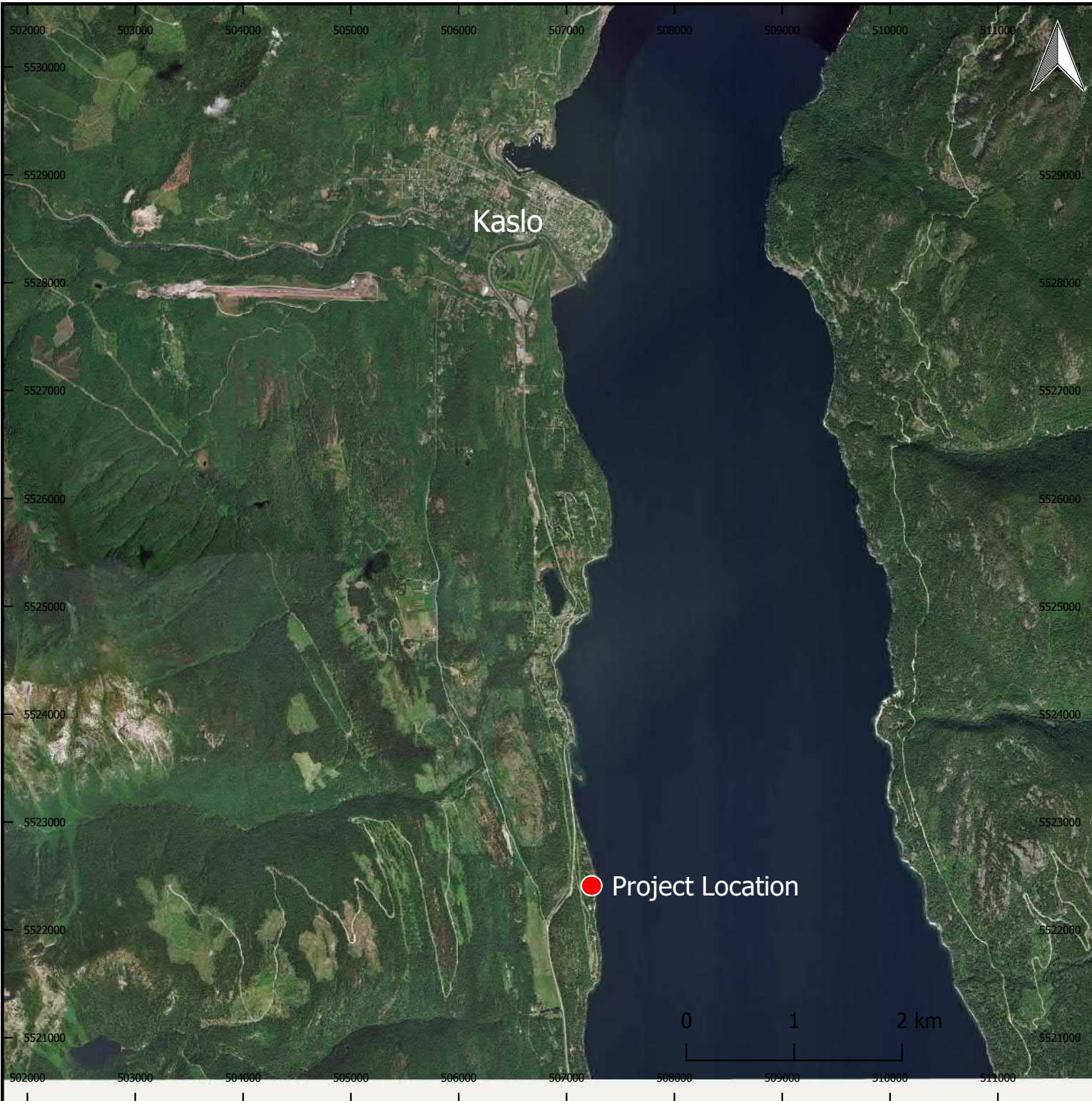
[MFLNRO] BC Ministry of Forests Lands and Natural Resource Operations. N.D. Firesmart Homeowner's Manual.

[RDCK] Regional District of Central Kootenays. 2016. Electoral Area 'D' Comprehensive Land Use Bylaw No. 2435, 2016.

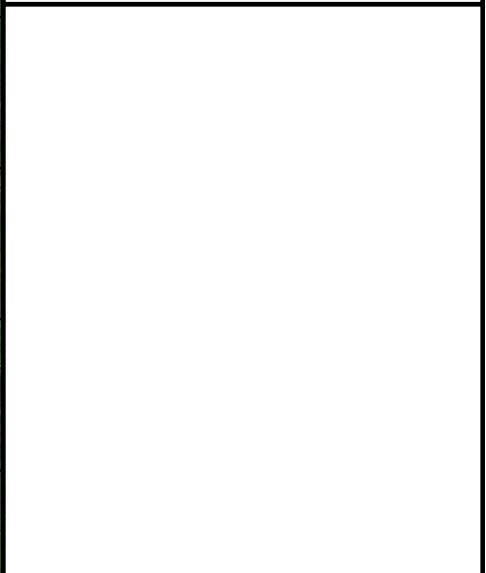
[RDCK] Regional District of Central Kootenays. 2009. Regional District of Central Kootenay Floodplain Management Bylaw No. 2080, 2009.

APPENDIX 1  
LOCATION MAP



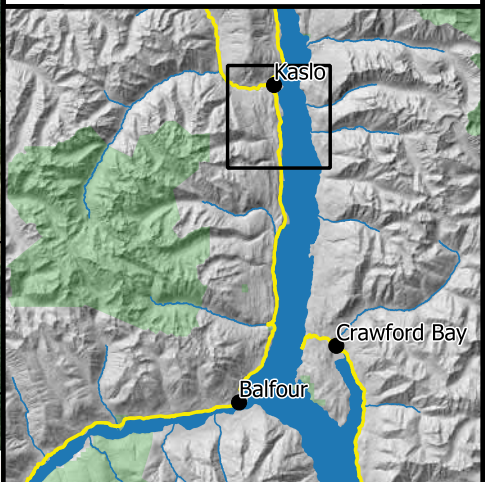


# 5278 Amundsen Rd. Project Location



1:50000

1/21/2021



● Project Location



APPENDIX 2  
SITE AND MITIGATION PLAN

SKETCH PLAN TO ACCOMPANY ACCRETION APPLICATION FOR LOT 1 DL 7386 KD PLAN NEP22516.

Scale 1:400



LEGEND

Dimensions derived from Plan 11474.  
All dimensions are in metric.  
Elevations are geodetic and derived from BM 497792.

Address - 5278 Amundsen road

- Standard iron post found
- + Flag or stake
- Ⓣ Photograph location, direction
- 511.1 Spot elevation
- 926 Point number on flag or stake

LEGEND

**Proposed Development (224 m<sup>2</sup> within 30 m WDP area and 123 m<sup>2</sup> within 15m SPEA)**

- Existing and currently unauthorized (lawn, firepit area, boat rack)
- New (walking paths and lawn/deck area)

**Re-vegetation Plan (265 m<sup>2</sup>)**

- Area 1** ( 20 m<sup>2</sup>): Plant 20 native shrubs (1 gallon pot size).
- Area 2** ( 15 m<sup>2</sup>): Plant 30 native grasses and flowers ( 1 gallon pot size).
- Area 3** (230 m<sup>2</sup>): 40 native trees and shrubs (1 gallon) and 200 native plant plugs

