REGIONAL DISTRICT OF CENTRAL KOOTENAY

DEVELOPMENT PERMIT

DP2112D (The Sentinel c/o 52785308 AMUNDSEN ENTERPRISES)

Date: September 20, 2021

Issued pursuant to Sections 490 and 491 of the Local Government Act

1. This Development Permit is issued to 52785308 AMUNDSEN ENTERPRISES of Vancouver, BC as the registered owner (hereinafter called the "Permittee") and shall only apply to those lands within the Regional District of Central Kootenay, in the Province of British Columbia legally described as Lot 1 Plan NEP22516 District Lot 7386 Kootenay Land District (PID: 023-195-738) as shown on the attached Schedules 1 and 2, 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 Country Residential (RC) and are located within a 'Watercourse Development Permit Area' pursuant to the *Electoral Area 'D' Comprehensive Land Use Bylaw No. 2435, 2016* as amended.

5. The Permittee has applied to the Regional District of Central Kootenay to construct a new access path to the beach and dock, and a new foreshore trail and seating area, and relocation of the existing unauthorized guesthouse to outside of the 30 metre Watercourse Development Permit Area on the said lands. 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 this purpose.

6. The Permittee is required to obtain approval in writing from the Regional District of Central Kootenay prior to any further disturbance, construction any new buildings, external additions to existing buildings or for any deviation from the development authorized under Schedules 2 and 3 of this Development Permit. Furthermore, the Permittee is hereby advised of the following requirements:

   6.1 The Regional District of Central Kootenay Building Department requires that the Permittee 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.

   6.2 Development is authorized in accordance with the terms described in the report titled *"5278 Amundsen Road, Mirror Lake, BC - Riparian Assessment - Revised"* prepared by Masse Environmental Consultants Ltd., dated August 3, 2021, and attached to this permit as Schedule 3. Conditions of the report can be categorized as follows:

6.2.1 Measures to protect the integrity of the Streamside Protection and Enhancement Area (SPEA). This includes the protection of trees and other vegetation within the SPEA, sediment and erosion control, storm water management, protection of fish habitat, scheduling of environmentally sensitive activities, construction waste management, management of equipment and fuel/lubricant materials and management of invasive plants. All work shall be done in accordance with Section 6 of the attached report (Schedule 3). Notably, the following conditions shall be adhered to:

6.2.1.1 Staging and access should only occur in previously disturbed areas of the site;

6.2.1.2 The SPEA should be clearly marked prior to construction to protect vegetation and root systems within the SPEA. Snow fencing shall be installed along the 15 metre setback from Kootenay Lake or top of embankment and shall remain in place through the duration of construction;

6.2.1.3 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 relocation 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”.

6.2.1.4 The proposed development encroaches within the SPEA. To mitigate for permanent loss of habitat, revegetation is proposed within other disturbed areas of the SPEA. Further 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. structure, landscaping, vegetation, tree removal) proposed within the SEPA will require a QEP review and a RDCK Watercourse Development Permit.

6.2.1.5 To reduce the risk of sediment input to Kootenay Lake soil disturbance should be kept to a minimum. Disturbed soils should be revegetated as soon as possible after construction.

6.2.1.6 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).

6.2.1.7 To minimize the likelihood and impact of a spill of fuel/lubricant materials within the riparian area, ensure that: each piece of heavy equipment will be have its own spill response kit; all staff will be familiar with the use of spill kits and their contents; and equipment shall be stored in a designated area greater than 30 metres from Kootenay Lake.

6.2.1.8 To reduce the establishment and proliferation of invasive plan 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; amount of vegetation clearing, and soil disturbance should be minimized; all exposed soils should be re-vegetated immediately following construction; and hand-pulling of spotted knapweed located within the SPEA of Kootenay.

6.3 The proposed development shown in Schedule 2 does encroach within the SPEA. To mitigate for the unauthorized and proposed activities within the SPEA a 265 m^2 area will be restored and or enhanced through revegetation in accordance with Section 7 – Mitigation Plan and Revegetation attached as Schedule 3 shall be implemented. Landscaping shall be completed once the construction is complete. Plant species and seed mix blend shall be in accordance with Table 4 of Schedule 3.

6.4 A building permit shall be required prior to any construction involving land in this location at which time the Permittee shall be required to address sewage disposal issues to the satisfaction of the Interior Health Authority and Regional District of Central Kootenay Senior Building Official.

7. As a condition of the issuance of this Permit, the Regional District shall hold an irrevocable Letter of Credit submitted by the Permittee in the amount of $4, 245.25 to ensure the landscaping requirements as set forth in Section 7 are completed and in accordance with the following provisions:

7.1 A condition of the posting of the Letter of Credit is that should the Permittee 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.

7.2 The Permittee shall complete the landscaping works required by this Permit prior to September 20, 2023. Within this time period the required landscaping must be inspected and approved by the Regional District.

7.3 If the landscaping is not approved 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.

7.4 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.

7.5 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.

8. 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.

9. 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.

10. 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.

11. 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.

12. 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.

13. This Development Permit does not constitute a building permit.

14. 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.

S Sudan

Sangita Sudan, General Manager of Development Services

October 21, 2021

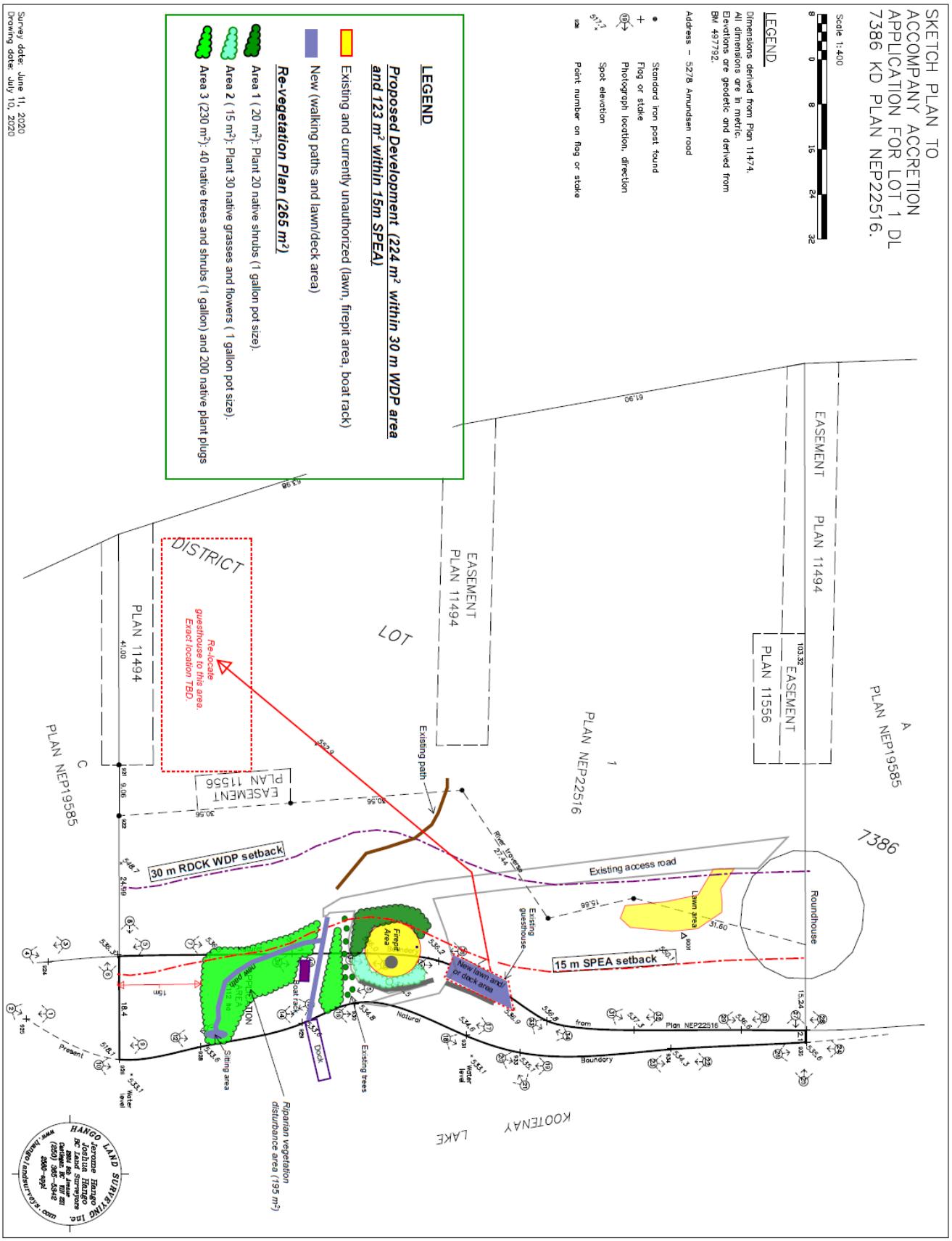
Date of Approval

September 8, 2022

Date of Issuance

Schedule 1: Location Map

Schedule 2: Site Plan



Schedule 3: Riparian Assessment - Revised, dated August 3, 2021 by Masse Environmental Consultants Ltd. for 5278 Amundsen Road

MASSE ENVIRONMENTAL
CONSULTANTS LTD.

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^2), 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^2) (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^2) (Photo 5);

- Constructing rock retaining walls by hand (< 3' high) along the frontside of the boathouse (Photo 4);
- Installing a boat rack (~4 m^2); and
- Removing/disturbing riparian vegetation south of the firepit area (~195 m^2) (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^2));
- Graveled firepit area and rock retaining walls (~40 m^2);
- Boat rack (~4 m^2);
- **New** 1 m wide access path to beach and dock (~24 m^2); and
- **New** 0.5 m wide foreshore trail and small seating area (~15 m^2).
- **Relocation** of the unauthorized guesthouse (~40 m^2) 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[1]	Zones of Sensitivity			SPEA
		LWD	Litter fall	Shade	
Kootenay Lake	TR	15 m	15 m	0 -7 m	**15 m**

[1] SPVT: site potential vegetation type (TR-tree)

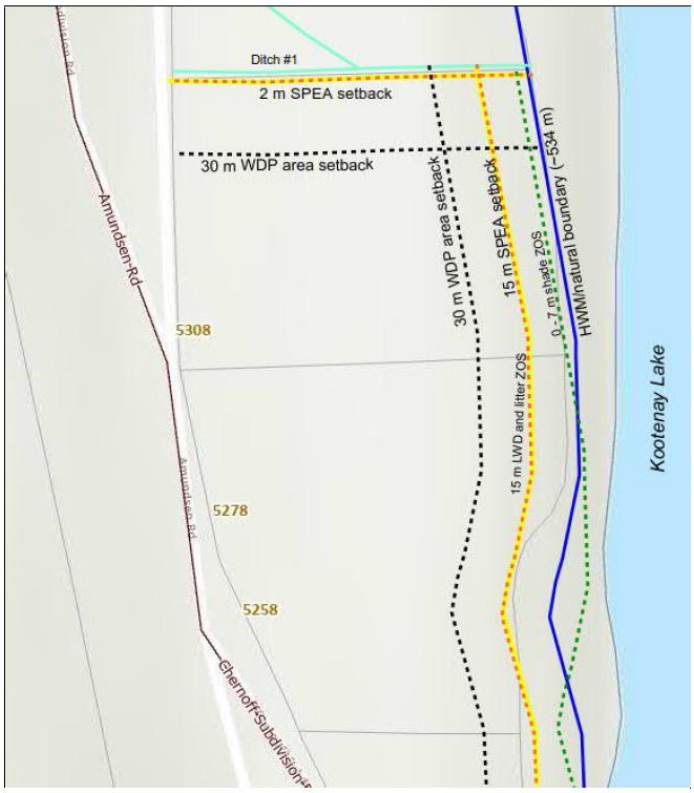

Figure 1. SPEA map.

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
Trees		***Shrubs cont.***	
Interior Douglas fir	*Pseudotsuga menziesii*	Sitka Mountain ash	*Sorbus sitchensis*
Western red cedar	*Thuja plicata*	Soopolallie	*Shepherdia canadensis*
Lodgepole pine	*Pinus contorta*	Thimbleberry	*Rubus parviflorus*
Black cottonwood	*Populus trichocarpa*	Douglas maple	*Acer glabrum*
Paper birch	*Betula payrifera*	***Herbaceous***	
Shrubs		Licorice fern	*Polypodium glycyrrhiza*
Rose sp.	*Rosa sp.*	Queen's cup	*Clintonia uniflora*
Red osier dogwood	*Cornus stolinifera*	Pasture sage	*Artemisia frigida*
Oregon grape	*Mahonia aquifolium*	Wild strawberry	*Fragaria virginiana*
Common snowberry	*Symphoricarpos albus*	Spotted knapweed	*Centaurea biebersteinnii*
Black hawthorn	*Crataegus douglasii*	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^2), firepit area (~40 m^2), boat rack (~4 m^2),walking paths (~40 m^2), and lawn/deck area (~40 m^2); totaling 224 m^2 located within the 30 m WDP area, with ~124 m^2 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.Geo, 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 a 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^2 will be restored and/or enhanced through revegetation to help mitigate for the unauthorized and proposed activities within the SPEA:

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

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^2, 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^2, 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^2 (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
Trees		***Shrubs cont.***	
Interior Douglas fir	*Pseudotsuga menziesii*	red flowing currant	*Ribes sanguineum*
paper birch	*Betula papryfera*	red osier dogwood	*Cornus stolonifera*
ponderosa pine	*Pinus ponderosa*	Saskatoon berry	*Amelanchier alnifolia*
Western larch	*Larix occidentalis*	scoulers willow or sitka willow	*Salix scouleriana and/or Salix sittchensis*
Western red cedar	*Thuja plicata*	Soopolallie	*Shepherdia canadensis*
Western white pine	*Pinus monticola*	***Grasses and flowers***	
Shrubs		anise hyssop	*Agastache rugosa*
beaked hazelnut	*Corylus cornuta*	bluebunch wheatgrass	*Pseudogenaria spicata*
blue elderberry	*Sambucus caerulea*	blue wild rye	*Elymus glaucus ssp.*
common juniper	*Juniperus communis*	junegrass	*Koeleria macrantha*
Douglas maple	*Acer glabrum*	pinegrass	*Calamagrostis rubescens*
thimbleberry	*Rubus parviflorus*	tufted hairgrass	*Deschampsia sp.*
kinnikinnick	*Arctostaphylos uva-ursi*	lance leaved stonecrop	*Sedum lanceolatum*
mallow ninebark	*Physiocarpos malvaceus*	golden rod	*Solidago canadensis*
mountain or sitka alder	*Alnus incana or crispa*	junegrass	*Koeleria macrantha*
native rose	*Rosa sp.*	nodding onion	*Allium cernuum*
ocean spray	*Holodiscus discolor*	yarrow	*Achillea millefolium*
oregon grape	*Mahonia aquifolium*	silky lupine	*Lupinus sericeus*

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

Reviewed by:

Lisa Pavelich, P.Ag, BSc.
Masse Environmental Consultants

11 REFERENCES

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[MEC] Masse Environmental Consultants Ltd. 2017. 5278 Amundsen Road Riparian Assessment Report. Prepared for the RDCK.

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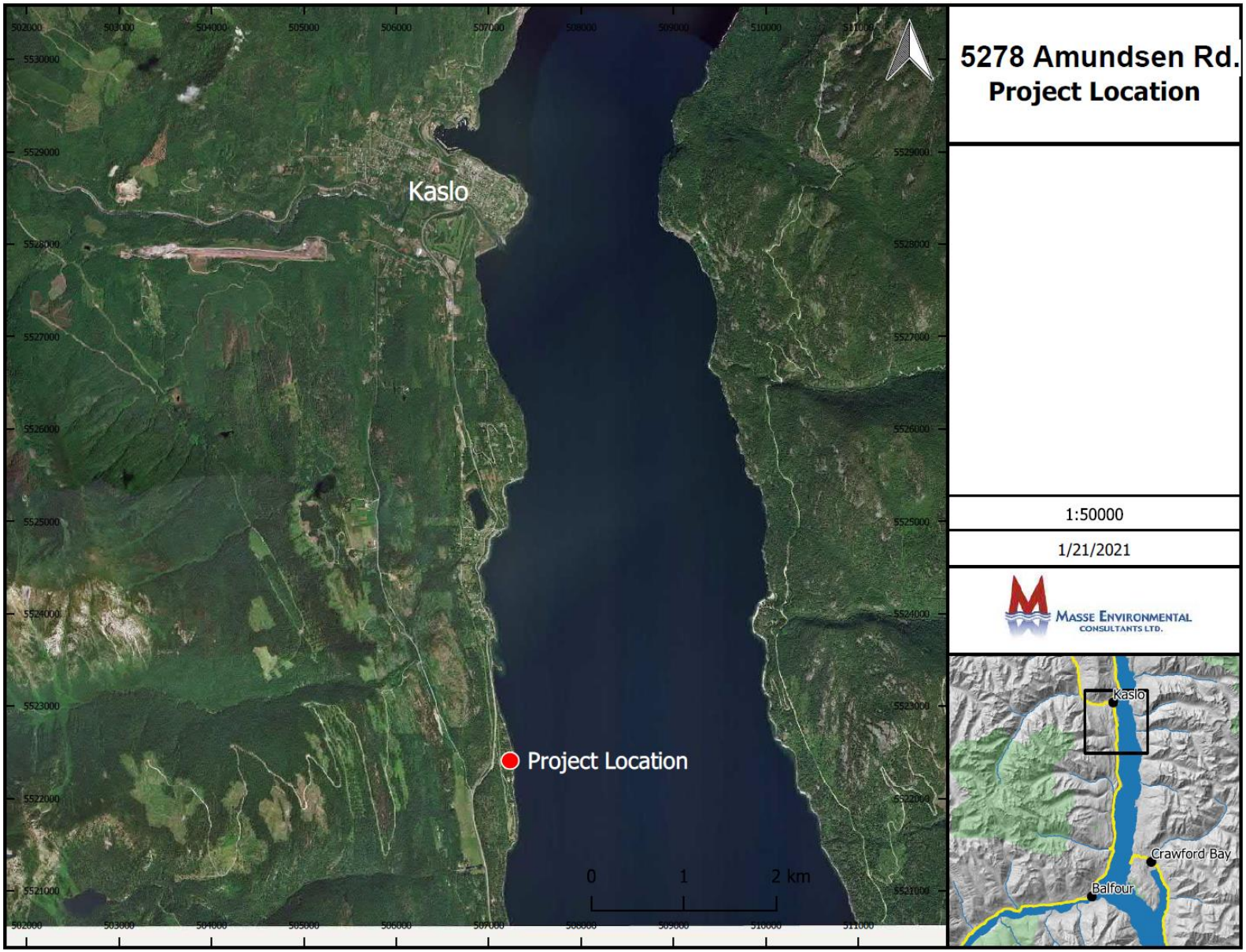
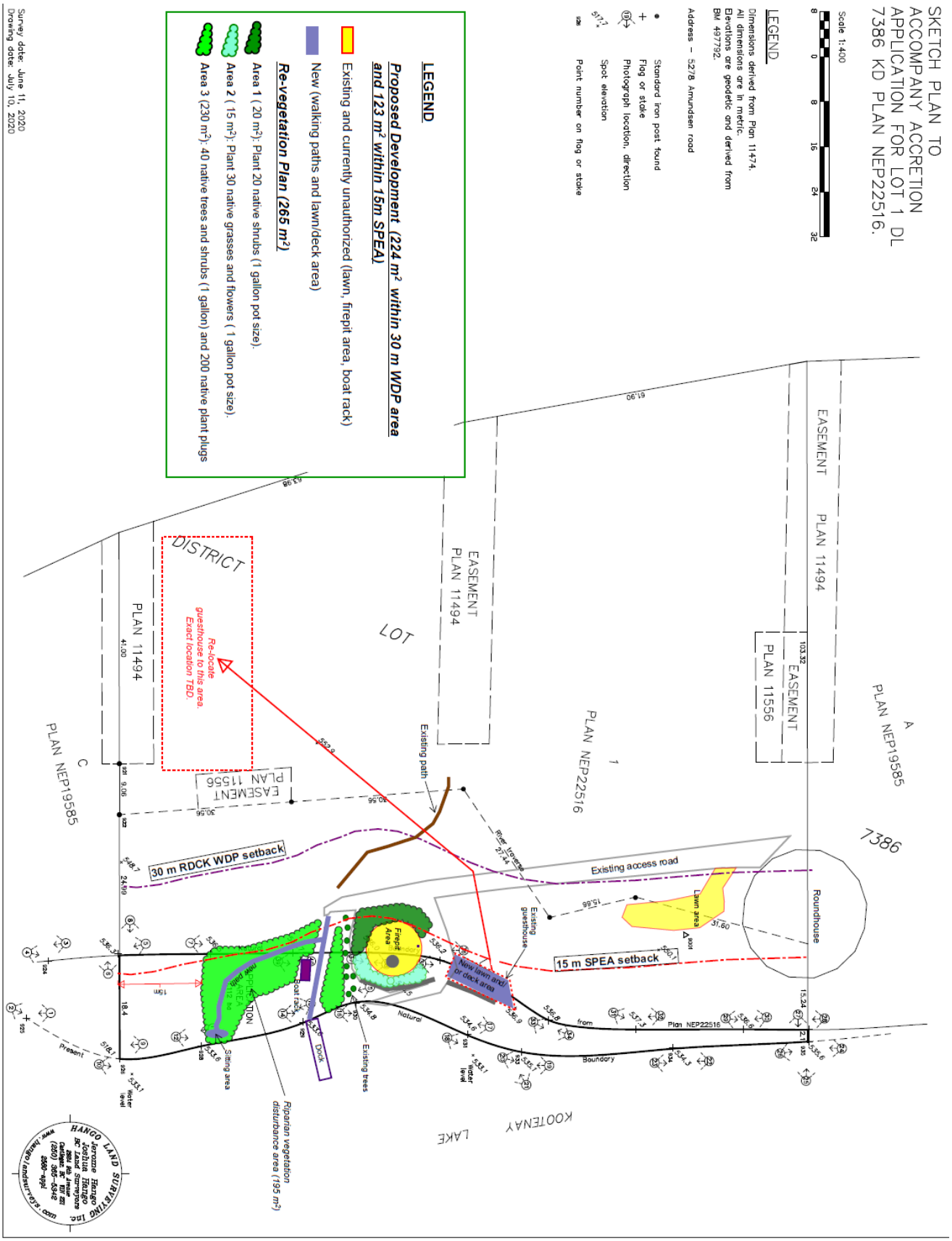
[RDCK] Regional District of Central Kootenays. 2016. Electoral Area 'D' Comprehensive Land Use Bylaw No. 2435, 2016.

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

APPENDIX 1
LOCATION MAP


Kaslo
Project Location
0
1
2 km
5278 Amundsen Rd.
Project Location
1:50000
1/21/2021
MASSE ENVIRONMENTAL
CONSULTANTS LTD.
Kaslo
Crawford Bay
Balfour

APPENDIX 2
SITE AND MITIGATION PLAN


SKETCH PLAN TO ACCOMPANY ACCRETION APPLICATION FOR LOT 1 DL 7386 KD PLAN NEP22516.
Scale 1:400
8 0 8 16 24 32
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
Spot elevation
Point number on flag or stake
LEGEND
Proposed Development (224 m² within 30 m WDP area and 123 m² within 15m SPEA)
Existing and currently unauthorized (lawn, firepit area, boat rack)
New (walking paths and lawn/deck area)
Re-vegetation Plan (265 m²)
Area 1 (20 m²): Plant 20 native shrubs (1 gallon pot size).
Area 2 (15 m²): Plant 30 native grasses and flowers (1 gallon pot size).
Area 3 (230 m²): 40 native trees and shrubs (1 gallon) and 200 native plant plugs
Survey date: June 11, 2020
Drawing date: July 10, 2020
EASEMENT PLAN 11494
EASEMENT PLAN 11556
LOT 1 PLAN NEP22516
A PLAN NEP19585
C PLAN NEP19585
DISTRICT PLAN 11494
EASEMENT PLAN 11556
7386
Roundhouse
Re-locate guesthouse to this area. Exact location TBD.
Existing path
Existing access road
Existing guesthouse
Lawn area
30 m RDCK WDP setback
15 m SPEA setback
Firepit Area
New lawn and/or deck area
Boat rack
Dock
Existing trees
Natural Boundary
Riparian vegetation disturbance area (195 m²)
KOOTENAY LAKE
HANGO LAND SURVEYING Inc.