



REGIONAL DISTRICT OF CENTRAL KOOTENAY

DEVELOPMENT PERMIT

DP1801D-01231.010-JULIEN-DP000082 (DP1801D)

Date: April 25, 2018

Issued pursuant to Section 489 of the *Local Government Act*

1. This Development Permit is issued to Marielle Ferrigno & Steven Julien as the registered owners (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 A DISTRICT LOT 193 KOOTENAY DISTRICT PLAN 14760 (PID 009-934-634) 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. This Development Permit shall not relieve the applicant from meeting Provincial requirements and obtaining Provincial permits, including permits under the *Heritage Conservation Act*.
5. The said lands have been designated as a 'Watercourse Development Permit Area' pursuant to the Area D Comprehensive Land Use Bylaw No. 2435, 2016, as amended.
6. The Permittee has applied to the Regional District of Central Kootenay to build a single family dwelling and to use land and the building situated on the said lands for this purpose. Pursuant to this Development Permit and subject to the terms and conditions herein contained, as well as all other applicable Regional District Bylaws, the Regional District of Central Kootenay hereby authorizes the use of the said lands for this purpose.
7. The Permittee is required to obtain approval in writing from the Regional District of Central Kootenay prior to any further development, including the construction any new buildings, external additions to existing buildings or for any deviation from the development authorized in this Development Permit. Furthermore, the Permittee is hereby advised of the following requirements:
 - 7.1 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.
 - 7.2 Development is authorized in accordance with the terms described in the report titled "4724 Twin Bays Road Riparian Assessment" prepared by Masse Environmental Consultants Ltd., dated February 27, 2018, attached to this permit as Schedule 2, including environmental monitoring, flagging the Streamside Protection and Enhancement Area, and restoring native vegetation.

- 7.3 The Permittee must prevent the re-establishment of invasive species including hawkweed (Hieracium sp.) and knapweed (Centaurea sp.) by hand, mechanical or biological controls present in the 30 metre Riparian Assessment Area.
- 7.4 Further development as defined in the Watercourse Development Permit Area, including:
 - 7.4.1 Removal, alteration, disruption or destruction of vegetation, installation of buildings or structures or impervious or semi-impervious pathways, yard maintenance, flood protection works or the creation of wharves or docks within the 15 metre Streamside Protection and Enhancement Area; and
 - 7.4.2 Removal, alteration, disruption or destruction of the mature patch of Douglas Fir trees adjacent to Twin Bay Road,

other than that authorized by this permit is strictly prohibited, except the removal of trees that have been examined by an arborist and certified to pose an immediate threat to life or property.
- 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.



Sangita Sudan, General Manager of Development Services

April 26, 2018
Date of Approval



Na -

Date of Issuance

Schedule 1: Location Map

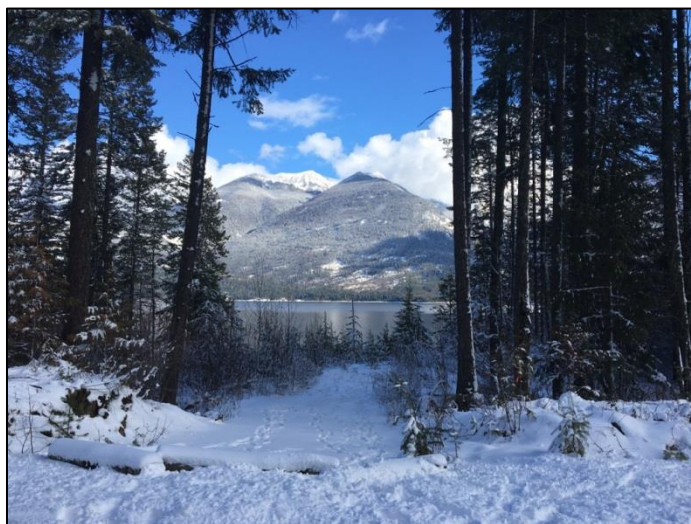
Schedule 2: 4724 Twin Bays Road Riparian Assessment, dated February 27, 2018 by Masse Environmental Consultants Ltd.

Schedule 1: Location Map

		The Regional District of Central Kootenay Box 590, 202 Lakeside Drive, Nelson British Columbia V1L 5R4 Phone: 250-352-6665 Toll Free 1-800-268-7325 Web: www.rdck.bc.ca E-Mail: info@rdck.bc.ca		08-Mar-2018
Property Information Report				
Folio Number:	788.01231.010			EA: D
Site Address:	TWIN BAYS RD			
PID:	009-934-634	Parcel area: 147 179 WIDTH/DEPTH		
Legal Description:	LOT A PLAN NEP14760 DISTRICT LOT 193 KOOTENAY LAND DISTRICT			
				
Land-use Information				
Zoning Designation:	UNZONED			



4724 TWIN BAYS ROAD
KASLO, BC
Riparian Assessment



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

February 27, 2018

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ABBREVIATIONS

- HWM: High Water Mark
- LWD: Large Woody Debris
- RAR: Riparian Area Regulation
- SPEA: Streamside Protection and Enhancement Area
- WDP: Watercourse Development Area
- ZOS: Zones of Sensitivity

1 INTRODUCTION

Masse Environmental Consultants Ltd. was retained by Purcell Timber Frame Homes to conduct a riparian assessment at 4724 Twin Bays Road (Lot A, Plan NEP 14760, District Lot 193, Kootenay District). Purcell Timber Frame Homes is acting as general contractor for Steve and Marielle Julien for the purpose of building a residence on their property. Construction of the proposed building will involve work within the 30 m Watercourse Development Permit Area (WDP) as defined in the Electoral Area 'D' Comprehensive Land Use Bylaw No. 2435, 2016. A site visit was conducted on February 15, 2018 by Sylvie Masse MSc, RPBio, and Tyson Ehlers BSF, RPBio, to conduct a riparian assessment on the property.

This assessment evaluates the existing conditions of the property and riparian areas, identifies important habitat values, assesses the environmental impacts related to the proposed development, and recommends measures to protect environmentally sensitive areas during development. 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
- Provincial 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
- Kootenay Lake Guidance Document

This report has been prepared by Iraleigh Anderson Env. Tech., and reviewed by Sylvie Masse, MSc, RPBio.

I, Sylvie Masse, hereby certify that:

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

1.1 Location

The subject property is located at 4724 Twin Bays Road, approximately 9 km south of Kaslo, BC (Appendix 1). The property covers an area of 0.23 ha, and has 43 m of frontage along Kootenay Lake. The property is situated within a rural subdivision, bordered by private properties to the north and south, Kootenay Lake to the east, and Twin Bays Road to the west.

The project area is within the Interior Cedar Hemlock dry warm variant 1 (ICHdw1) biogeoclimatic subzone. 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. Snow packs are very shallow to shallow and of short duration and combined with the mild climate result in no significant soil freezing.

1.2 Streamside Protection and Enhancement Area

The eastern margin of the subject property is defined by a band of ~20 m high nearly vertical cliffs which drop to Kootenay Lake. The upper margin of these cliffs was defined as the High Water Mark (HWM; see definition below) for the purposes of the field survey of the property. Based on a review of Google Earth imagery, this HWM is consistent with the natural boundary as defined by the Parcel Map BC (PMBC) cadastral fabric. For the purposes of this report, the riparian setbacks, including the Streamside Protection and Enhancement Area (SPEA) and the WDP will be measured from the HWM which coincides with the PMBC natural boundary.

The BC Riparian Regulation (BC 2015) defines the High Water Mark 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);

To determine whether the WDP setback of 30 meters from the HWM of Kootenay Lake aligns with the criteria in the Riparian Area Regulation (RAR), a detailed assessment of the site was conducted to calculate the SPEA for Kootenay Lake on the property. As per the RAR, the large woody debris (LWD), and litter Zone of Sensitivity (ZOS) were plotted 15 m inland from the HWM. The shade ZOS was determined by plotting a traced facsimile of the natural boundary as recorded in the Parcel Map BC cadastral fabric 30 meters due south of its mapped position. The resulting shade ZOS is between 8.25-8.5 m inland from the high water mark on the subject property. The SPEA is determined based on the ZOS with the greatest width. The SPEA throughout the site was determined to be 15 m from the HWM based on the 15 m LWD and litter ZOS. Results for the Zones of Sensitivity (ZOS) and SPEA are presented in Table 1 below, and on the SPEA setback map (Appendix 2).

Table 1. Results of detailed RAR assessment.

Feature Type	SPVT ¹	Zones of Sensitivity			SPEA ³
		LWD	Litter fall	Shade	
Lake	TR	15 m	15 m	8.25-8.5 m	15 m

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

2 PROJECT OVERVIEW

2.1 Existing Site Conditions

The property has been largely cleared of timber approximately 10-13 years ago, and the proposed building site has been landscaped with a low retaining wall and site levelling. The dominant vegetation is a regenerating stand of mixed conifer and deciduous saplings, native shrubs and some invasive weeds. The riparian area east of the proposed site has also been cleared for an additional 5-10 m from the proposed building footprint up to the point where the slope begins to drop sharply to Kootenay Lake. A buffer patch of approximately 15 mature (~120 year-old) Douglas-fir (*Pseudotsuga menziesii*) trees has been retained on the western side of the property adjacent to Twin Bays Road (Photo 1). This small stand of trees provides privacy for the proposed building site by visually blocking Twin Bays Road. The site is accessed via a rough trail to Twin Bays Road, just north of the patch of Douglas-fir (Photo 1). A 5.5 x 7.6 m septic field has been dug in the northwest corner of the property, and a 2700 L septic tank has been installed just northwest of the proposed building footprint (Photo 2; Appendix 3).



Photo 1. Entrance to property from Twin Bays Road and small stand of mature Douglas fir to the left.



Photo 2. Septic field.

2.2 Proposed Development

The proposed development includes:

- Construction of a new timber frame home, and
- Connection of utilities from Twin Bays Road to the new home.

The proposed building is a two storey timber frame home with attached carport and patios, covering a total area of ~183 m² along the southern property margin (Appendix 2). The proposed building site is flat

and currently covered in young regenerating forest. A driveway to the proposed building will access the property from Twin Bays Road to the west along an existing trail.

2.3 Services and Site Drainage

Sewage disposal for the proposed home will be serviced by an existing septic disposal field located on the northwest corner of the property (Appendix 3). The proposed new home will be tied into a community water supply by a line running along the driveway west to Twin Bays Road. Likewise, electrical service will be tied into existing infrastructure via a line running west along the driveway to a power pole on the southwest corner of the property.



Photo 3. Proposed building site.

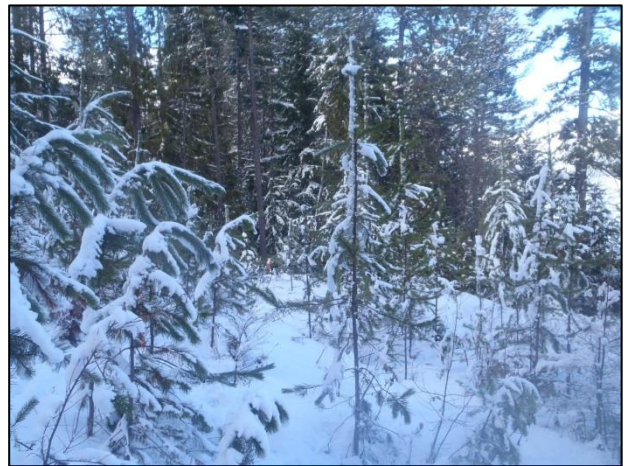


Photo 4. Young forest with SPEA adjacent to building site.

3 RESOURCES

3.1 Fish and Fish Habitat

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

Kootenay Lake supports a variety of fish species (Table 2), including several species of regional interest, such as Gerrard rainbow trout (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), kokanee (*O. nerka*), white sturgeon (*Acipenser transmontanus*), Westslope cutthroat trout (*O. clarki lewisii*), and burbot (*Lota lota*).

The foreshore consists of exposed bedrock cliffs, with some overlying boulders (Photo 5 and Photo 6). The rocky shoreline provides potential rearing and cover habitat for juvenile and adult fish. No aquatic vegetation was observed within the shoreline along this property.

The foreshore inventory mapping (FIM; Cormano and Schleppe 2013) completed as part of the development of the Kootenay Lake Shoreline Management Guidelines (KLP 2017) rated the shoreline in front of the subject property as having a moderate aquatic habitat index value, and moderate juvenile fish rearing potential.

Table 2. Fish species present in Kootenay Lake.

Common Name	Scientific Name	Comments
Burbot	<i>Lota lota</i>	Kootenay Lake population is red listed
Bull Trout	<i>Salvelinus confluentus</i>	Blue-listed species
Brook Trout	<i>Salvelinus fontinalis</i>	Introduced species
Kokanee	<i>Oncorhynchus nerka</i>	
Largemouth Bass	<i>Micropterus salmoides</i>	Introduced species
Largescale Sucker	<i>Catostomus macrocheilus</i>	
Longnose Dace	<i>Rhinichthys cataractae</i>	
Longnose Sucker	<i>Catostomus catostomus</i>	
Lake Whitefish	<i>Coregonus clupeaformis</i>	
Mountain Whitefish	<i>Prosopium williamsoni</i>	
Northern Pikeminnow	<i>Ptychocheilus oregonensis</i>	
Peamouth Chub	<i>Mylocheilus caurinus</i>	
Pumpkinseed	<i>Lepomis gibbosus</i>	Introduced species
Prickly Sculpin	<i>Cottus asper</i>	
Pygmy Whitefish	<i>Prosopium coulteri</i>	
Rainbow Trout	<i>Oncorhynchus mykiss</i>	
Redside Shiner	<i>Richardsonius balteatus</i>	
Slimy Sculpin	<i>Cottus cognatus</i>	
Torrent Sculpin	<i>Cottus rhotheus</i>	
Westslope Cutthroat Trout	<i>Oncorhynchus clarki lewisi</i>	Blue-listed species
White Sturgeon	<i>Acipenser transmontanus</i>	Kootenay Lake population is red-listed
Yellow Perch	<i>Perca flavescens</i>	Introduced species

(Habitat Wizard 2017)

3.2 Riparian Vegetation

The riparian area on the property has an eastern aspect and consists of ~20 m high cliffs, and steep rocky grades above with slopes between 60-70% (Photo 5 and Photo 6). Tree cover is low, though a few mature Douglas-fir remain. Soils are thin, and the development of shrub and herbaceous cover is minimal. Lichens and mosses cover the rocky outcrops throughout the riparian zone. The western margin of the riparian area has been cleared of timber and vegetation is currently dominated by regenerating mixed conifers and black cottonwood (*Populus trichocarpa*; photo 2). Observations of invasive weed species include hawkweed (*Hieracium* sp.) and knapweed (*Centaurea* sp.), though winter conditions precluded a complete assessment of all herbaceous species.

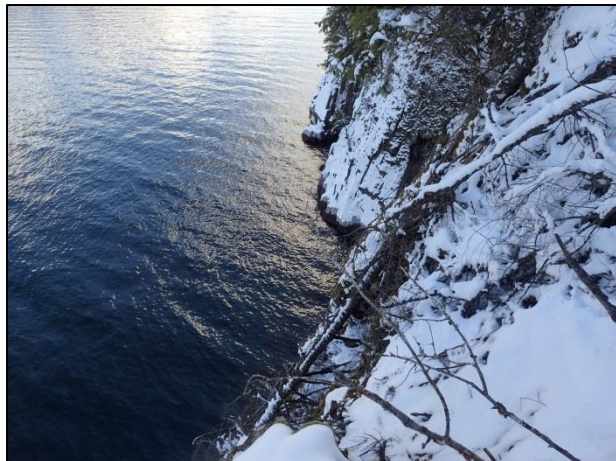


Photo 5. Shoreline habitat and riparian vegetation.



Photo 6. Shoreline habitat and riparian vegetation.

Table 3. Plant species list.

Common Name	Scientific Name	Common Name	Scientific Name
Trees		Shrubs	
western redcedar	<i>Thuja plicata</i>	willow	<i>Salix</i> sp.
western larch	<i>Larix occidentalis</i>	thimbleberry	<i>Rubus parviflorus</i>
lodgepole pine	<i>Pinus contorta</i>	soopolallie	<i>Shepherdia canadensis</i>
Douglas-fir	<i>Pseudotsuga menziesii</i>	rose	<i>Rosa</i> sp.[Native]
black cottonwood	<i>Populus trichocarpa</i>	rose	<i>Rosa</i> sp.[Introduced]
Herbaceous		red-osier dogwood	<i>Cornus stolonifera</i>
round-leaved alumroot	<i>Heuchera cylindrica</i>	paper birch	<i>Betula papyrifera</i>
licorice fern	<i>Polypodium glycyrrhiza</i>	oceanspray	<i>Holodiscus discolor</i>
knawweed	<i>Centaurea</i> sp.	mallow ninebark	<i>Physocarpus malvaceus</i>
hawkweed	<i>Hieracium</i> sp.	falsebox	<i>Paxistima myrsinites</i>
bracken fern	<i>Pteridium aquilinum</i>	Douglas maple	<i>Acer glabrum</i>
Lichen		common juniper	<i>Juniperus communis</i>
textured lung	<i>Lobaria scrobiculata</i>	black raspberry	<i>Rubus leucodermis</i>
lime dust	<i>Chrysothrix chlorina</i>		
lesser toad pelt	<i>Peltigera venosa</i>		
gray reindeer	<i>Cladina rangiferina</i>		
deciduous pelt	<i>Peltigera britannica</i>		
cladonia	<i>Cladonia</i> sp.		

3.3 Wildlife

3.3.1 Reptiles and Amphibians

The rocky outcrops on this property have potential to support reptile species, such as the western skink (*Plestiodon skiltonianus*). The western skink is a blue listed species in BC, which has been recorded

14 km south at Coffee Creek. The presence of western skinks, or any other reptile species could not be investigated on site due to the time of the survey.

3.3.2 Birds

No raptor nests were observed, though the site features several valuable wildlife trees, including a large veteran Douglas-fir at the edge of the cliff at the northeast corner of the property, and a medium sized Douglas-fir snag on the cliff at the center of the property, which provide perching, and potential nesting habitat for raptors.

Kinglets (*Regulus* sp.) were observed foraging in the mature Douglas-fir trees surrounding and within the property. The small patch of reserved trees, along with the rocky outcrops and two wildlife trees in the riparian area, appear to be the most important bird habitat features on site.

The rest of the site is dominated by young regenerating forest. Though the young forest habitat type is very common and of relatively limited ecological significance, it may be used by songbirds each year during the breeding season.

3.3.3 Mammals

Shrubby areas regenerating from past land clearing on the site provide forage for ungulates. Signs of ungulate browse on willows (*Salix* sp.) were observed during the survey, and several mule deer (*Odocoileus hemionus*) were observed along the highway near the site.

No further signs of large mammal activity on site were observed. It is unlikely that the rocky foreshore cliffs are utilized by large mammals accessing the Kootenay Lake riparian area from the surrounding uplands. Limited access also likely precludes riverine species such as otter and beaver from utilizing the property. The rocky outcrops above the cliffs provide suitable shelter for small mammals and possibly bats.

3.4 Species at Risk

A 12 km buffer around the subject property was used to query BC Conservation Data Center records for known species at risk occurrences. Four species with known occurrence in the immediate area around the project site include white sturgeon (*Acipenser transmontanus*; Table 4), wild licorice (*Glycyrrhiza lepidota*), painted turtle (*Chrysemys picta*), and Piper's anemone (*Anemone piperi*). White sturgeon are a wide ranging fish species which occur throughout Kootenay Lake. White sturgeon in Kootenay Lake belong to the Kootenay River population which is listed as Endangered, and protected under the Federal *Species at Risk Act*. Stewardship of riparian areas along Kootenay Lake contributes to the protection of white sturgeon. Painted turtles are an obligate wetland species, and are not expected to occur within the subject property. Wild licorice and Piper's anemone both require moist soils, and are unlikely to occur on in the well-drained rocky habitat on the subject property. Given the time of year, and the scope of this assessment it is impossible to rule out the presence of rare or at risk species on this site.

Table 4. Species at risk.

Common Name	Scientific Name	Comments
white sturgeon	<i>Acipenser transmontanus</i>	Red listed. Kootenay Lake population.
wild licorice	<i>Glycyrrhiza lepidota</i>	Blue Listed. Mirror Lake occurrence 6 km north.
painted turtle	<i>Chrysemys picta</i>	Blue Listed. Mirror Lake occurrence 6 km north.
Piper's anemone	<i>Anemone piperi</i>	Red listed. Northwest of Kaslo 14 km.

(CDC 2018)

4 MEASURES TO PROTECT THE INTEGRITY OF SPEA

The proposed development involves the construction of a new 183 m² timber frame home within the 30 m WDP area. The building footprint consists mostly of young forest regenerating from site clearing and preparation from ~10-13 years ago. No part of the proposed building footprint extends within the 15 m SPEA, and no further land clearing or disturbance within the SPEA will be required during construction. Proposed development activities on the building site should not pose a threat to the ecological integrity of adjacent areas of the SPEA, provided environmental best management practices outlined in this section are followed during construction activities.

An assessment was conducted to determine the potential for environmental hazards within the SPEA, including windthrow, slope stability, and hazard trees. General environmental procedures recommended to protect the integrity of the SPEA include environmental monitoring, appropriate scheduling of environmentally sensitive activities, concrete management, construction waste management, sediment control, retaining native vegetation, and invasive plant management.

4.1 Scheduling of Environmentally Sensitive Activities

In order to avoid potential wildlife impacts, any clearing of young forest within the building footprint should occur within the least risk work period for nesting birds (August 1- March 31). Under the provincial *Wildlife Act* it is unlawful to disturb nesting birds, their nests, and eggs. If removal of vegetation is scheduled outside of the least risk work window, a nesting bird survey is recommended prior to work.

4.2 Hazard Trees

No potential hazard trees were identified in the SPEA. Most of the subject property was cleared 10-13 years ago and the property consists mainly of a young regenerating forest. It is not anticipated that trees will need to be removed from the SPEA for human safety or property damage prevention purposes. However, it is important to note that mature trees are present on neighboring properties and that an assessment was not conducted by a Registered Professional Forester (RPF) at this time.

4.3 Windthrow

There is little windthrow risk within the SPEA because most of the site is covered in a young regenerating forest. It is unlikely that the proposed construction activities on site will increase the windthrow risk to trees in the SPEA. There may be some risk of windthrow for large trees on adjacent properties, and the

residual clump of mature Douglas-fir on the southwest corner of the property resulting from the most recent clearing of trees on this site 10-13 years ago, however, remaining trees do not appear to have been subject to windthrow in the past years. A full assessment of windthrow risk by a Registered Professional Forester (RPF) was not completed as part of this survey, and there is no apparent evidence that such an assessment is required.

4.4 Slope Stability

The upper section of the property is gently sloping to the north and includes a generally flat area encompassing the proposed building site. A slope break running along the eastern fringe of the property separates the upper section from a transitional zone with slopes between 60 – 67% running for between 7.7 - 14.5 m before the edge of the cliff. The proposed building footprint is sited on the southeast corner of the property set back from the slope break. The eastern edge of the building footprint is defined by the edge of the proposed patio. The north patio footing is 4.4 m from the slope break, and the south patio footing is set back 10 m from the slope break. No slope stability hazard indicators were observed; however, winter conditions precluded a complete assessment of soils and terrain on site. These observations do not confirm the absence of terrain stability issues as a geotechnical assessment was not completed by a P.Geo. or a P.Eng.

4.5 Protection of Trees and Vegetation in the SPEA

The following measures should be implemented to protect vegetation within the SPEA:

- Clearing of vegetation should be kept to the minimum possible area required for access, staging, construction works, and safety considerations.
- The SPEA should be flagged prior to work, and no vegetation should be removed or modified within the SPEA. Though some clearing has occurred in the SPEA within the past 10-13 years, at present much of this area is presently regenerating a mix of native tree species. Regenerating riparian vegetation must be preserved to ensure the redevelopment of a functioning riparian ecosystem within the SPEA.

4.6 Encroachment

The property owners do not intend to encroach into the SPEA and will allow the young regenerating forest within the SPEA to re-establish. Though the owners wish to access the views of Kootenay Lake from within the SPEA, there are no plans for any further clearing of vegetation in this area. Any other activities that may cause impacts to the riparian vegetation should be avoided.

4.7 Sediment and Erosion Control

Excavation during construction of the proposed house foundation carries the risk of erosion and sediment releases into Kootenay Lake. 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.

- Stockpiles of soil should be located at least 30 m from Kootenay Lake and covered with tarps to prevent erosion and establishment of invasive weeds if they are left for greater than two months.

4.8 Stormwater Management

Stormwater runoff, if present, should be controlled and redirected away from exposed soils. In the event of heavy rainfall, additional mitigation measures may be required.

4.9 Floodplain concerns

The property is located above a ~20 m high rock cliff and there are no floodplain issues that may affect the SPEA.

4.10 Construction Waste Management

All construction waste generated on site must be taken off site and re-used, recycled or disposed of accordingly. Construction personnel should be instructed to ensure the site is kept clean and to prevent litter from escaping the site. Concrete will likely be used in the construction of the house foundation. Fresh concrete and concrete laden water is caustic and toxic to aquatic organisms. The following precautions should be taken when handling concrete to ensure the protection of Kootenay Lake:

- Concrete waste should be collected and disposed of at an approved disposal site.
- Washing of equipment used during concrete work should occur at a designated location at least 30 m away from Kootenay Lake where wash water will not drain directly into the lake.

4.11 Invasive Plant Management

Construction activities can potentially increase dispersal of invasive plant species which can out-compete native riparian vegetation, causing damage to habitat and ecosystem function. Invasive species observed onsite include knapweed and hawkweed. The following mitigation measures are recommended in order to reduce the establishment and proliferation 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.
- Amount of vegetation clearing and soil disturbance should be minimized.
- All exposed soils should be re-seeded as soon as possible following completion of the project.
- Removal of invasive plants currently on site is recommended if feasible.

5 ENVIRONMENTAL MONITORING

Prior to construction, a Qualified Environmental Professional should visit the site and flag the SPEA and areas of native vegetation to be protected during construction activities, and to review measures to protect the SPEA with personnel operating on site. Further site visits may be necessary to ensure that the integrity of SPEA and other valued ecological features, including wildlife trees, are being protected during construction.

6 CONCLUSION

The proposed footprint for a new timber frame home at 4724 Twin Bays Road is within the 30 m WDP area. A detailed assessment of the site was conducted, and a SPEA setback of 15 m was determined. The proposed footprint of the new home does not encroach within the 15 m SPEA, and the impacts of the proposed construction are not expected to affect the function and structure of the SPEA, provided the measures to protect the SPEA outlined in this report are followed.

7 CLOSURE

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

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

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

Prepared by:



Iraleigh Anderson, Env. Tech.

Reviewed by:



**Sylvie Masse, M.Sc., R.P.Bio.
College of Applied Biology: R.P.Bio. #834**

8 REFERENCES

- [BC] Province of British Columbia. 2015. Riparian Areas Regulation. Victoria, British Columbia, Canada.
- [CDC] Conservation Data Center. 2018. Species and Ecosystems at Risk Publicly available Occurrences. <https://catalogue.data.gov.bc.ca/dataset/species-and-ecosystems-at-risk-publicly-available-occurrences-cdc>
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- [MOE] Ministry of Environment. 2014. Develop with Care. Province of British Columbia. Victoria, British Columbia, Canada.
- [MOE] Ministry of Environment. 2015. General BMPs and Standard Project Considerations. Victoria, British Columbia, Canada.
- [MOE] Ministry of Environment. 2016. Provincial Water Sustainability Act. Victoria, British Columbia, Canada.
- [MOE] Ministry of Environment. 1996. Tree Replacement Criteria. BC Environment. Lower Mainland Region.
- [MOE] Ministry of Environment. Habitat Wizard. 2018. <http://www.env.gov.bc.ca/habwiz/>.

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

APPENDIX 1
LOCATION MAP

4724 Twin Bays Road

Legend

-  Lakes (Mid Scale)
- ParksAndTenures**
 -  Park
 -  Recreation Site or Reserve
 -  Wildlife Management Area

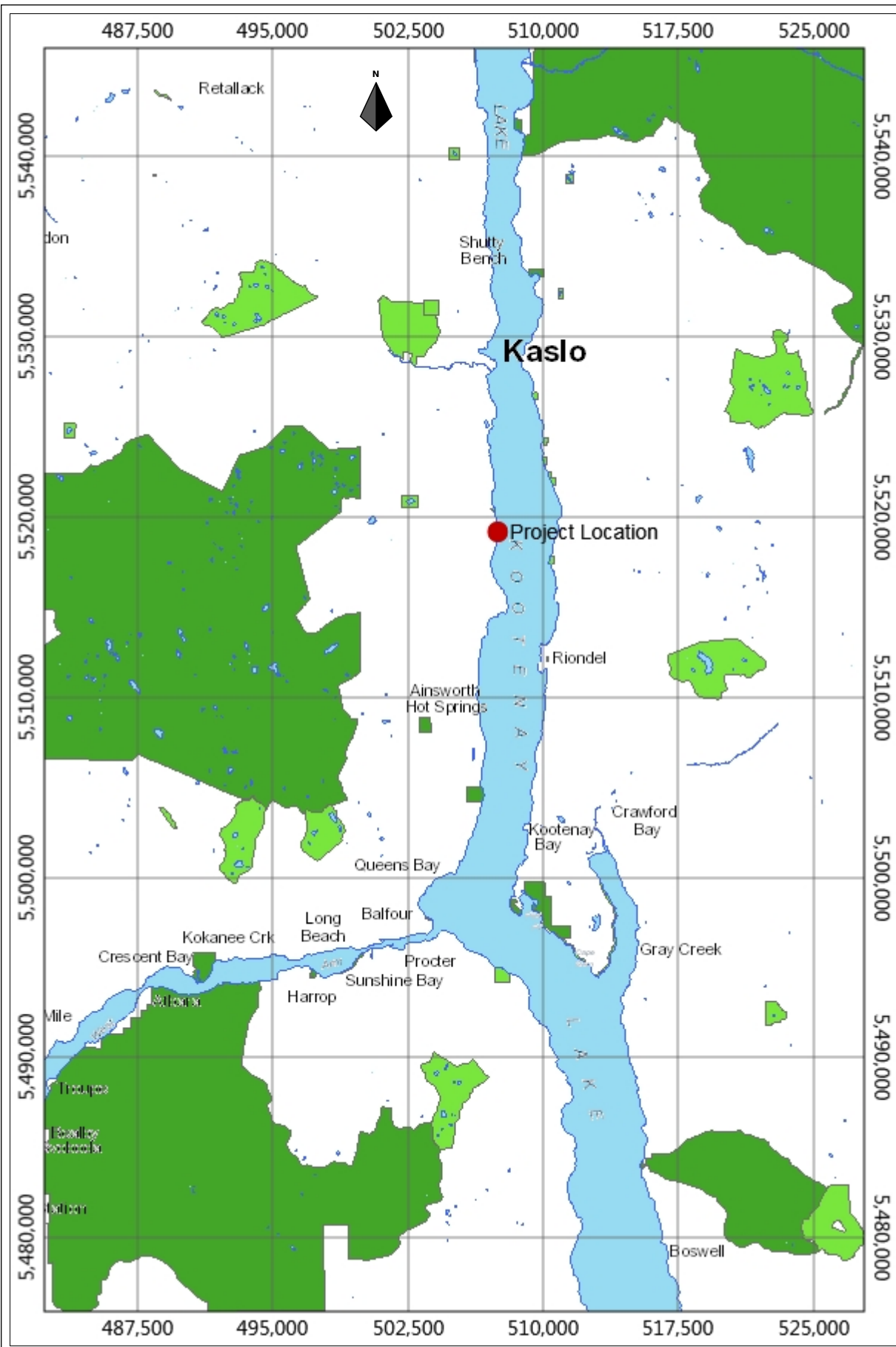
Notes

Lot A, Plan NEP 14760,
District Lot 193, Kootenay
District

Date Plotted: 2/20/2018



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



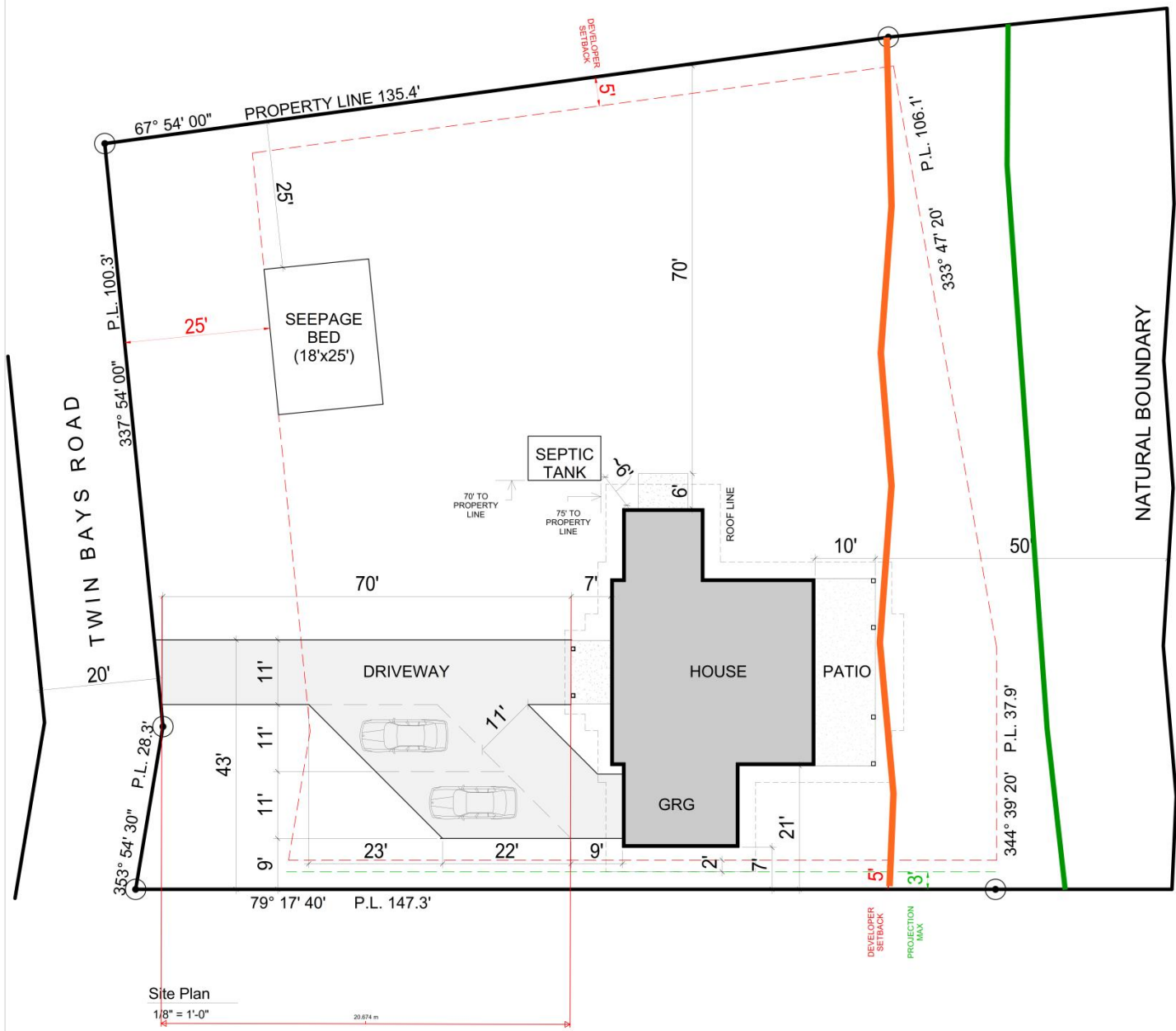
0 31,022.03 Meters 10cm

1 : 310,220.28

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

APPENDIX 2

SITE PLAN AND STREAMSIDE ENHANCEMENT AND PROTECTION AREA SETBACK MAP



Site Plan
1/8" = 1'-0"
20.674 m

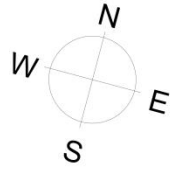
APPLICANT:
STEVE AND MARIELLE JULIEN
Tel # 1 604 379 2036

LEGAL ADDRESS:
LOT A
PLAN NEP14760
DISTRICT LOT 193
KOOTENAY LAND DISTRICT
PID: 009-934-634

CIVIC ADDRESS:
4724 TWIN BAYS RD. (FLETCHER CREEK),
KASLO, BC

15 m litter ZOS, LWD ZOS, and SPEA

~8 m Shade ZOS



APPENDIX 3
SEPTIC LAYOUT DRAWING 2004

FOLIO NUMBER	DATE OF APPLICATION (YYYY / MM / DD) 2004/07/09	<input checked="" type="checkbox"/> New Construction <input type="checkbox"/> Repair <input type="checkbox"/> Alteration	
OWNER INFORMATION Correspondence to be sent to <input checked="" type="checkbox"/> owner	NAME OF OWNER ROBERT J FROESE		TELEPHONE NUMBER 250-353-9625
	Number and Street RR#2, 53, C15		City KASLO
APPLICANT INFORMATION Correspondence to be sent to <input checked="" type="checkbox"/> applicant	NAME OF APPLICANT ROBERT J. FROESE		TELEPHONE NUMBER 250-353-9625
	Number and Street RR#2, 53, C15		City KASLO
LOT INFORMATION	LEGAL DESCRIPTION OF WHERE DISPOSAL SYSTEM IS TO BE CONSTRUCTED LOTA DISTRICT LOT 193 KOOTENAY DISTRICT PLAN 14760		
	STREET ADDRESS / GENERAL LOCATION LOT A TWIN BAYS RD. FLETCHER CREEK		
PREMISE INFORMATION	SEWAGE DISPOSAL SYSTEM WILL SERVE: <input checked="" type="checkbox"/> SINGLE FAMILY DWELLING <input type="checkbox"/> DUPLEX <input type="checkbox"/> OTHER (specify): _____	NUMBER OF BEDROOMS: 2	FINISHED BASEMENT <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	ESTIMATED DAILY SEWAGE FLOW: 300 I/GPD	TOTAL LIVING AREA: 1800 SQ. FT.	DO YOU INTEND TO ADD A BASEMENT SUITE OR MORE BEDROOMS IN THE FUTURE? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
SYSTEM INFORMATION	TYPE OF SEWAGE DISPOSAL SYSTEM: <input type="checkbox"/> CONVENTIONAL <input type="checkbox"/> ALTERNATE (E.G. <input type="checkbox"/> PRIVY <input type="checkbox"/> LAGOON, <input type="checkbox"/> RAISED MOUNDS, <input checked="" type="checkbox"/> SEEPAGE BED) <input type="checkbox"/> DEEP TRENCH <input type="checkbox"/> OTHER (specify): _____		SEPTIC TANK MANUFACTURER MATERIAL OF SEPTIC TANK CONCRETE
	TOTAL LENGTH OF DRAINAGE PIPE		LIQUID VOLUME OF TANK 600 IG
	TYPE OF DRAINAGE PIPE: <input type="checkbox"/> PVC <input type="checkbox"/> OTHER (specify): _____		INSIDE DIAMETER OF PIPE
	IF PACKAGED TREATMENT PLANT IS PROPOSED GIVE: MAKE MODEL	TREATMENT CAPACITY	SEWAGE PUMP: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
ALTERNATE INFORMATION	PRESSURE DISTRIBUTION PROPOSED <input type="checkbox"/> YES <input type="checkbox"/> NO	LAGOON SIZE	DEPTH OF CLAY SOIL <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
SITE INFORMATION	SOIL DESCRIPTION DEPTH OF SOIL: <input checked="" type="checkbox"/> over 1.2 m (4 ft.) <input type="checkbox"/> under 1.2 m (4 ft.) If under 1.2m (4 ft.), due to <input type="checkbox"/> rock or <input type="checkbox"/> clay at _____ ft. from surface. DEPTH TO WATER TABLE: <input checked="" type="checkbox"/> over 1.2 m (4 ft.) <input type="checkbox"/> under 1.2 m (4 ft.) If under 1.2m (4 ft.) the depth is _____		
	PERC TESTS SLOWEST RATE FROM test hole #1 <u>7</u> min./2.5 cm (1 inch) test hole #2 <u>6</u> min./ 2.5 cm (1 inch) AVERAGE OF SLOWEST RATE FROM EACH TEST HOLE <u>6.5</u> min./ 2.5 cm (1inch)		
	WATER INFORMATION SOURCES OF DOMESTIC WATER: <u>FLETCHER CREEK I.D.</u> DISTANCES OF PROPOSED DISPOSAL FIELD FROM: _____ source of domestic water _____ breakout point _____ own well _____ neighbouring wells <u>120 ft</u> stream or lake <u>10' MIN</u> water lines		
RESTRICTIVE COVENANTS	ARE THERE ANY RESTRICTIVE COVENANTS / EASEMENTS WHICH WILL AFFECT THE DESIGN OR LOCATION OF THE SEWAGE DISPOSAL SYSTEM? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, explain		
APPLICANT SIGNATURE	The information on this application is accurate and true to the best of my knowledge: <input checked="" type="checkbox"/> Owner or <input type="checkbox"/> Agent Signature _____ Date (yyyy/mm/dd) <u>2004/07/09</u>		OFFICE USE ONLY PAID: <u>CO</u> DATE: <u>2004/07/15</u> INITIALS: <u>PK</u>
	X <u>[Signature]</u> A plot plan must be submitted with this application (refer to opposite page)		

PERMIT TO CONSTRUCT, INSTALL, ALTER OR REPAIR

FOLIO / LOT NUMBER

Pursuant to this application and the Sewage Disposal Regulations, permission is hereby granted to construct, install, alter, or repair the sewage disposal system on this property. This permit may be cancelled if variations are made to these plans and specifications.

Conditions of Permit: 350 ft² soopage bed. Min 21 inches of drainrock under pipe. Install as per approved template. Maximum burial depth of pipe to be 20 inches

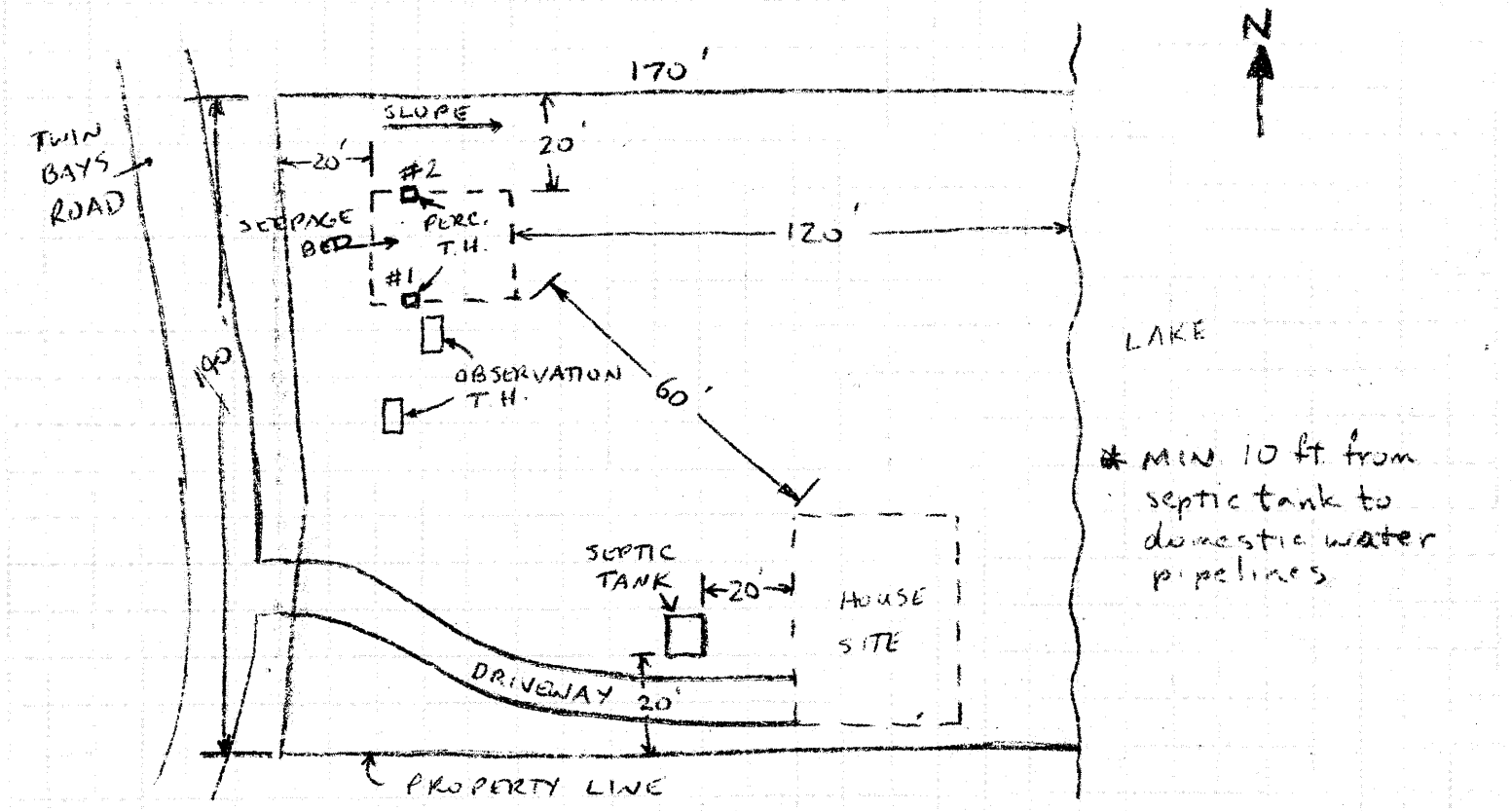
DATE PERMIT VALID: July 27/04 SIGNATURE OF PUBLIC HEALTH INSPECTOR / EHO: *[Signature]*

FOR PUBLIC HEALTH INSPECTOR / EHO USE ONLY		COMMENTS
SITE EVALUATION	SITE INFORMATION	
<input type="checkbox"/> file check	<input type="checkbox"/> soil type <u>sandy</u>	
<input type="checkbox"/> application complete and consistent	<input type="checkbox"/> soil depth <u>51 ft</u>	
<input type="checkbox"/> soil requirements met	<input type="checkbox"/> water table <u>7 ft</u>	
<input type="checkbox"/> setback distances	<input type="checkbox"/> slope <u>5-10%</u>	

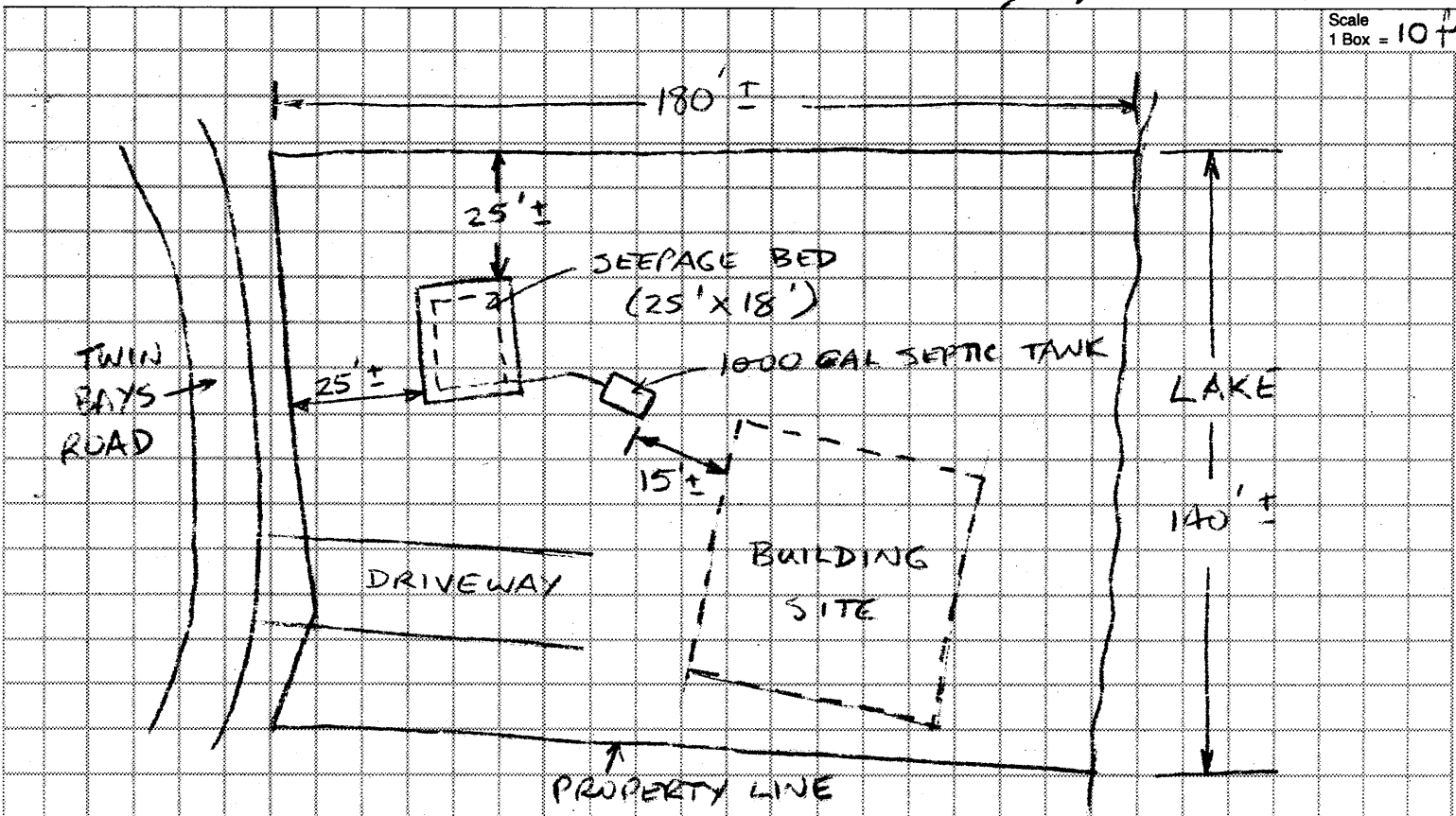
PLOT PLAN DRAWN TO SCALE (to be completed by the Applicant/Contractor)

- PLOT PLAN CHECKLIST** The following items should appear on the plot plan of the proposed system. Indicate which items have been included by checking the appropriate box.
- | | | | | |
|---|--|---|--|---|
| <input checked="" type="checkbox"/> house (or house site) | <input type="checkbox"/> water lines | <input checked="" type="checkbox"/> roadways | Distance from septic tank: | Distance from disposal field (or lagoon/mound): |
| <input type="checkbox"/> other buildings | <input checked="" type="checkbox"/> percolation test holes (2) | <input type="checkbox"/> patio / deck | <input checked="" type="checkbox"/> to house | <input checked="" type="checkbox"/> to house |
| <input checked="" type="checkbox"/> septic tank | <input checked="" type="checkbox"/> observation test holes (2) | <input type="checkbox"/> paved areas | <input type="checkbox"/> to domestic water source | <input checked="" type="checkbox"/> to perimeter of lot |
| <input type="checkbox"/> pkg. treatment plant | <input checked="" type="checkbox"/> surface water (creeks, streams, lakes) | <input type="checkbox"/> parking areas | <input checked="" type="checkbox"/> to domestic water pipeline | <input type="checkbox"/> to own well |
| <input checked="" type="checkbox"/> disposal field | <input type="checkbox"/> retaining wall | <input checked="" type="checkbox"/> dimensions of lot | <input checked="" type="checkbox"/> to perimeter of lot | <input type="checkbox"/> to neighbouring wells |
| <input type="checkbox"/> drinking water sources | <input checked="" type="checkbox"/> "North" arrow | <input checked="" type="checkbox"/> property lines | | <input checked="" type="checkbox"/> to surface water (springs, streams, creeks, etc.) |
| <input type="checkbox"/> yours <input type="checkbox"/> adjacent neighbours | <input type="checkbox"/> direction of and percentage of ground slope | <input type="checkbox"/> swimming pool | | <input type="checkbox"/> to interceptor drains |

Scale
1 box = 10 ft



FOLIO NUMBER	DATE OF APPLICATION (Y/M/D) 2004/10/29	NAME OF OWNER ROBERT J. FROESE	NAME OF CONTRACTOR
LEGAL DESCRIPTION OF LOT LOT A DISTRICT LOT 193		STREET ADDRESS / GENERAL LOCATION LOT A TWIN BAYS ROAD KASLO, B.C.	
KOOTENAY DISTRICT PLAN 14760		INSTALLED AS PER REGULATIONS <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	SIGNATURE OF OWNER / APPLICANT <i>[Signature]</i>
AS BUILT DIAGRAM : to be completed by the contractor or applicant			



The Ministry of Health does not guarantee the useable life of the sewage disposal system. The life of the system is affected by the use and maintenance it receives. Pump out the septic tank every 2-3 years. For servicing of package treatment plants, consult your local service agent. For service guarantees, consult your local sewage disposal contractor. If the system needs repair or modification, a new permit is required.

If the system is not authorized for backfilling and if corrections are required, a re-inspection fee of \$100 must be paid for each time the Public Health Inspector checks to see that the faults have been corrected.

DATE BACKFILL / USE AUTHORIZED Oct 29	SUBJECT TO THE FOLLOWING CONDITIONS:
SIGNATURE PUBLIC HEALTH INSPECTOR / EHO: <i>[Signature]</i>	

FOR PUBLIC HEALTH INSPECTOR / EHO USE ONLY					
APPROVED	REJECTED	NOT APPLICABLE	APPROVED	REJECTED	NOT APPLICABLE
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	septic tank	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	package treatment plant other (e.g. lagoon, holding tank) specify: _____	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	field laterals	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	distribution box	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	siphon	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	curtain drain	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	interceptor drains	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	pump	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	drain rock	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	set back distances	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	fill	<input type="checkbox"/>	<input checked="" type="checkbox"/>