Appendix D: Supplemental Reports and Supporting Information

1. Environmental Assessment Report, May 2022 - RZ000280

ENVIRONMENTAL ASSESSMENT
FOR THE PROPOSED SANDCUT ECO-RESORT AT 11237 WEST COAST ROAD

PREPARED FOR:

Redacted: Pursuant to Section 22 of British Columbia's *Freedom of Information and Privacy Protection Act.* [redacted]

11237 WEST COAST RD
SHIRLEY, BC V9Z 1G8

AND

IAIN LAWRENCE
CAPITAL REGIONAL DISTRICT
3 – 7450 BUTLER RD
SOOKE, BC V9Z 1N1

CORVIDAE PROJECT #2021-030
MAY 2022

CORVIDAE
ENVIRONMENTAL CONSULTING INC

SOLUTION ORIENTED. PROTECTION OF THE ENVIRONMENT. ABSOLUTE INTEGRITY. OPEN COMMUNICATION. RESPECT.

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CAVEAT

This Environmental Assessment (EA) has been prepared with the best information available at the time of writing, including the CRD Official Community Plan, communications with the client and regulators, site visits, review of site plans and design drawings and other documentation relevant to the project. This EA has been developed to assist the project in remaining in compliance with relevant environmental regulations, acts and laws pertaining to the project and to identify and mitigate the expected impacts of the project and reclamation activities directly related to the project.

1 INTRODUCTION

Corvidae Environmental Consulting Inc. (Corvidae) is pleased to provide this Environmental Assessment (EA) for the proposed changes to 11237/11269/11275 West Coast Rd (the property; PID 024-937-207 and 009-590-412).

This document addresses the requirements in Section 5 of Bylaw No. 4001 and provides an assessment on the environmental conditions on the property, potential impacts of the proposed development, and recommendations on the protection of environmentally sensitive features and methods to minimize impacts of the proposed development. The property is intersected at the western end by Sandcut Creek (Figure 1). Three mapped Development Permit Areas (DPAs; Bylaw 4001, see Section 1.3 for details) are present on the property: Shoreline DPA, Riparian DPA, Sensitive Ecosystem DPA (fringe forest). A Riparian Areas Protection Regulation report (Appendix A) will be completed in parallel to this assessment.

1.1 CURRENT CONDITIONS

The current property owner acquired the property in 2017. An existing house and a small cabin near Sandcut Creek were present on the property when it was purchased. A Riparian Area Regulation assessment was completed on the creek in 2011 and a 15 m SPEA was recommended.

The property is accessed by three driveways: access to the main house (marked as 11237 West Coast Road); access to 11275, the westernmost portion of the property (narrow and gated); access to the cabin and cleared areas on the east bank of Sandcut Creek (marked as 11269 West Coast Road). The latter driveway has been surfaced with crushed rock. A small permanent utility shed has been constructed next to the driveway, and a plastic water cistern placed behind it where a water line is accessed.

In 2018 and 2019, the current property owner undertook brushing and clearing of parts of the property for future development of an ecofriendly camping accommodation. A previously cleared area in the centre of the western part of the property was re-cleared (Photo 5). In addition, an area along the eastern bank of Sandcut Creek has been recently cleared and grubbed, with some ground leveling. The existing cabin, the driveway, the utilities shed and the recently cleared area on the eastern bank of Sandcut Creek were located within the Riparian DPA as mapped by CRD (CRD 2019). A Conditions and Impacts report was completed for the development by Corvidae (Corvidae 2019).

A new road network was constructed in 2019 to access the eastern part of the property. Several small clearings and structures have been built on the property to the east of the highway, all outside the riparian DPAs for the streams on the property.

1.2 PROPOSED DEVELOPMENT

The property owner is seeking to rezone the Site from AF-Forestry to Intensive Commercial Recreation Zone CR-3 and construct a campground and resort on the property. The proposed development will include 26 RV sites, 69 tent campsites, 27 A-frame cottages, and 11 yurt/dome tents adjacent to existing roads as well as new roads that will also be constructed. A reception/general store and workshop will also be included as part of the development.

1.3 REGULATORY FRAMEWORK

This environmental assessment is designed to comply with the provisions set out in the Shirley-Jordan River Official Community Plan (OCP) for development permit areas and for compliance with the provisions for environmental protection contained in the following relevant legislation:

Municipal

- Shirley-Jordan River OCP, Bylaw No. 4001

520 Shoreline Development Permit Area (DPA)

That part of the Shirley – Jordan River Plan area indicated as Shoreline Protection DPA on Schedule D is designated as a development permit area pursuant to Sections 488(1)(a) and 488(1)(b) of the Local Government Act (LGA). The Shoreline Protection DPA established under this section includes all land lying 15 metres upland of the natural boundary of the ocean.

530 Riparian DPA

That part of the Shirley – Jordan River Plan area indicated as Riparian DPA on Schedule D is designated as a development permit area pursuant to Sections 488(1)(a) and 488(1)(i) of the Local Government Act (LGA). The Riparian DPA established under this section also includes all lands entirely or partially within a riparian assessment area as defined by the Riparian Areas Regulations (RAR), which includes: (a) for a stream, the 30 metre strip on both sides of the stream, measured from the high water mark, (b) for a ravine less than 60 metres wide, a strip on both sides of the stream measured from the high water mark to a point that is 30 metres beyond the top of the ravine bank, and (c) for a ravine 60 metres wide or greater, a strip on both sides of the stream measured from the high water mark to a point that is 10 metres beyond the top of the ravine bank.

540 Sensitive Ecosystem DPA

That part of the Shirley – Jordan River area indicated as Sensitive Ecosystem DPA on Schedule E is designated as a development permit area pursuant to Sections 488(1)(a) and 488(1)(i) of the Local Government Act (LGA). The Sensitive Ecosystem DPA established under this section includes those sensitive ecosystems and other important ecosystems identified as Intertidal, Estuarine, Freshwater, Older Forest, Mature Forest, Fringe Forest, Woodland, Herbaceous, Sparsely Vegetated, Wetlands, and Riparian in the Sensitive Ecosystem Inventory (SEI) prepared by Madrone Environmental in 2014. The Sensitive Ecosystem DPA includes the strip of land 30 metres from the natural boundary on either side of all watercourses.

The guiding principle for the use of Development Permits is found within the Local Government Act. Development Permit Areas can be designated for purposes such as, but not limited to the following:

- Protects, enhances and restores the biodiversity and ecological values and functions of environmentally sensitive areas.
- Fosters compatibility between development, existing land uses and environmentally sensitive areas.
- Maintains connectivity between sensitive ecosystems; and

- Protects water quality and quantity.

Provincial

- *Wildlife Act* (1996)
- Invasive Species Council of BC
- *Weed Control Act* (1996, current as of October 2016)
- *Water Sustainability Act* (Updated December 2021)
  - Activities in and about a stream, including culverted road crossings and bridge installation, require a Section 11 notification under the WSA
- Riparian Areas Protection Regulation (2019)
  - The objective of the Riparian Area Protection Regulation (RAPR) is to preserve and enhance sensitive riparian ecosystems, including vegetation and coarse woody debris, shade and hydrogeological conditions that are vital for maintaining stream health and productivity.
  - In the RAPR, a Streamside Protection and Enhancement Area (SPEA) is defined as "an area (a) adjacent to a stream that links aquatic to terrestrial ecosystems and includes both existing and potential riparian vegetation and existing and potential adjacent upland vegetation that exerts an influence on the stream, and (b) the size of which is determined according to this regulation on the basis of an assessment report provided by a qualified environmental professional in respect of a development proposal."

Federal

- *Migratory Birds Convention Act* (1994)
- *Species at Risk Act* (SARA) (2002)
- *Fisheries Act* (2018)

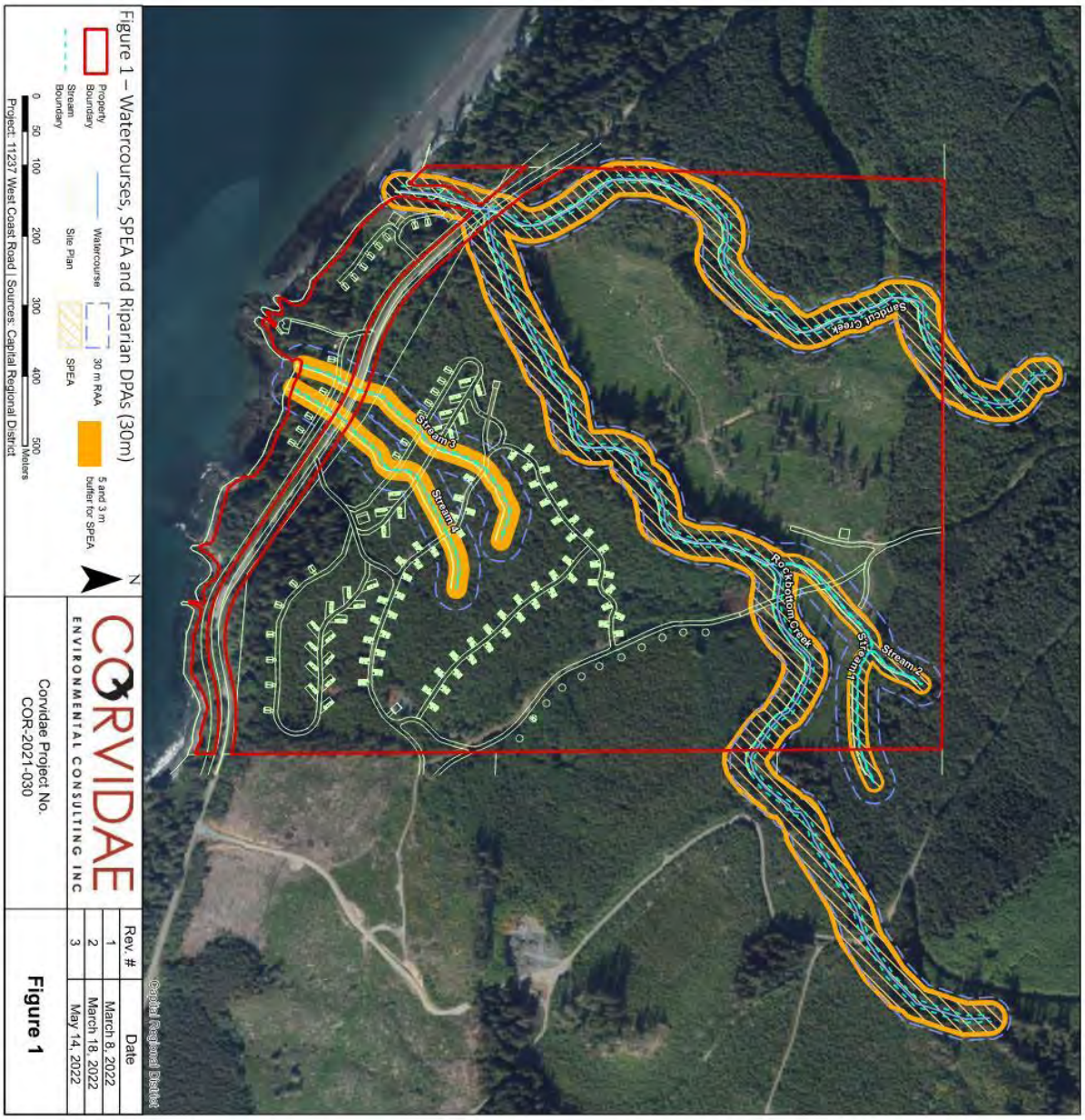


Figure 1 – Watercourses, SPEA and Riparian DPAs (30m)
Property Boundary
Stream Boundary
Watercourse
Site Plan
30 m RAA
SPEA
5 and 3 m buffer for SPEA
N
0 50 100 200 300 400 500 Meters
Project: 11237 West Coast Road | Sources: Capital Regional District
CORVIDAE
ENVIRONMENTAL CONSULTING INC
Corvidae Project No.
COR-2021-030
Figure 1
Rev. # Date
1 March 8, 2022
2 March 18, 2022
3 May 14, 2022
Sandcut Creek
Stream 3
Stream 1
Rockbottom Creek
Stream 2
Capital Regional District

2 SCOPE OF WORK

Corvidae completed an environmental assessment for the property. The environmental assessment documented the ecological features on the property including riparian areas and any sensitive species or ecosystems. Background information was reviewed, including applicable databases. During the assessment, the following features were documented in this report:

- Areas of sensitivity, habitat and biodiversity values;
- Plant communities and plant species on site;
- Potential wildlife presence and wildlife habitat;
- Soil properties and terrain; and
- Surface water flow patterns.

Following the field assessment, the biophysical features and cleared areas were mapped and buffer areas have been identified. Mitigations to minimize the impacts of the proposed residential development on the environment have been provided in Section 6.

3 METHODS

3.1 DESKTOP REVIEW

Baseline biophysical conditions were compiled by reviewing the best available data and information including existing reports for the area and conducting searches of online provincial and federal databases:

- BC Conservation Data Centre (BC CDC 2021a and 2021b);
- BC HabitatWizard (Province of BC 2021);
- Aerial photographs of the property (Google Earth 2021);
- CRD regional mapping system and database (CRD 2021), and
- Shirley-Jordan River Official Community Plan Bylaw No. 4001 (CRD 2018).

3.2 FIELD ASSESSMENT

A field assessment of the property was completed by a Qualified Environmental Professional (QEP) from Corvidae. The assessment included characterization of vegetation and habitat types, wildlife sign and species observations, wildlife habitat, and assessed the current conditions of the property.

The SPEAs for the streams on the property were calculated using the detailed assessment methodology in the RAPR Technical Manual (BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development 2019).

4 ENVIRONMENTAL SITE ASSESSMENT

Corvidae completed site visits on June 2, 16, August 4 and Sept 5, 2021. The property was assessed for any environmental concerns that may be present, including the riparian area of Sandcut Creek, Rockbottom Creek and the small seasonal streams on the property. Appendix B shows photos of the property and riparian areas.

4.1 CLIMATE AND BIOGEOCLIMATIC ZONE

The project is located within the Coastal Western Hemlock (CWH) biogeoclimatic zone, and specifically in the western variant of the Very Dry Maritime subzone (classified as CWHxm2; BC CDC 2019b). The CWHxm2 occurs from sea-level to 450m of elevation on southern Vancouver Island. The CWHxm2 has warm, dry summers and moist, mild winters with relatively little snowfall. Growing seasons are long and can experience water deficits.

It is a unique habitat that occurs on the central and southeastern section of Vancouver Island. The average rainfall is 1497.1 mm/annually (Sooke Lake North Station, Environmental Canada 2018).

4.2 TERRAIN AND SOILS

Soils in this biogeoclimatic zone are typically moderately deep Orthic Humo-Ferric Podzols with Hemimor humus forms (Pojar et al. 1991).

The soils on the site were a clay-loam and sandy-silty loam.

The topography of the property is varied. The property generally slopes from the highway (north side) towards the beach (south boundary of the property). Localized low areas occur where Sandcut Creek intersects the property, and where a drainage runs parallel to the highway and driveway, towards the beach. The existing house and cabin are both located on high areas, where rocky bluffs overhang the beach below. Areas north of West Coast Road generally slope in a south/southwest direction toward the roadway.

4.3 VEGETATION

The CWHxm2 is typically dominated by components of western hemlock (*Tsuga heterophylla*), Douglas-fir (*Pseudotsuga menziesii*) and western red cedar (*Thuja plicata*) (Pojar et al. 1991). Salal (*Gaultheria shallon*), dull Oregon-grape (*Mahonia nervosa*), and red huckleberry (*Vaccinium parvifolium*) typify the poorly to moderately developed shrub layer. Oregon beaked moss (*Kindbergia oregana*), step moss (*Hylocomium splenden*), lanky moss (*Rhytidiadelphus loreus*), and flat moss (*Plagiothecium undulatum*) dominate the well-developed moss layer (Pojar et al. 1991).

There are two types of ecosystems on the property: dry mature forest and riparian forest.

- The dry mature forests are dominated by Douglas-fir, with a shrubby understory that includes salal and oceanspray.
- Adjacent to the streams, and in localized areas with concentrated moisture in the soil, forests contain more bigleaf maple, red alder western hemlock, and western redcedar. The understory in riparian areas is dominated by salmonberry and sword fern.

During the site assessment the species in Table 1 were found on the site. Six invasive species were observed on the site: bull thistle, Canada thistle, English holly, Himalayan blackberry, scotch broom and spurge laurel. Measures to remove and prevent invasive species are discussed in Section 6 of this report.

During the site assessment the species in Table 1 were found on the site.

Table 1. Plant species observed on site during field visit in 2021

Common Name	Scientific Name	BC Provincial Status[1]	*SARA* Schedule 1 Status[2]
Black twinberry	*Lonicera involucrata* var. *involucrata*	Yellow	–
Bracken fern	*Pteridium aquilinum*	Yellow	–
Bull thistle	*Cirsium vulgare*	**Invasive**; Exotic	–
Canada goldenrod	*Solidago canadensis*	Exotic	–
Canada thistle	*Cirsium arvense*	**Invasive**; Exotic	–
Coastal leafy moss	*Plagiomnium insigne*	Yellow	–
Coastal strawberry	*Fragaria chiloensis*	Yellow	–
Common horsetail	*Equisetum arvense*	Yellow	–
Common rush	*Juncus effusus*	Yellow	–
Douglas-fir	*Pseudotsuga menziesii*	Yellow	–
English holly	*Ilex aquifolium*	**Invasive**; Exotic	–
Foxglove	*Digitalis purpurea*	Exotic	–
Goatsbeard	*Aruncus dioicus* var. *acuminatus*	Yellow	–
Hairy cat's-ear	*Hypochaeris radicata*	Exotic	–
Himalayan blackberry	*Rubus armeniacus*	**Invasive**; Exotic	–
Maidenhair fern	*Adiantum aleuticum*	Yellow	–
Oregon-beaked moss	*Kinbergia oregana*	Yellow	–
Pacific sanicle	*Sanicula crassicaulis*	Yellow	–
Palm tree moss	Leucolepis acanthoneuron	Yellow	–
Pearly everlasting	*Anaphalis margaritacea*	Yellow	–
Red alder	*Alnus rubra*	Yellow	–
Red elderberry	*Sambucus racemosa*	Yellow	–
Red huckleberry	*Vaccinium parvifolium*	Yellow	–
Salal	*Gaultheria shallon*	Yellow	–
Salmonberry	*Rubus spectabilis*	Yellow	–
Scotch broom	*Cytisus scoparius*	**Invasive**; Exotic	–
Slough sedge	*Carex obnupta*	Yellow	–
Snowberry	*Symphoricarpos albus*	Yellow	–
Spurge laurel	*Daphne laureola*	**Invasive**; Exotic	–
Step moss	Hylocomium splendens	Yellow	–
Sword fern	*Polystichum munitum*	Yellow	–
Thimbleberry	*Rubus parviflorus*	Yellow	–
Trailing blackberry	*Rubus ursinus*	Yellow	–
Trembling aspen	*Populus tremuloides*	Yellow	–
Wall lettuce	*Mycelis muralis*	Exotic	–

Common Name	Scientific Name	BC Provincial Status[1]	*SARA* Schedule 1 Status[2]
Western hemlock	*Tsuga heterophylla*	Yellow	--
Western redcedar	*Thuja plicata*	Yellow	--
Willowherb	*Epilobium* sp.	--	--

[1] BC CDC 2021a
[2] Government of Canada 2021

4.4 WILDLIFE

The habitat is found in the Coastal Western Hemlock biogeoclimatic zone is home to many wildlife species. Black-tailed deer, black bear, marten, and gray wolf are the most common large mammals in this zone on Vancouver Island. For bird species in this zone, the following typically occur: great horned owl, barred owl, ruffed grouse, band-tailed pigeon, northern flicker, hairy woodpecker, common raven, Steller's jay, chestnut-backed chickadee, red-breasted nuthatch, varied thrush, red-tailed hawk, Townsend's warbler. The following amphibians may occur in this biogeoclimatic zone: western toad, Pacific treefrog, western redbacked salamander (Pojar et al. 1991).

The forest on the property is home to a variety of birds, mammals, reptiles and amphibians. Mature trees provide nesting and roosting habitat for songbirds, owls and woodpeckers. Large and small coarse woody debris provide cover habitat for small mammals, snakes and amphibians. No suitable amphibian breeding habitat was observed on the site; however, amphibians were observed using terrestrial habitat adjacent to the streams. During the site assessment the species in Table 2 were found on the site.

Table 2. Wildlife Species observed on site during field visits in 2021

Common Name	Scientific Name	BC Provincial Status[1]	*SARA* Schedule 1 Status[2]
American black bear (scat)	*Ursus americanus*	Yellow	–
American robin	*Turdus migratorius*	Yellow	–
Bald eagle	*Haliaeetus leucocephalus*	Yellow	–
Black-tailed deer (scat)	*Odocoileus hemionus*	Yellow	–
Chestnut-backed chickadee	*Poecile rufescens*	Yellow	–
Common raven	*Corvus corax*	Yellow	–
Dark-eyed junco	*Junco hyemalis*	Yellow	–
Pacific wren	*Troglodytes pacificus*	Yellow	–
Red squirrel	*Tamiasciurus hudsonicus*	Yellow	–
Red-breasted nuthatch	*Sitta canadensis*	Yellow	–
Varied thrush	*Ixoreus naevius*	Yellow	–

[1] BC CDC 2021a
[2] Government of Canada 2021

4.5 SPECIES AT RISK

A query of the BC CDC iMap tool yielded no occurrences of species at risk within a two-kilometer radius of the property (Figure 2; BC CDC 2019). One record exists in the Jordan River area: red-legged frog

(*Rana aurora*; approximately 2.4 km from the property). This species was observed on the property during the site visits for this assessment.

CRITICAL HABITAT

Marbled Murrelet

Critical habitat for marbled murrelet has been mapped adjacent to nearby Desolation Creek in Jordan River Regional Park (approximately 1.3 km northwest the property). The mapping for the critical habitat for this species is based on a 2002 model using the biophysical attributes of nesting habitat. Suitable nesting habitat may be found in complex old growth stands (140+ years old) at 0-600m of elevation and within 50km of saltwater. Nest trees within suitable habitat are generally >30m tall with large mossy nest platforms on large upper limbs that are still protected by the canopy.

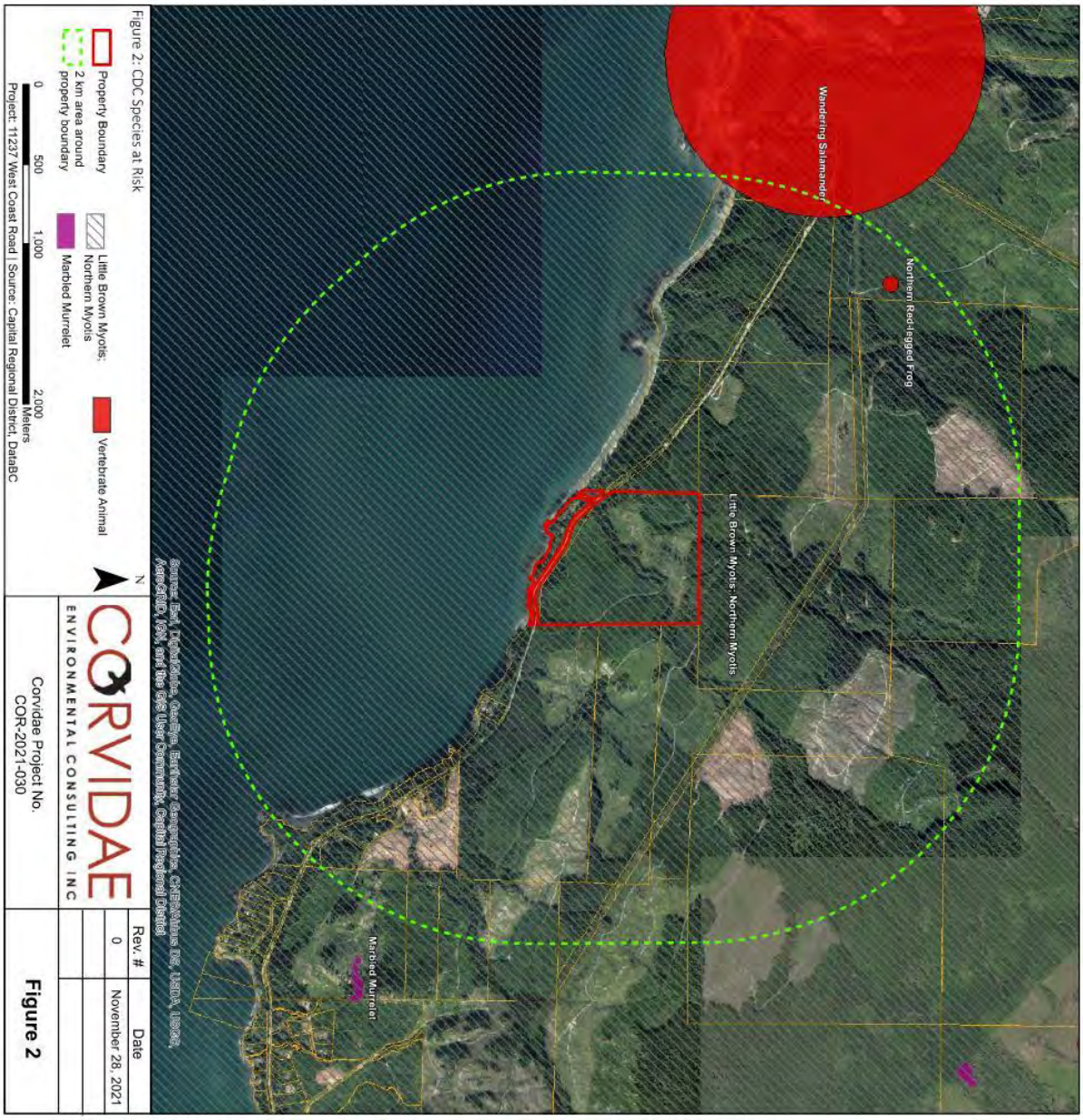
As the property has been historically logged, suitable stands are unlikely to occur. Veteran trees on the property may have the attributes of a suitable nest tree, but their exposure and isolation would likely reduce the probability of use by nesting murrelets.

Bats

A 50 km grid square of critical habitat for *Myotis lucifugus* and *Myotis septentrionalis* (Little Brown Myotis and Northern Myotis) overlaps the property.

Note, critical habitat mapping is done at a high level to indicate areas in which the biophysical attributes of critical habitat are known to or may occur. For example, the 50 km^2 polygon for bats contains a known occurrence of the species and therefore, it is assumed that additional populations may occur in suitable habitat. Painted turtles are known to travel within aquatic ecosystems connected to known locations and may occur up to 150m from the water.

During the field visit, no suitable roosting habitat was observed for bats (old growth snags or rock crevasses).


Wandering Salamander
Northern Red-legged Frog
Little Brown Myotis; Northern Myotis
Marbled Murrelet
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Capital Regional District
Figure 2: CDC Species at Risk
Property Boundary
2 km area around property boundary
Little Brown Myotis; Northern Myotis
Marbled Murrelet
Vertebrate Animal
N
0 500 1,000 2,000 Meters
Project: 11237 West Coast Road | Source: Capital Regional District, DataBC
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Corvidae Project No.
COR-2021-030
Rev. # Date
0 November 28, 2021
Figure 2

4.6 RIPARIAN AREAS AND FISHERIES

The property is intersected at the west end by Sandcut Creek (Figure 1). Sandcut Creek, joined by Rockbottom Creek, passes under a highway bridge and flows south into the Juan de Fuca Strait. North of the bridge, and at the bridge location, the creek is within a steep-sided gully. South of the bridge, the creek widens. The western streambank remains very steep to the shoreline. The eastern streambank is relatively flat, varying from approximately 1 to 5 degrees of slope.

South of the bridge, Sandcut Creek has a rock bed, with pools and channels cut into the bedrock (Photo 9 and 11). Several small steps and waterfalls occur in this stretch of the creek (Photo 10). The creek ends with a waterfall over the rocks to the cobble beach. The waterfall, approximately 2-3 m tall, serves as a complete barrier to fish passage.

A search of the BC HabitatWizard (Province of British Columbia 2018) confirmed a lack of fish records in Sandcut Creek and Rockbottom Creek (Figure 4). The search revealed a number of records in neighbouring streams, including Desolation Creek and Jordan River to the west: cutthroat trout (anadromous; *Onchorynchus clarki clarkii*), Coho salmon (*Oncorhynchus kisutch*), steelhead salmon (*Oncorhynchus mykiss*) and rainbow trout (*Oncorhynchus mykiss*).

Several tributaries to Rockbottom Creek occur on the property. These are relatively narrow streams (0.5m to 2m width) with rock and cobble bottoms and a cascade-pool structure. Two additional small streams originate on the property and are culverted under the highway, emptying into the ocean.

An additional drainage is present in the middle section of the property to the west of the highway. The drainage appears to begin from the side of the driveway and continues through a low area between the highway and the central (cleared) part of the property, ending in a marshy depression near the shoreline, but not connected due to the beach structure. The watercourse is channelized intermittently, with saturated wet areas in between (Photo 12). This watercourse is isolated from any other watercourses and the ocean, and therefore is not eligible under the RAPR.

The calculated SPEAs for Sandcut and Rockbottom Creeks vary from 15-30m, depending on the shade zone of sensitivity and the stream direction. The SPEAs on the tributaries are all 10m either side of the stream.

In addition to the SPEA, a 3-5m windthrow/tree protection zone buffer is added outside the SPEA in order to protect the integrity of the SPEA (Figure 3). This additional protection is required by the RAPR.

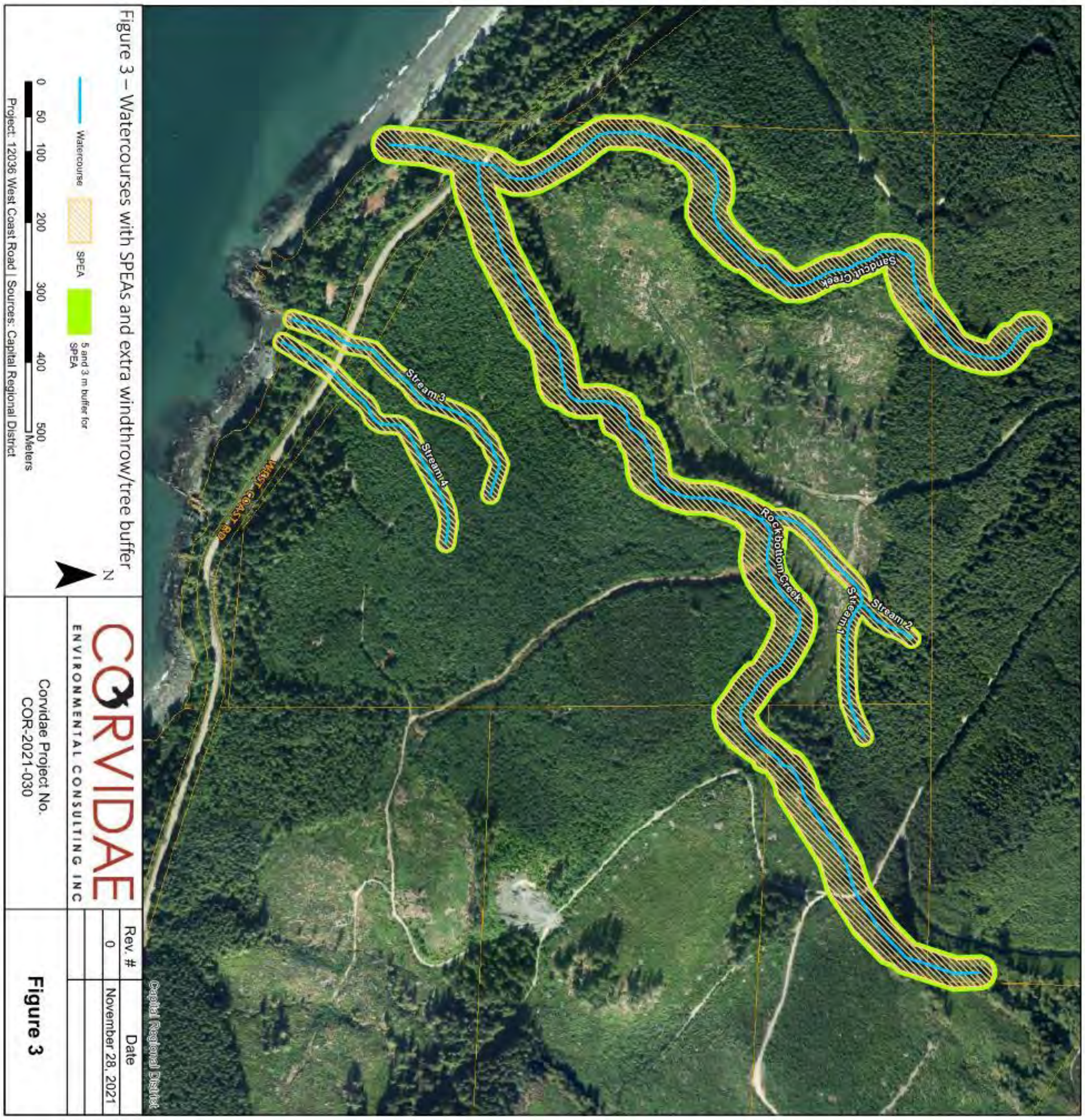
Figure 3 – Watercourses with SPEAs and extra windthrow/tree buffer
Watercourse
SPEA
5 and 3 m buffer for SPEA
0 50 100 200 300 400 500 Meters
Project: 12036 West Coast Road | Sources: Capital Regional District
N
CORVIDAE
ENVIRONMENTAL CONSULTING INC
Corvidae Project No.
COR-2021-030
Rev. #
Date
0
November 28, 2021
Figure 3
Sandcut Creek
Stream 3
Stream 4
Rockbottom Creek
Stream 1
Stream 2
Capital Regional District

5 POTENTIAL ENVIRONMENTAL EFFECTS

The potential impacts of the proposed development of the property on the environment are:

- Impacts on sensitive ecosystem areas such as riparian habitat,
- Loss of existing vegetation and spread of invasive plant species,
- Change in wildlife habitat availability and wildlife mortality risk, and
- Erosion and sediment transport within and around the project area.

The residual environmental impacts of the activities on the property will be reduced by the implementation of the mitigation and restoration measures recommended in Section 6 of this report.

VEGETATION

The effects of tree removal may include loss of biodiversity of plant species and increased susceptibility to invasive plants not only in the cleared area but also in adjacent plant communities. Vegetation immediately adjacent to cleared areas may experience in changes to the canopy structure and understory plant species due windthrow and increased light and moisture penetration.

INVASIVE SPECIES

Invasive plants are particularly adept at colonizing degraded plant communities and disturbed soils in high traffic areas, such as the margins of roads and parking areas. Invasive plants establish readily in disturbed areas as they have a wide ecological tolerance and grow and propagate quickly. The effects of invasive plant establishment may be the reduction or displacement native species by capturing resources and occupying habitats.

WILDLIFE AND WILDLIFE HABITAT

Habitat loss and alteration from vegetation clearing can cause displacement of wildlife, use of less suitable habitat, reduced foraging ability, increased energy expenditure and lower reproductive success. Reduced habitat effectiveness can occur as a result from the creation of habitat edges and the introduction of buildings with many windows into previously unused spaces can increase mortality risk for birds.

AQUATIC ENVIRONMENT

Vegetation in the foreshore area controls surface water run-off from the upland areas, preventing excessive silt and surface run-off pollution from entering the aquatic environment. Increased levels of sediment and turbidity can impact the productivity of aquatic ecosystems. Sediment in the water may change the amount of light reaching aquatic plants, thereby negatively impacting growth. Sediment has both lethal and sublethal impacts on fish. Aside from direct mortality from suffocation, sediment in the water may limit visual feeding, change fish behaviour, and reduce egg and embryo survival.

RIPARIAN ENVIRONMENT

The removal of vegetation in the riparian area may result in the loss of features, functions and conditions that are vital for maintaining bank stability and fish habitat conditions. Vegetation in the riparian area controls surface water run-off from the upland areas, preventing excessive silt and surface run-off pollution from entering the aquatic environment. Vegetation removal for the project will only occur outside of the SPEA and tree protection zones.

EROSION AND SEDIMENT

Removal of vegetation and ground disturbance may expose soils to erosion and can result in the movement of sediment on the property. Damage or degradation of soil surfaces during construction can include loss of soil structure, increased erosion, and soil compaction which can negatively affect post-construction reclamation efforts.

6 RECOMMENDED ENVIRONMENTAL PROTECTION MEASURES

The mitigation measures provided in this report are designed to protect sensitive ecosystems and were developed in accordance with:

- Procedures for Mitigating Impacts on Environmental Values (Environmental Mitigation Procedures) (BC Ministry of Environment [MOE] 2014a),
- Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia (Government of BC 2014),
- Environmental Best Management Practices for Urban and Rural Land Development in British Columbia (BC Ministry of Water, Land and Air Protection 2004), and
- RAPR Technical Manual (BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development 2019).

RIPARIAN ENVIRONMENT

No clearing of vegetation or trees, or disturbance of any kind shall occur within the SPEAs; and recommended no tree clearing in the windthrow and TPZ buffer. Danger trees within the buffers must be assessed by a certified arborist and removed under supervision of a QEP to ensure no damage is done to the SPEA.

VEGETATION

Areas disturbed by development that are not part of the permanent road or facilities footprint should be replanted with native trees and shrubs and/or seeded with native seed mix (Table 3). Overall plant density should be approximately one plant per 1 to 2 m^2.

Table 3. Recommended native vegetation to plant in disturbed area

Common Name	Species
Salal	*Gaultheria shallon*
Salmonberry	*Rubus spectabilis*
Nootka rose	*Rosa nutkana*
Oceanspray	*Holodiscus discolor*
Sword fern	*Polystichum munitum*
Western redcedar	*Thuja plicata*
Bigleaf maple	*Acer macrophyllum*
Coastal Revegetation Mix by Pacific Premier or equivalent	

*shrubs and ferns should be at least 1 gallon size; trees should be 3 gallon size at minimum pending availability

INVASIVE SPECIES

Invasive weed control is difficult for established populations. Immediate eradication of new and existing infestations should be a high priority during any maintenance and re-development of the lake shoreline area. Species should be removed using the most appropriate methods, at the correct time of year, and plant material must be disposed of correctly (burned or bagged and disposed of properly in a landfill) to avoid re-establishment or spread. Following removal, re-seed bare soil with desirable, competing vegetation. Chemical control is not recommended due to the sensitive aquatic ecosystems on the property.

Table 4. Removal and disposal methods for invasive species

Species	Removal Method	Removal Timing	Plant Disposal
Bull thistle	Regular cutting or pulling can help wear down plant reserves, reduce plant growth, and reduce populations, but is not likely to eradicate the species.	Cutting and pulling are best done before flowering to eliminate seed production.	If plants are cut prior to flowering, the plant material can be left on the site to decompose. If plants are cut post flowering, all plant parts, including flower heads, should be bagged and disposed of properly in a landfill.
Canada thistle	Regular cutting or pulling can help wear down plant reserves, reduce plant growth, and reduce populations, but is not likely to eradicate the species.	Cutting and pulling are best done before flowering to eliminate seed production.	If plants are cut prior to flowering, the plant material can be left on the site to decompose. If plants are cut post flowering, all plant parts, including flower heads, should be bagged and disposed of properly in a landfill.
English holly	English holly can be removed by hand pulling small seedlings or cutting mature trees at ground level removing all plant material.	Removal is best done before flowering to eliminate seed production.	Holly does not root again once removed, so it can also be piled to desiccate on site. Can be bagged and disposed of properly in a landfill. Do not compost.
English ivy	Can be removed by hand pulling and cutting of vines. Roots should be pulled so no rooted portions re-grow.	Removal should occur fall, when plants are easier to remove due to moist soil conditions.	Bagged and disposed of properly in a landfill. Do not compost.

Species	Removal Method	Removal Timing	Plant Disposal
Himalayan blackberry	Can be removed by pulling or cutting the canes from the ground. If possible, dig out the roots, paying careful attention not to damage nearby vegetation.	Removal should occur in the spring and early summer before they produce berries as canes that are cut as the plant is producing flowers are least likely to re-sprout.	Burned or bagged and disposed of properly in a landfill. Do not compost.
Scotch broom	Avoid disturbing the soil which can stimulate dormant broom seeds to sprout. Small broom plants can be pulled easily from the ground by hand without disturbing the soil. Larger plants should be cut below the root crown using loppers or a pruning saw.	Scotch broom removal should occur mid-April through early June before its seed pods begin to open.	Bagged and disposed of properly in a landfill. Do not 'recycle' garden debris or compost.
Spurge laurel	Spurge laurel can be removed by pulling small plants or cutting larger plants just below the soil. Spurge laurel stems may re-sprout after cutting and numerous seedlings may germinate so repeated site visits are necessary. Always wear gloves when handling spurge laurel because it produces a noxious substance which can cause severe eye and skin irritation. Avoid spreading berries during removal.	Can be removed year-round.	Removed plants should be bagged and disposed of properly in a landfill. Do no transport inside an enclosed vehicle as the plants can cause respiratory irritation.

WILDLIFE AND WILDLIFE HABITAT

The following measures should be taken to minimize impacts on wildlife and wildlife habitat:

- Clearing of existing vegetation, including tree cutting, brushing, or clearing and grubbing, should occur outside of the sensitive time period for breeding and nesting birds (mid-March to end of August; Government of Canada 2021b). If disturbance of vegetation is to occur within this time period, then a QEP must perform a nesting bird survey to identify any nesting birds that may be potentially impacted by the project. The survey must be completed within 5 days of the planned clearing/disturbance, and the results are valid for 5 days. If nesting bird activity is detected, then the QEP will recommend the appropriate mitigation, such as protective buffers or delay of clearing until nesting activity is complete.
- Where suitable and safe, retain habitat that provides shelter for wildlife, such as standing dead trees and rocky outcrops.
- In the event that an amphibian or reptile is encountered during clearing or construction, the QEP will recommend the appropriate mitigation, such as avoidance or relocation. All salvage must be done by the QEP and with the appropriate wildlife permit.

- A raptor nest survey should be completed prior to development activities. A QEP must perform a multi-visit nest survey to identify any nests that may be potentially impacted by the project. If nesting raptor activity is detected, then the QEP will recommend the appropriate mitigation, such as protective buffers.

EROSION AND SEDIMENT CONTROL

The primary focus of erosion and sediment control planning is erosion control; if there is no erosion then there is no sediment. Erosion control is far more cost effective to implement and manage than sediment control.

Erosion controls, including the recommendations listed below, are recommended to be maintained for the duration of the project.

- Install a silt fence barrier outside of the SPEA edge and tree protection zones between the building site and the construction area to prevent sediment laden runoff from entering the wetland.
- Store materials and soils in dry, flat areas at least 15m outside the edge of the SPEA.
- Revegetation of disturbed areas adjacent to the SPEA should be undertaken upon the completion of construction or disturbance. Prevent erosion and invasive plant colonization by planting native species of shrubs and trees (see Table 3), which naturally have deep roots to aid in soil stabilization, compete against weeds and do not require irrigation.
- Heed weather advisories and scheduling work to avoid wet and rainy periods that may result in high surface water flow volumes and/ or increase erosion and sedimentation.
- Regularly monitor the aquatic environment for signs of sedimentation during all phases of the work, undertaking or activity and taking corrective action if required.

7 CONCLUSION

The observations from the site visits to the property have been detailed in this report. No permanent habitat features (e.g., bat roosts in rocky outcrops, raptor stick nests) were observed.

Subsequent field visits should be completed to update the biophysical observations and RAPR report as needed for each phase of the development planning (i.e., following the rezoning, future development permits).

During the development at 11237 West Coast Road, implementation of the mitigation measures recommended in this report, including the protection of the riparian area and revegetation of cleared areas to prevent invasive species, will minimize the impacts of the proposed development on the environment.

Report Prepared By:

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APPENDIX A – SITE PHOTOGRAPHS

Photo 1. Sandcut Creek south of West Coast Road (Hwy 14). June 2021.

Photo 2. Rockbottom Creek near the northern edge of the property. September 2021.

Photo 3. Typical mature riparian forest adjacent to Sandcut and Rockbottom Creeks. September 2021.

Photo 4. Cleared area adjacent to riparian DPA for Rockbottom Creek. September 2021.

Photo 5. Cleared area and new/improved roads on the property. September 2021.

Photo 6. Stream 1 (tributary to Rockbottom Creek) in old clearcut near the northern edge of the property. September 2021.

Photo 7. Stream 3 in the centre of the property to the northeast of Hwy 14. September 2021.

Photo 8. Stream 2 near top of property. June 2021.

Photo 9. Stream 3 adjacent to old road. June 2021.

Photo 10. Representative photo of the middle section of stream 1. June 2021.

Photo 11. Stream 6 adjacent to old road. August 2021.

Photo 12. View looking south at the existing road from the north end of the property. August 2021.

2. Geotechnical Report, July 24, 2023 - RZ000280

RYZUK GEOTECHNICAL
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July 24, 2023
File No: 9892-2

Sandcut Properties and Developments Ltd.
[redacted]
Redacted: Pursuant to Section 22 of British Columbia's *Freedom of Information and Privacy Protection Act.*

Attn: [redacted]

Re: Proposed Campground/Resort
11237 West Coast Rd – Port Renfrew, BC

As requested, we attended the above referenced site on June 1, 2023, to carry out a visual geotechnical assessment. We understand it is proposed to construct a campground and resort within the two properties to the north and south of West Coast Road. The site is located within the Capital Regional District, who have requested a geohazard assessment. This assessment has been prepared as per the safe building construction criterion as set out in Section 56 of the Community Charter and in consideration of a seismic event with a 2% return probability of exceedance in 50 years (1 in 2,475 years) for permanent structures. Contained herein are our associated observations, comments, recommendations related to the potential for geotechnical hazards. Our work has been carried out in accordance with, and is subject to, the attached Terms of Engagement.

1.0 PROPOSED DEVELOPMENT

We understand it is proposed to consolidate two properties located to the north and south of West Coast Road and rezone to Rural Commercial Recreation (Campground) CR-2 Zone. The campground will consist of sixty-one (61) tent campsites, twenty-three (23) RV campsites, twenty-seven (27) A-Frame cottages, elven (11) cabins, a general store/caretaker residence, a workshop, a shop, a pumphouse/showers, a septic field, potable and non-potable water lines, a bridge, and associated road access.

2.0 SITE DESCRIPTION

The proposed development is roughly rectangular in shape with a total area of approximately 78 hectares. The development is bounded to the north, east, and west by cutblocks, and to the south by Salish Sea. The southern property contains a single family residence, a cabin, a power shed/water tank, and associated road access. The northern property is a old cutblock which contains several logging roads and various temporary structures.

The proposed development terrain generally slopes down from the northeast to southwest, with an approximate total relief of 116 m. Generally, the slopes ranged from 5 to 20 degrees below horizontal with the exception of the creek banks and foreshore area. A total of four (4) creeks are present within the development, that being Sandcut Creek, Rockbottom Creek, and two (2) unnamed creeks. Sandcut and Rockbottom Creeks intersect the development at the north and west property lines, respectively, and extend to the southwest corner of the property where they meet near West Coast Road and outfall approximately 100 m south into the Salish Sea, west of several proposed A-Frame cottages. Sandcut and Rockbottom bank slopes range from 25 degrees below horizontal to vertical where bedrock is exposed and are up to 14 m in height. Two minor seasonal unnamed creeks originate within the center of campground development and extend to the southwest where they outfall into the Salish Sea, to the east of the existing single family residence. The catchment for the seasonal creeks is generally contained within the are of the proposed campground. The bank slopes of the unnamed creeks are between 20 and 35 degrees below horizontal with heights of up to 6 m. The foreshore slopes ranged from 27 degrees below horizontal to vertical where bedrock was exposed. The foreshore ranges from 3 m to 16 m in relief. Finally, a draw is present within the foreshore area south of West Coast Road between the western group of proposed A-Frame cottages and the existing family residence. The banks of the draw slope 35 degrees below horizontal and have a height of approximately 8 m in height. It appears a road was previously constructed at the southern portion of the draw down to the beach.

Vegetation throughout the proposed development ranged from a logged cutblock to mature trees. The areas adjacent to West Coast Road, Sandcut Creek, and Rockbottom Creek contained mature trees with very thick brush/undergrowth. The area between Sandcut Creek and Rockbottom Creek appears to have been logged within the last 8 years. Vegetation within this area consists of thick brush, sporadic mature trees within the central portion, and recently planted trees. The areas to the west and east of the creeks were previously logged and appear to have been replanted within the last 20 years. The area consists of thick immature trees with varying undergrowth.

We note that we did not traverse the entire proposed development, just the areas where campground/resort is proposed. Further, due to this thick undergrowth in the foreshore area to the east of the existing family residence, we were unable to properly visually assess the slopes where the five (5) A-Frame cottages are proposed.

We have attached a Location Plan for reference of terrain, creek locations, vegetation, and proposed campground/resort structures.

3.0 GEOLOGY

During our site attendance we observed bedrock and soil were exposed throughout the proposed development. Based on our observations, soil generally observed consisted of varying amounts of topsoil/organics atop, native brown stiff silty clay to dense sandy gravel with varying cobble content atop bedrock. Bedrock was exposed throughout the foreshore area and consisted of massive sandstone of the Sooke Formation at the southwest corner of the development. The sandstone was observed within the creek banks in the northwest corner of the development where the bridge is proposed. The remainder of the exposed bedrock within the foreshore area is from the Metchosin Volcanics consisting of massive basalt with a brecciated layer atop. Further, basalt was also observed within various outcrops in the northeastern portion of the development.

4.0 GEOTECHINCAL ASSESSMENT

Our visual assessment indicates no hazards are present to the proposed structures located within the northern property. We consider all the permeant and temporary structures proposed within the northern property to be sufficiently offset from Rockbottom Creek for no flood or debris flow hazard to be present, with the possible exception of the proposed bridge. From review of Google Earth, the average creek channel gradient above the proposed bridge location is approximately 8 degrees below horizontal, which is considered to be a depositional environment, however further assessment of the bridge abutments is required. Once the bridge abutment locations and deck height are finalized, we can traverse Rockbottom Creek to assess if a flood or debris flow hazard is present and review the banks for slope stability. Depending on our visual assessment, a subsurface investigation, slope stability analysis, and/or flood analysis may be required.

At this time, the A-Frame cottages proposed in the southwest corner of the development are generally considered to have no hazards present, with the exception of the three (3) east most and two (2) west most cottages. Based on the supplied drawings, our review of aerial imagery, and contours from LiDAR mapping, the east most proposed cottages are adjacent to the crest of the previously mentioned draw in the foreshore area. Once the Cottage locations have been finalized and survey/staked in the field, we will be able to visually assess offsets from the crest of the slopes to determine if potential landslide hazard is present, or if a subsurface investigation and slope stability analysis is required.

The two west most A-Frame cottages are adjacent to the crest of the east Sandcut Creek bank. From review of LiDAR contours the proposed cottages are approximately 4 to 6 m above the channel base. Review of Google Earth indicates the average channel gradient upstream to be less than 10 degrees below horizontal. However, once location have been finalized a review of the creeks upstream to determine if a debris flow hazard is present will need to be carried out. At this

time a flood analysis has not been conducted. This may need to be carried out once cottage locations have been established.

As noted above, due to the thick vegetation at the proposed A- Frame cottages east of the existing single family residence, we were unable to properly visually assess the area. From review of the supplied Site Plan, aerial imagery, and LiDAR contour mapping, we consider the east four (4) cottages may be at risk of landslide and depending on the finalized location of the western most cottage, it may also be at risk. If these cottages are desired to be constructed further assessment will be required. Assessment will require survey/layout of structure locations to determine proximity to slope crest, a subsurface investigation to confirm soils, soil competency, and depth to bedrock. Based on the investigation results a slope stability analysis may be required.

5.0 RECOMMENDATIONS

We consider the proposed building sites in the northern property and the three (3) middle A-Frame cottages in the southern property to be feasible for the proposed structures. We consider the native brown stiff silty clay to dense sandy gravel with varying cobble content, bedrock, or approved select engineered backfill atop such, will be capable of providing stable long term support to the foundation elements of the A-Frame cottages, cabins, a general store/caretaker residence, a workshop, a shop, a pumphouse/showers considering an allowable design bearing resistance of 150 kPa (SLS). All foundation preparations should be inspected by a qualified professional and construction should be conformant with the BC Building Code.

We consider the placement of engineered fill to raise the existing grade for the proposed structures to be feasible. Engineered fill should consist of approved select granular material. Engineered fill for foundation support must be placed and compacted atop approved subgrade. Fill is to be compacted to a minimum of 95% Standard Proctor Maximum Dry Density (SPMDD). Engineered fill must extend beyond the footing edges be an amount equal to at least the depth of fill placed, to provide adequate splay. Final slope orientation will be dependent on material selection, such can be reviewed when material is known.

For road access construction, we consider that the placement of fill material may be undertaken without any adverse effect on slope stability. We do not anticipate significant production of sediment, however, simple remediation such as silt fencing may be installed down slope to intercept any sediment produced during construction. In addition, we recommend to revegetate the areas disturbed during construction and that all finished slopes should be shaped as flat as possible given the sites sloping conditions.

As stated above, further assessment of the proposed bridge and noted A-Frame cottages located in the north and south properties, respectively, will be required to determine if a landslide, flood, or debris flow hazards are present.

6.0 CLOSURE

Given the above and our understanding of the proposed development, and provided our recommendations are followed, we consider the proposed structures in the northern property to be feasible from a geotechnical perspective, and that the land may be used safely for the use intended, namely for proposed single family residential construction which is completed in accordance with the BC Building Code, pursuant to Section 56 of the Community Charter. Our assessment considers a design seismic occurrence with a 2% probability of exceedance in 50 years, in accordance with the current BC Building Code.

We trust the above is suitable for your current requirements. Please contact us if you have any questions or concerns.

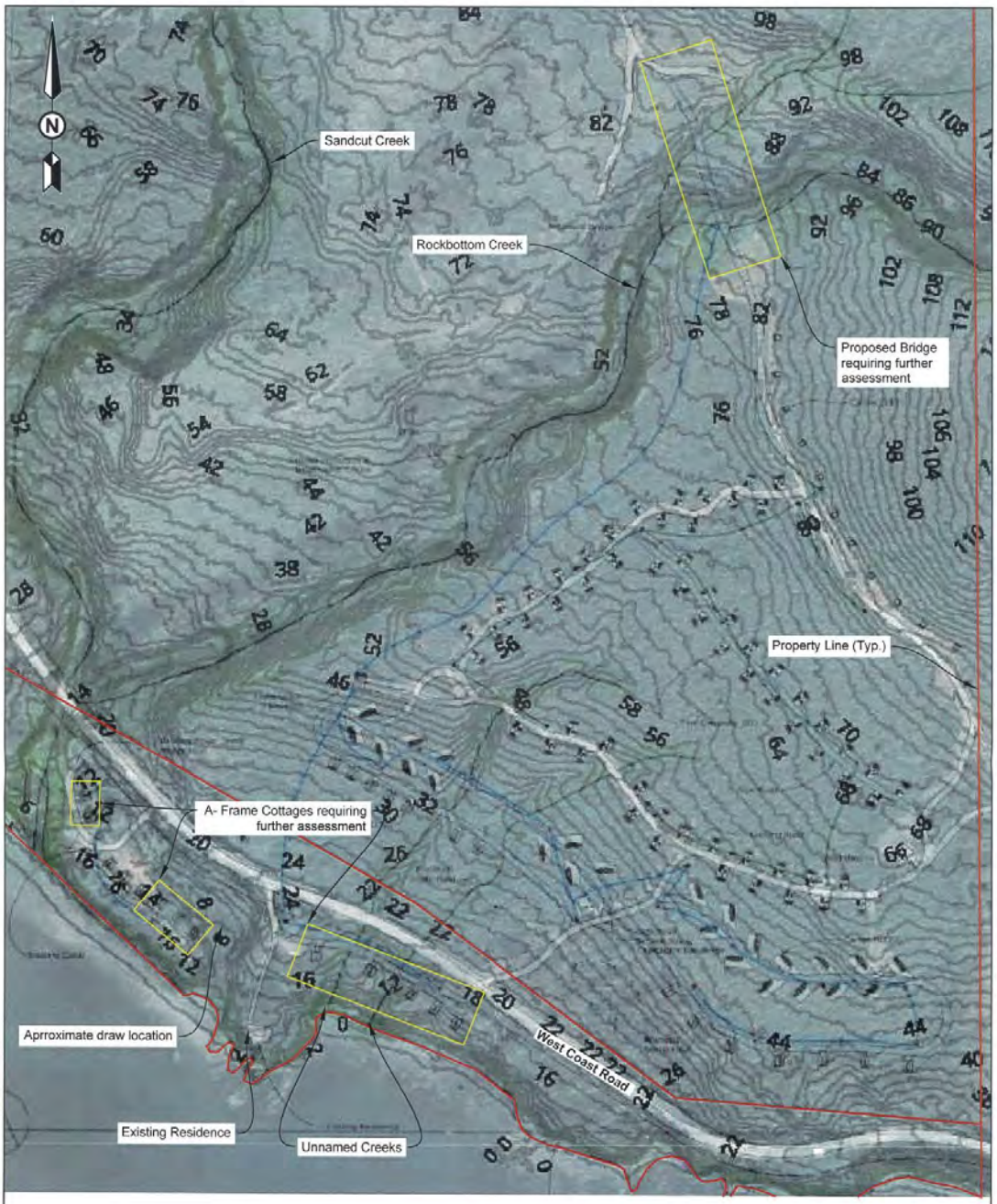
Yours very truly,
Ryzuk Geotechnical

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA S. D. JONES # 51945 24/07/23

Simon Jones, P.Eng.
Intermediate Engineer PEO 1002946

Scott Currie, P.Eng.
Senior Engineer

Attachments: Terms of Engagement
Location Plan



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NOTES
1. This drawing is scaled for 11x17 sheet and does not require further scaling to fit. Scales will differ if printed on different sheet size.
2. Base plan taken from Knot in a Box drawing titled "11237 West Coast Road" Sheet 01, dated 2022/11/01.
3. Contours from LiDAR BC, 2019.

REV.	DESCRIPTION	YY/MM/DD	DRAWN BY
0	ISSUED WITH REPORT	23/07/24	SDJ

SEAL

PTPN: 1002996

PROJECT No.	9892-2
DRAWN	SDJ
REVIEW	RSC
SCALE	1:3000
SHEET No.	01 of 01
CLIENT	Sandcut Properties and Developments Ltd.
PROJECT TITLE	Proposed Campground/Resort
PROJECT ADDRESS	11237 West Coast Road - Port Renfrew, BC
DRAWING PACKAGE	
SHEET NAME	LOCATION PLAN

Strathcona Forestry Consulting

Sandcut Resort Proposal

Wildfire Hazard Assessment

Redacted: Pursuant to Section 22 of British Columbia's *Freedom of Information and Privacy Protection Act.*

Prepared for: [redacted]

Prepared by: Strathcona Forestry Consulting
PO Box 387 Stn Mn
Duncan BC V9L 3X5

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2 June 2021

1

Executive Summary

In accordance with the Capital Regional District's Development Permit guidelines for Wildfire, Sandcut Properties and Developments Ltd. retained Strathcona Forestry Consulting to conduct a wildfire hazard assessment of the "Sandcut" property at 11237 West Coast Road.

Results of the assessments determined that the wildfire threat at the site is currently High. Current contributing factors include: continuity and extent of fuel (forest vegetation) loading at the site and in the general area, intermix (> 1 structure/ha), current HeadFire Intensity > 2000 kw/M, lack of currently developed access and fireflow, and potential for delayed response. Additionally, the Highway 14 corridor is designated a high risk wildfire interface zone by the British Columbia Wildfire Service. Under the provincial Wildfire Threat Rating system, ratings must be moderate or less to be considered acceptable.

Living in a fire-prone ecosystem involves taking the necessary steps to protect homes, property, and community from wildfire. Development standards play a significant role in reducing the potential impact a wildfire will have on an area (FireSmartCanada.ca; FireSmartBC.ca). This report outlines FireSmart recommendations for vegetation management, access improvements, provision of water sources, and construction options. In addition, there are recommendations to reduce wildfire risk through suppression and evacuation preparedness.

In my professional opinion, if the wildfire risk reduction recommendations contained in this report are followed through all stages of the subject proposal, the risk of wildfire can be reduced to ensure the safety of the intended project.

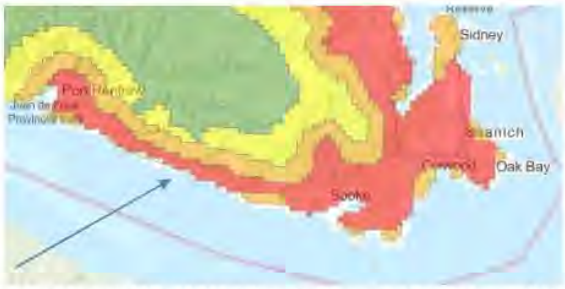
Fire prevention and protection in the interface zone are ongoing processes. Long-term implementation of FireSmart mitigation is essential to increase resiliency of life, property, and ecological processes in the southwest coast's wildland interface.

Introduction

In accordance with the Capital Regional District's Development Permit guidelines for wildfire, Sandcut Properties and Developments Ltd. retained Strathcona Forestry Consulting to conduct a wildfire hazard assessment of two adjoining properties proposed for development of a small resort at 11237 West Coast Road (Highway 14).

The interface (wildland urban interface) describes any area where combustible wildland fuels are found adjacent to homes or other buildings and/or infrastructure. Under Section 919.1(1) (a) of the Local Government Act, development permits may be designated where protection of Natural Hazard Lands is justified to warrant special protection or development control. Natural hazards, including wildfires, may put life and property, and local biodiversity, at risk if development is inappropriately situated and not well planned. Areas assigned at high or extreme risk from wildfires are designated in a Development Permit Area (DPA). The objective of the DPA is to properly manage the risks associated with the hazard (interface wildfires).

The Highway 14 corridor is designated a high risk wildfire interface zone by the British Columbia Wildfire Service. Industrial and commercial operators in high risk areas must comply with obligations and responsibilities with respect to wildfire prevention.



Subject proposal is located in a high risk interface area (red = high risk). BCWS risk map.

Hazard Assessment

This report describes the vegetation, terrain, and infrastructure on and around the subject property, and provides recommendations to reduce the risk of wildfire. Assessment criteria are based on Rating Interface Wildfire Threats in British Columbia (https://www2.gov.bc.ca/), FireSmart (FireSmart, Protecting Your Community From Wildfire (Second Edition. Partners in Protection Partners in Protection, 2003 (https://www.firesmartcanada.ca/), and the Home Owners FireSmart Manual (BC Edition (https://www2.gov.bc.ca/assets/gov/public-safety-and.../homeowner-firesmart.pdf). Fire behavior modeling is standardized after the Canadian Forest Fire Danger Rating System (CFFDRS). Fuel Types listed in this assessment are customized from the CFFDRS Fuel Type list for applicability in south coastal BC. Wildfire threat assessment was conducted through an analysis of fuel threats in and adjacent to the proposed development, as described in the 2017 Wildfire Threat Assessment Guide and Worksheets (MFLNRO, 2017). This process, as used by qualified environmental professionals, employs physical and biophysical factors, combined with fuel hazards, to determine the wildfire threat (low, moderate, high, or extreme). Fire risk is based on four classes: low, moderate, high, and extreme. Recommendations in this report conform to BC Building Code standards and fire hazard planning authorized by Section 3(2) of the BC Fire Services Act.

Field Inspection: Strathcona Forestry Consulting conducted fieldwork in May 2021. Field investigation entailed an analysis of the interface fire hazard that the lands are exposed to, from the perspective of the general area, local sites, and proposed and existing structures in the general vicinity, up to 100+ m from property boundaries, where feasible.

Location and Description of Proposal: The subject proposal encompasses two properties totaling approximately 193 acres at 11237 West Coast Road (Highway 14) at Sandcut Creek/Beach roughly midway between Shirley and Jordan River, on the southwest coast of Vancouver Island. The lower property fronts the waterfront. The upper property extends upslope from the West Coast Road. The phased wilderness resort will initially feature camping, then cabins, followed by a small hall to be used for weddings and reunions. A "welcome centre" is planned where there would also be some serviced and non- serviced campsites.

The lower property straddling the outflow of Sandcut Creek has an existing water license, which the owner is hoping to use for development. The upslope property currently does not have water access.

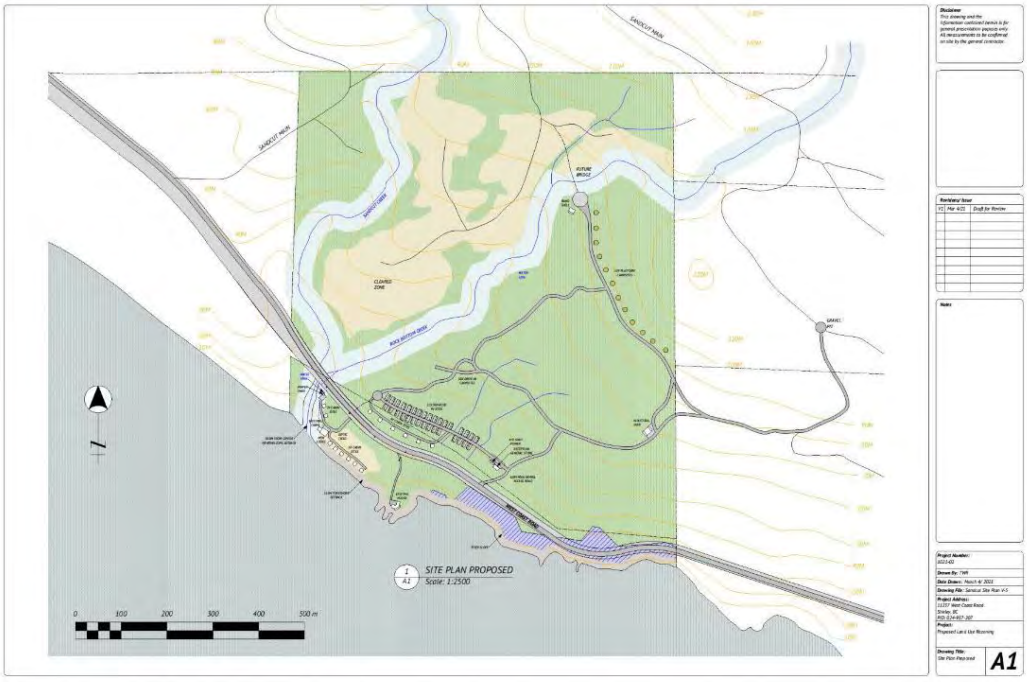
The owner has asked to designer to employ fire-resistive materials such as hardiplank and corrugated steel as much as possible, in addition to steel roofs on all buildings and cabins.

A collection of small accessory structures, including some derelict buildings, found on the lower property, will be removed in conjunction with phased development. A couple of "off-the-grid" temporary structures occupied by the property caretakers are located on the upper property.

Top photos: Views of proposal from West Coast Road. Left: view to NE; right: view to W. Bottom: Sandcut Creek flows into the Strait of Juan de Fuca along western portion of property.

Next page: Proposed Site Plan.

Strathcona Forestry Consulting



The subject proposal is situated on the West Coast Road between Shirley and Jordan River.

7

Wildfire Hazard and Risk

Wildfire hazard is a process, a phenomenon or a human activity that may cause loss of life, injury, or other health impacts, property damage, social and economic disruption or environmental degradation. Wildfire hazard can be described qualitatively as a fire environment—fuel, weather, topography, and ignitions.

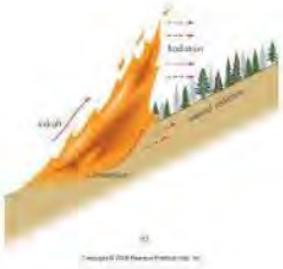
Risk assessment for wildfire and its impacts to communities considers both the likelihood of a wildfire and the potential consequence associated with that likelihood. For example, if the fuel (i.e. the hazard) ignites and the fire spreads towards the community (probability), the wildfire can become a threat to life and property (consequence) with an associated risk of loss.

Determination of the wildfire hazard and risk involves a detailed assessment of potential fire behaviour, field reviewed fuel characteristics, proximity of fuel to the community, local fire spread patterns, topographical considerations and local factors.

Fire Behaviour. Fire behaviour has three components: weather, topography, and fuel. Fire behavior predicts how forest and wildland vegetation (fuel) will burn under different conditions. Weather and topography cannot be changed; alteration of fuels across the landscape is the only way to lower fire intensity and change fire behaviour (See Recommendations).

Biogeoclimatic Classification. The Biogeoclimatic Ecosystem Classification is a system used to classify BC ecosystems based on plant communities and their associated topography, soil, and climate (Green & Klinka, 1994). The subject proposal is located in the Coastal Western Hemlock (CWH) zone transitional between the very dry maritime subzone (CWHxm) and submontane very wet maritime variant (CWHvm1). The CWH Zone occurs at low to middle elevations mostly west of the coastal mountains along the entire British Columbia coast. Southern portions of the zone (i.e., southwest coast of Vancouver Island) in the CWHxm subzone are warmer and drier. Here, Fire Danger Ratings (i.e., the risk of a fire starting) can reach High or Extreme during consecutive days in summer. Forest fires (usually human-caused) between April and October are not uncommon in the general area. Prevailing winds in summer are generally onshore westerlies. Sea fog is common on the west coast of Vancouver Island; it mediates temperature and moisture content.

Topography. Physical site characteristics impact fire behavior by affecting ignition potential and the rate of fire spread. The subject proposal occupies a lower/midslope with gently to moderately sloping terrain. Fires typically spread faster uphill. Hilly terrain tends to increase potential for wildfire behaviour. Warm south- and west-facing aspects are conducive to hotter fires; the subject proposal occupies a southwest aspect. During warmer, drier months in the fire season, there would be an increased fire threat.



Lower portion of proposal occupies a gentle toe slope with an open, mature coniferous forest.

Upper portion of proposal occupies moderate slope with dense coniferous and deciduous forest cover.

Vegetation. Vegetative cover at the site reflects previous human disturbance activities (historical logging, road building for the West Coast Highway, and land clearing).

The subject proposal encompasses a mix of site associations. The lower portion of the area surrounding the outflow of Sandcut Creek occupies a water-receiving, nutrient-medium to rich site where forest cover is dominated by mature second-growth Sitka spruce, western redcedar and western hemlock (with scattered Douglas-fir). *Gaultheria shallon* (salal), *Vaccinium parvifolium* (red huckleberry), and *Rubus spectabilis* (salmonberry) comprise the moderately well-developed shrub layer. There is a moderately well-developed moss layer.

Upslope of the West Coast Road, water shedding sites on fairly well drained soils support dense stands of immature second- and third- growth Douglas-fir and western hemlock (Western hemlock – Douglas-fir – salal association). There is a minimal understory layer in the young coniferous forest; the shrub layer is very well developed in gaps and deciduous pockets, with *Gaultheria shallon* and *Vaccinium parvifolium* dominant, and *Mahonia nervosa* (Oregon-grape) and scattered ferns.

Soils disturbed within the last decade (by roadbuilding, clearing, etc.) support thick growths of deciduous brush and tree species (cherry and red alder).

Fuel Types. Fire behavior predicts how forest and wildland fuels (vegetation) will burn under different conditions. Fuel hazard means the potential fire behaviour, without regard to the state of weather or topography, based on the physical fuel characteristics, including fuel arrangement, fuel load, condition of herbaceous vegetation and the presence of ladder fuels.

The Canadian Forest Fire Danger Rating System – Fire Behaviour Prediction (FBP) classifies fuels into five major groups and 16 benchmark fuel types to forecast how a wildfire will react ((cwfis.cfs.nrcan.gc.ca ›) (Appendix 2). Fuel Types are classified according to stand structure, species composition, surface and ladder fuels and the organic (duff) layer. Each fuel type represents a different fire behaviour pattern. Ongoing work is being done to apply fuel type categories to the diverse forests of British Columbia based on observed fire behaviour (Perrakis & Eade, 2015). Fuel types at the subject site and perimeter area were determined using field reconnaissance:

Major Fuel Types at subject proposal at 11237 W Coast Rd:

Fuel Types	Description/ Location	Forest Floor & Surface Fuels	Ladder Fuels	Wildfire Behaviour (why and how a fire spreads)
C-2 Brush	Patchy to continuous brush In canopy gaps and at disturbed areas: roadsides	Scattered trees. Surface fuel loading variable: generally low, consists mostly of native shrubs, forbs; low woody accumulations (some new, mostly older decaying woody debris)	Lower area: Discontinuous vertical continuity; light fuel loading; Upper area: dense ladder fuels at immature coniferous forest. Brushy pockets have high ladder fuels	Ignition start during warm dry windy weather will increase Rate of Spread– Moderately heavy Fuel loading would contribute to Head Fire Intensity that could > 2000 kW/m – Sloping terrain upslope and brisk winds could facilitate spread of fire
C-5 (modified) coniferous stands	Mature coniferous 2nd-growth trees (along lower reaches Sandcut Creek); denser immature coniferous forests upslope	Lower area: Patchy downed woody fuels and woody shrubs; Upper area: Continuous needle litter; accumulations of dead and downed woody material. debris piles common	Moderately heavy Fuel Loading. Moderately heavy deadfall; ladder fuels moderate	Similar to above, fire start during warm, dry windy weather could increase potential for Crown Fire Initiation.
M-2 (modified) Mixed stands	Mixed (coniferous and deciduous) brushy pockets dominated by deciduous (red alder, wild cherry)	Low to moderate dead and downed woody fuels; continuous brushy understorey with relatively high MC	Scattered conifer crowns extend to ground; scattered to moderate conifer understorey	Rate of spread weighted according to % of softwood/hardwood/broadleaf components; in summer, under canopy, fire spread reduced. Surface torching and crowning.

Risk of Ignition. Risk of ignition represents the potential for fire starts. Risk of ignition could arise from current owners and land users in the area, land development activities, and vehicle activity along the West Coast Road. Observations of squatter activity (i.e., old cabin previously occupied by transients) increases ignition risk. Risk of ignition is currently rated Moderate-high.

Old shack near Sandcut Creek appears to have been recently occupied by transients.

Fire Spread and Intensity. Head fire intensity is a numerical ranking of difficulty of control for specific fuel types. Flame length is a main visual manifestation. Head fire intensity is a major determinant of certain fire effects and difficulty of control. Numerically, it is equal to the product of the net heat of combustion, quantity of fuel consumed in the flaming front, and the linear rate of spread. Under warm, dry conditions, there is currently sufficient continuity of surface and ladder fuels at the subject property to enable a fire to spread relatively quickly. Dry, windy conditions would increase the rate of spread. A goal of Wildfire Risk Reduction (WRR) is to reduce HeadFire Intensity from current estimates of 4 or 5 – at the upper portion of the area - (under High to Extreme Fire Danger Ratings) to less than 2000 kW/m (< 3, HFI column Moderate).

Fire Weather Indices

Hazard Rating	FFMC Fine Fuel Moisture Code	DMC Duff Moisture Code	DC Drought Code	ISI Initial Spread Index	BUI Build Up Index	FWI Fire Weather Index	HFI Head Fire Intensity
Low	0-76	0-21	0-79	0-1.5	0-24	0-4.5	1-2
Moderate	77-84	22-27	80-189	2-4	25-40	4.5-10.5	3
High	85-88	28-40	190-299	5-8	41-60	10.5-18.5	4
Very High	89-91	41-60	300-424	9-15	61-89	18.5-29.5	5
Extreme	92+	61+	425+	16+	90+	29.5+	6

Spotting Potential. Spotting is a fire behavior characteristic in which sparks or embers are carried up by the wind and/or convective column and fall into other downwind fuels to ignite additional fires beyond the zone of direct ignition by the main fire (Firewise.org). During the process of combustion in a wildland fire, vegetative fuels are reduced to flammable vapors, soot, and ash. During the decomposition of the fuel, and before complete consumption, particles of varying size (firebrands) break away from the main fuel source and are lofted upwards by the fire's convection column.

The danger of spotting in wildland fires is that when conditions exist to loft firebrands into the air, the probability exists for multiple subsequent ignitions over a wide area depending on the intensity of the convection and the wind speed and direction. Multiple ignitions can overwhelm any firefighting force.

Fire spotting is one of the major ways that fires spread and homes are ignited and destroyed in wildland/urban interface fires. Firebrands can come down on and ignite combustible roofs, combustible items stored adjacent to homes, and other nearby combustible fuels. The resulting spot fires may go unnoticed and thus unsuppressed when an area has been evacuated of residents, when firefighters are spread too thin, or when spot fires are too numerous.

Fire spotting is related to fire danger ratings. The maximum spotting distance in a particular fire varies according to several factors, including overall fire intensity, wind speed, fuel type, initial size of the ember when lofted up, and how rapidly it is burning (Firewise.org). Many embers burn up completely before landing, but larger embers of slow-burning fuels can keep burning for up to six minutes and travel for several kilometres.

If a fire start occurred during warm dry, windy weather (High/Extreme Fire Danger Ratings), the probability of spotting at the subject proposal is currently very High.

Fire Protection. The CRD provides fire protection services in the Electoral Areas in accordance with service establishment bylaws. The subject proposal is located within the Fire Protection Service Area of the Shirley Volunteer Fire Department. This local community based volunteer department is funded by property taxes from within the fire protection area it serves collected under a CRD establishment bylaw.

The subject proposal is estimated outside a 10 minute response from the volunteer department. This area is also not serviced by hydrants, so a tender shuttle would be required for any suppression activity.

The British Columbia Building Code addresses situations where the firefighter response time 'exceeds 10 minutes in 10% or more of all calls' by requiring higher levels of non-combustible construction and reductions on allowable areas of unprotected openings. The Building Code should address Fire Department concerns.

Fire department response time is the elapsed time, in minutes, from when the first firefighting unit is dispatched to when the first fire fighting unit arrives at the emergency scene. Fire department intervention time is crucial in determining the consequences of a fire in terms of deaths, injuries, and loss of property and damage to the environment.

An early aggressive and offensive primary interior attack on a working fire is usually the most effective strategy to reduce the loss of lives and property damage.

In addition to the potential for delayed response, suppression challenges associated with this proposal include lack of developed fireflow (water storage), lack of developed access, and significant fuel loading (vegetation cover).

Mutual Aid Fire Departments within the CRD operate under a mutual aid agreement with other fire departments within (and outside) the region. In the case of a serious fire, mutual aid from adjoining fire departments can benefit fire suppression by pooling manpower and resources (water supply, water tenders, etc.,). Mutual aid, however, may not always available.

Wildfires The CRD automatically responds to structure fires and small, easily accessible bush fires inside the fire service protection area (FPA). The Wildfire Management Branch generally responds to forested areas outside a FPA.

Water Supply An adequate and reliable water supply for firefighting is an essential part of a community's fire protection system. The Fire Underwriters Survey (FUS) Guidelines outline water specifications for fire protection. The BC Building Code governs the minimum water requirements for buildings.

In fire protection areas served by a community water system, water supply for fire protection generally consists of a piped system in common with domestic potable water. The subject proposal will not be serviced by community water and hydrants.

One of the two properties has a water license which the owner is hoping to use for development. At the upper portion of the proposal, where water will not be as easily accessible in case of fire, the developer has plans to locate 1000L IBC totes of water every 300' throughout the tent camping area for emergency use.

Fire flow would be dependent on the access and staging for tenders along the location of the fire. Strategically located, emergency water storage (minimum 7500 L) is recommended at the tent camping area, cabin area and welcome centre.

Access FireSmart infrastructure and access increase the resident and firefighter safety, and facilitate quick response by firefighters. Developments should have sufficient access

for emergency vehicles, including 2-way road access in and out of any site, and safe driveway accesses. FireSmart infrastructure and access increase the resident and firefighter safety, and facilitate quick response by firefighters. Local government standards for public roads generally follow the BC Building Code and Geometric Design Guide for Canadian Roads (www.tac-atc).

A forking drive will access the cabins below West Coast Road. The upslope area will be accessed via a looping drive. A small footpath at the northwest corner of the upper develoment will provide pedestrian access to the lower portion of the development.

Wildfire Threat Assessment Results

Site level scoring of field data resulted in a CURRENT Fuel Assessment rating of High (see chart next page), with an overall High Wildfire Threat Rating. Factors contributing to the current scores include: existing fuel loading; lack of currently developed access; no developed fireflow; and HeadFire Intensity > 2000 kW/m. Mitigative measures are essential to ensure the threat level is reduced and maintained at safe levels (see Recommendations pg. xx). Threat ratings must be low or moderate to ensure an area and/or structure(s) are safe.

WILDFIRE THREAT RATING SUMMARY: 11237 West Coast Road			
System:	**Subcomponents**	**CURRENT ratings**	**Projected Ratings post-development***
MFLNRO Wildfire Threat Assessment	Fire Behaviour: Fuel, Weather, Topography	Fuel Assessment Class: **High** (see chart next pg.)	Moderate
	Structural (incl vicinity)	High	Moderate
Overall Rating:		**High**	
HIRV Model	Hazard Impact Risk Vulnerability	High High High High	Moderate Moderate Moderate Moderate
Wildfire Risk	Likelihood Intensity Susceptibility	High	Moderate

*Projected ratings conditional upon compliance with recommendations contained in this report.

Wildfire Risk: Wildfire risk is the product of the likelihood of a fire occurring (likelihood), the associated fire behavior when a fire occurs (intensity), and the effects of the fire (susceptibility) on highly valued resources and assets (HVRA) (Scott, J., Thompson M. & Calkin D, USDA, USFS. 2013). Wildfire risk is currently rated HIGH (Refer to Appendix 3). Wildfire risk mitigation is achieved when any of the three aspects are reduced.

Wildfire risk triangle. (Scott et al. 2013).

Generalized Descriptions of the "Fuel Assessment Rating" classes:

Low	Fires may start and spread slowly. There will be minimal involvement of deeper fuel layers or larger fuels.
Moderate	Forest fuels are drier and there is an increased risk of surface fires starting. There will be involvement of the organic layer but larger dead material will not readily combust.
High	Forest fuels are very dry, new fires may start easily, burn vigorously; aerial fuel will be engaged in the flaming front. Most fuel in the organic layer will be consumed and larger dead fuel will be consumed in the smoldering combustion.
Extreme	Extremely dry forest fuel, new fires will start easily, burn vigorously; all aerial fuel will be engaged in the flaming front. Most fuel in the organic layer will be consumed and larger dead fuel will be consumed in the smoldering combustion.

FMC (Fuel Moisture Content) 95% value based on 90th percentile drought conditions.

Fuel reduction targets should be sufficient to be effective to meet treatment objectives of reduced fire behaviour under 90th Percentile Fire Weather Index (FWI) Conditions (FFMC, ISI, BUI) from the BCWS weather network.

At project completion, the desired rating should be Moderate or less.

Recommendations

Wildfires are a natural process on southern Vancouver Islands' forest ecosystems. Development in a fire-prone ecosystem involves taking the necessary steps to protect life and land from wildfire. The BC FireSmart program supports wildfire preparedness, prevention and mitigation to increase resilience to wildfire. FireSmart principles connect to planning at many levels (i.e., infrastructure and planning, construction, vegetation management). FireSmart strategies are essential to the subject proposal to ensure it is resilient to wildfire and safe for the intended purposes.

General Precautions During Land Clearing and Construction

- Ensure any land clearing activities are conducted in compliance with BC's Wildfire Act local bylaws.
- Avoid tree felling during the bird nesting season (mid March to mid July).
- As per the BC Wildfire Act, if a high risk activity (i.e., land clearing) is taking place between 1 April and 31 October, the operator must keep at the activity site fire fighting hand tools, in a combination and type to properly equip each person who works at the site with a minimum of one fire fighting hand tool, and an adequate fire suppression system (onsite portable water tanker and fire fighting tools – shovels, pulaskis, portable water backpacks). In addition, efforts must be made to maintain an adequate fire break between any high risk activity and areas of continuous forest to ensure a fire originating at the site does not escape the site.
- During landclearing, develop an Emergency Plan of Action, listing key contact information in case of fire and/or other emergency at the site.
- Hazard abatement (removal of slash/disposal of debris piles) must take place in compliance with local bylaws.
- Ensure construction workers are made aware of the risk of fire in the interface zone, especially during dry summer weather.

Safety for Workers - Hazardous Tree Assessment/Treatment

- Prior to commencement of construction, a survey should take place to identify hazardous trees. Appropriate treatment must be implemented prior to clearing/construction in order to ensure the site is safe for the uses intended.
- Should any trees be designated as Danger Trees that require falling, a qualified tree service equipped must be employed for tree felling and removal.
- Any hazardous trees identified within the work zone of the BC Hydro powerlines (1.5 tree lengths) will require treatment from a Certified Utility Arborist (CUA).

If hazard trees need to be removed, follow the guidelines of the *Best Management Practices for Hazard Tree and Non-Hazard Tree Limbing, Topping or Removal*. Note that a hazard tree *assessor* is the only qualified professional for assessing danger trees. Consider topping any identified danger tree (at 5 m to 10 m or more) as an alternative to removal, and retaining this as

a **wildlife tree**. Where hazard removal is unavoidable, the work should be as non-intrusive as possible.

Land Use Planning

- As is planned, phase the proposed project to effectively reduce the amount of interface area.

Vegetation Management

FireSmart Zones – (see Appendix 1)

- **Priority Zone 1a: 0-1.5 m**

Zone 1a - The structure itself is sometimes considered as the Home Ignition Zone (1A).
A noncombustible surface should extend for 1.5 m around structures and any attachments, such as decks at the proposed welcome centre, cabins, and campsites. Avoid storing flammable outdoor items, such as wicker or wooden patio furniture, cushions, doormats, window boxes and planters, garbage cans without lids and BBQ propane tanks, which are all places where embers can land and start a fire, in this critical area adjacent to homes/structures.

- Landscape with noncombustible landscaping materials, such as gravel, brick, or concrete.
- Avoid woody shrubs, trees, or tree branches in this zone.
- Create a noncombustible zone underneath and for 1.5 m around any trailers/vehicles.
- Mitigate any auxiliary structures to same standards as those of main structures.

- **FireSmart Priority Zone 1: 0-10 m**

Zone 1 –In this area directly surrounding structure: (all buildings and campsites) out to 10m, people and structures are at risk from radiant heat associated with a wildfire. Analysis of recent large-scale wildfire events (i.e., 2016 Fort McMurray fire) indicate that critical factors protecting structures are exterior construction materials and landscaping immediately surrounding the structures (Westhaver, 2016).
Establish and maintain an environment around all structures (and campsites) that will not support fire. Focus on fuel removal, conversion, and reduction.

- Plan on landscaping with a low density of fire resistant plants and shrubs.
  Avoid the use of cedar hedging.
  Incorporate any existing, native, fire resistant vegetation (i.e., salal, sword fern, red huckleberry, salmonberry).
- Maintain landscapes with regular irrigation, mowing, pruning, raking, weeding and dead plant removal.
- Create non-flammable hardscapes, such as rock, gravel, and water features, which, function as firebreaks by breaking up areas of fuel. Rock can provide a natural looking, low-maintenance and water-efficient mulch and as well as a fire-resistant buffer zone.
- Group fire resistant plant materials in islands. Group plants in islands surrounded by nonflammable materials, such as rock; employ landscape elements together to create breaks between fuels.

- Limb (prune) trees at least 3m from the ground. Create space between trees and shrubs – a general rule is twice the height of what the plant will be at maturity. Remove tree limbs closer than 5m from power lines and any structures.
- Avoid using woody debris, including bark mulch, as it provides potential places for fires to start. Instead, use fire-resistant landscaping materials (i.e., rock).

- **FireSmart Priority Zone 2: 10-30 m** (where applicable)

Zone 2 includes the area from 10 m to 30 m from a structure or facility. There is a still a risk from radiant heat but there is also risk associated with flying embers. In order to prevent a crown fire from establishing in this area, fuels need to be treated aggressively. Conduct FireSmart thinning, lift pruning, and removal of ground fuels in this zone to reduce fuel loading.

- Thin and prune (up to 3 m height from ground) evergreen trees to reduce hazard in this area.
- Within 30 m of structures, selectively remove evergreen trees to create at least 3 m of horizontal space between the single or grouped tree crowns, and remove all branches to a height of at least 2.5 m from the ground on the remaining evergreen trees.
- Regularly clean up accumulations of fallen branches, dry grass, dried arbutus leaves, and conifer needles from the ground to eliminate potential surface fires.
- As discussed at the January 22, 2021 site visit, scattered, low-height Class 3 and 4 cedar snags are permissible to retain (for wildlife) purposes, but it will be important to monitor these trees for any future safety concerns.

- **FireSmart Priority Zone 3: 30-100 m** (where applicable)

Zone 3 - is the area from 30m out to around 100m. People and structures are at risk from ember transport associated with a wildfire in this area. Where fuel modification in Zone 1 and Zone 2 is insufficient to protect structures and/or property, and where property boundaries permit, thinning to reduce stand densities is advised in order to create an environment that will not support high-intensity crown fires.

- Look for opportunities to create a fire break by creating spaces between trees and other potentially flammable vegetation.
- If possible, prune the trees located up to 100 m from the structures.
- Thin and prune overgrown trees to reduce hazard.
- Regularly clean up accumulations of fallen branches, dry grass, and needles from the ground to eliminate potential surface fires.

Site Restoration

- Rehabilitate any disturbed site by planting with a mix of "wildlife friendly," "fire-resistant," native shrubs and forbs: salmonberry, evergreen huckleberry, salal, sword fern, and ferns.

FireSmart Landscaping

- Incorporate FireSmart landscaping by using fire-resistive, widely spaced trees, native shrubs and groundcover in combination with stone and/or water features and/or maintained lawn areas. See FireSmart Guide to Landscaping. *https://www.firesmartcanada.ca/resources-library/firesmart-guide-to-landscaping*

Invasive Weed Plants

- Promptly re-vegetate any areas of soil disturbed during clearing and construction with approved landscaping materials and/or native plant species to prevent encroachment from invasive plant species (i.e., broom).

Construction

For all structures:

- Use fire-retardant roof covering assemblies rated Class A, B, or C (i.e., metal, tile, ULC-rated asphalt) and feature non-combustible siding materials (i.e., stucco, metal siding, brick, cement shingles or cementitious materials, poured concrete, or ULC-rated wood siding) on all new structures. Metal, clay tile, and rated asphalt shingles are the most fire resistant roofing materials. Siding materials such as stucco, metal, brick and concrete offer superior fire resistance to wildfire. Logs and heavy timbers are less effective, while wood and vinyl siding offer very little protection.
- Follow FireSmart guidelines for design, construction, and maintenance of window and door glazing, eaves and vents, and decking https://www.firesmartcanada.ca/
- Ensure structures are equipped with working smoke alarm(s).
- Sheath in the base of decks, balconies and structures with fire-resistant material to reduce the risk of sparks and embers igniting structures.

Water Supply / Fire Protection

- Fireflow is dependent on access and staging for tenders.
- Install onsite fireflow (minimum volume 7500L) at strategic locations every 100 m through the tent camping area. Alternatively, install large volume gravity-fed tank in a central location to service all building and facilities. Ensure fittings are FD-compatible.
- Explore potential for setting up a pump station.
- Maintain hoses, sprinklers, and firetools (shovels, buckets) to be used in an emergency.
- Ensure water storage is mapped on fire department "pre-org" (fire planning) maps.

Access

- Ensure access/egress meets BC Building Code and CRD Engineering requirements.
- As is planned, develop a pedestrian access route between the upper development area and the lower portion of the site. This pedestrian access could also serve as an emergency egress route.
- Ensure strategically located staging areas are established and maintained.
- Ensure access routes are developed with adequate turnouts.
- Ensure address signage (on West Coast Road) is clearly evident during the development phase and at project completion. Letters, numbers, and symbols should be at least 10

cm high, with a 12 mm stroke, contrast with the background colour of the sign, and be reflective.

- As the project proceeds, ensure directional signage is installed to ensure emergency responders can locate specific structures and campsites.
- Ensure any new structures are mapped on fire department "pre-org" (fire planning) maps.

FireSmart Community Resilience

- Conduct regular staff training in emergency response and basic fire suppression and safety training (S100). Ensure training includes regular drills.
- As noted under water supply, ensure there is sufficient onsite water storage strategically located throughout the site for staff to address small wildfires. It should be understood it is beyond the capacity of staff to intercept larger wildfires, which fall under the responsibility of BCWS.
- Establish suppression equipment caches at the camping site, welcome building, and cabins. Equip each cache with: 1 Wajax Pump; • 1 Pump Kit; • 1 Intake Hose; • 1 5-gallon fuel tank with fuel line; • 1200 feet of 1.5" forestry hose; • 2 Pulaskis; • 2 Shovels; • 2 Wajax bags; • Hardhats.
  Ensure equipment is maintained in good working order
- Develop an emergency response plan for fire and other hazards (i.e., earthquake, flooding, major MVI). Ensure all staff is familiar with the plan. Review and update the plan annually. Establish muster areas. Post awareness signs detailing emergency response procedures. Ensure staff and public are familiar with emergency procedures, including reporting a wildfire.
- Enforce a strict "no-smoking" policy.
- Ensure staff is aware of potential ignition sources from specific types of maintenance work (i.e., power saws, welding, etc.) Avoid "hot work" when the Fire Danger Rating is Extreme.
- Explore the benefits of becoming a local FireSmart community: https://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwig1oGy-vrdAhUQHjQIHfuWA1EQFjAAegQIBhAB&url=https%3A%2F%2Fwww.firesmartcanada.ca%2Ffiresmart-communities%2Fcommunity-recognition-program%2F&usg=AOvVaw0ss0JqM2pjcyyHEjczSjU

Regulatory Provisions

- Conduct follow-up assessment to ensure appropriate mitigation measures have been implemented.

Appendix 1. FireSmart Interface Priority Zones

In interface areas, FireSmart advocates the establishment and maintenance of Fuel Management Zones* extending outward from structures and along access routes:

Zone 1a (0-1.5 m): This is the noncombustible zone, where it is very important not to have any combustibles next to buildings.

Zone 1 (0-10 m): The main objective of vegetation management is to create an environment that will not support fire. Vegetation management focuses on fuel removal, conversion, and reduction.

Zone 2 (10-30 m): Where treatment in PZ 1 is not sufficient to significantly reduce the fire hazard due to fuel loading, extend the fuel modified area with a variety of thinning and pruning actions.

Zone 3 (30-100 m): Where fuel modification in PZ1 and PZ2 is insufficient to protect structures and/or property, FireSmart advocates treatment in Priority Zone 3 with a variety of thinning and pruning actions in order to create an environment that will not support high-intensity crown fires.

*Setback Zone distances may be extended depending on aspect, slope, fuel loading, etc.

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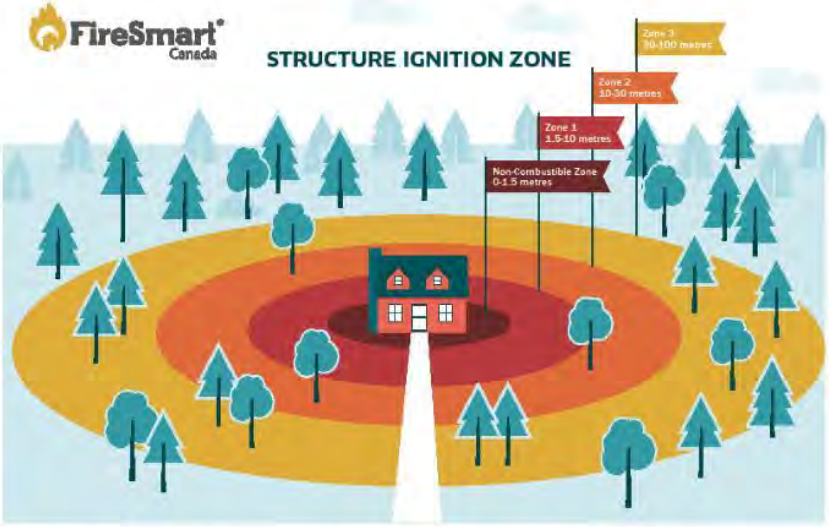
FireSmart Canada

STRUCTURE IGNITION ZONE



Work with your neighbours in any overlapping priority zones!

Non-combustible Zone (0-1.5 metres)	Reduce the chance of wind-blown embers igniting materials near your home. A non-combustible surface should extend around the entire home and any attachments, such as decks. Creating a non-combustible surface can be as easy clearing vegetation and combustible material down to mineral soil. To add to your landscape design, use non-combustible materials such as gravel, brick, or concrete in this critical area adjacent to your home. Woody shrubs, trees or tree branches should be avoided in this zone, any that are present should be properly mitigated.
Zone 1 (1.5-10 metres)	Create a landscape that will not easily transmit fire to the home. A FireSmart yard includes making smart choices for your plants, shrubs, grass and mulch. Selecting fire-resistant plants and materials can increase the likelihood of your home surviving a wildfire. Plant a low density of fire-resistant plants and shrubs. Avoid having any woody debris, including mulch, as it provides potential places for fires to start. Storing items such as firewood piles, construction materials, patio furniture, tools and decorative pieces against or near a house is a major fire hazard. Move firewood piles, trailers/ recreational vehicles, storage sheds and other combustible structures out of this zone and into Zone 2. If unable to move, store firewood inside your mitigated garage, shed or other ember resistant structures, create a non-combustible zone underneath and for 1.5 metres around trailers/ vehicles and mitigate sheds and other structures to the same standards as those of your home.
Zone 2 (10-30 metres)	If your property extends out to this zone, thin and prune evergreen trees to reduce hazard in this area. Within 30 metres of your home, selectively remove evergreen trees to create at least 3 metres of horizontal space between the single or grouped tree crowns and remove all branches to a height of 2 metres from the ground on the remaining evergreen trees. If possible, pruning trees up to 100 metres from your home (Zone 3) is recommended. Regularly clean up accumulations of fallen branches, dry grass and needles from on the ground to eliminate potential surface fuels. Consider seeking the guidance of a forest professional with wildland fire knowledge on appropriate management options for this zone.
Zone 3 (30-100 metres)	Taking FireSmart actions in Zone 3 on your property will influence how a wildfire approaches your home. You can change the dynamics of wildfire behaviour by managing vegetation within this zone. Look for opportunities to create a fire break by creating space between trees and other potentially flammable vegetation. Thinning and pruning is effective here as well. These actions will help reduce the intensity of a wildfire. Consider seeking the guidance of a forest professional with wildland fire knowledge on appropriate management options for this zone.

BRITISH COLUMBIA FireSmart **Begins at Home**

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Appendix 2. Generic Fuel Types (adopted from CFFDRS).

Fuel Type	Description	Wildfire Behaviour Under High Wildfire Danger
Coniferous:		
C1	Terrestrial herbaceous ecosystem: mossy rock outcroppings	High potential for surface fire, especially if high moss/lichen
C2	Dense regeneration to pole-sapling (immature) forest with crowns almost to ground	High potential for crown fires; low to very high fire intensity and rate of spread
C3	Fully stocked, mature forest, crowns separated from ground; sparse understorey	Surface and crown fire, low to very high fire intensity and rate of spread
C4	Dense, pole-sapling (immature) forest, heavy standing dead and down, dead woody fuel; continuous needle litter; continuous vertical crown fuel continuity	High potential for crown fires, high to very high fire intensity and rate of spread
C5	Moderately well-stocked, mature forest, moderate dense understorey crowns well separated from ground; continuous needle litter	Low to moderately fast-spreading, low to moderate intensity surface fire
C6	Fully stocked conifer plantation; absent understorey; tree crowns separated from ground; continuous needle litter	Surface fire may spread rapidly to become high intensity fire with high rate of spread
C7	Open, mature coniferous stand; uneven-aged; discontinuous understorey; tree crowns mostly separated from ground	Surface, torching, rarely crowning (except on steeper slopes), moderate to high intensity and rate of spread
D (Deciduous)	Moderately well-stocked deciduous stands; moderate medium to tall shrubs and herb layers D-1 Leafless D-2 In leaf	Typically a surface fire; low to moderate rate of spread and fire intensity
M (Mixed Forest)	Moderately well-stocked mixed stand of conifers and deciduous tree species; moderate shrub understorey; conifer crowns extend nearly to ground M-1 Leafless M-2 In Leaf	Surface, torching and crowning; moderate to very high intensity and spread rate (varies with slope and % vegetation cover) Fine fuel % and cedar foliage retention will result in faster ignition and spread
S (Slash)	Slash from logging and land clearing	Rapid spreading, moderate to high intensity surface fire
O1-Long	Continuous standing grass – fuel loading is 0.3 kg/m2; scattered trees O1-a Matted O1-b Tall	The taller, and more cured the grass, the more rapid spread; low to moderate intensity surface fire
O1-Short	Continuous human modified short grass	Typically low rate and spread and low fire intensity.

Appendix 3. Fire Risk Classes.

RELATIVE WILDFIRE RISK
Low
Moderate
High
Extreme

Fire Risk Classes

Low (Green): The combination of the local fuel hazard, weather influences, topography, proximity to the community, fuel position in relation to fire spread patterns, and known local wildfire threat factors make it a lower potential for threatening a community. These stands will support surface fires, single tree or small groups of conifer trees could torch/ candle in extreme fire weather conditions. Fuel type spot potential is very low, low risk to any values at risk.

Moderate (Yellow): The combination of the local fuel hazard, weather influences, topography, proximity to the community, fuel position in relation to fire spread patterns and known local wildfire threat factors make it possible that a wildfire in this area would threaten the community. Areas of matted grass, slash, conifer plantations, mature conifer stands with very high crown base height, and deciduous stands with 26 to 49% conifers. These stands will support surface fires, single tree or small groups of conifer trees could torch/ candle. Rates of spread would average between 2-5 meters/ minute. Forest stands would have potential to impact values in extreme weather conditions. Fuel type spot potential is unlikely to impact values at a long distance (<400m).

High (Orange): The combination of the local fuel hazard, weather influences, topography, proximity to the community, fuel position in relation to fire spread patterns, and known local wildfire threat factors make it likely that a wildfire in this area would threaten the community. This includes stands with continuous surface/ crown fuel that will support regular torching/ candling, intermittent crown and/or continuous crown fires. Rates of spread would average 6 -10 meters/ minute. Fuel type spot potential is likely to impact values at a long distance (400 -1 000m).

Extreme (Red): The combination of the local fuel hazard, weather influences, topography, proximity to the community, fuel position in relation to fire spread patterns, and known local wildfire threat factors make it very likely that a wildfire in this area would threaten the community. Stands with continuous surface/ crown fuel and fuel characteristics that tend to support the development of intermittent or continuous crown fires. Rates of spread would average >10 meters/ minute. Fuel type spot potential is probable to impact values at a long distance (400 -1 000m or greater).These forest stands have the greater potential to produce extreme fire behaviour (long range spotting, fire whirls and other fire behaviour phenomena.

4. Campground Emergency Plan June 28, 2023 - RZ000280

Sandcut wilderness Campground emergency plan.

First edition June 28, 2023

The main objective of this plan is to prevent fatalities or injuries, protect the environment and the community. This plan is to help prepare us in case of an emergency so that all employees onsite know what to do.

This plan analyzes our vulnerabilities and this first draft considers what we see as our top ten most likely emergency situations.

This plan is to include:

- Top ten possible emergencies, required actions, written procedures and resources available.
- Detailed lists of emergency response personnel, their duties and responsibilities.
- Site plans, signage and equipment lists.
- Large scale maps showing evacuation routes and service conduits.

As well as addressing these topics we will also have sections of this plan on

Signage and Sitemap

General site security and communications.

First aid training

.

Development of the plan begins with a vulnerability assessment. The results of the study will show:

- How likely a situation is to occur.
- What means are available to stop or prevent the situation.
- What is necessary for a given situation.
- What training or tools could we make available to help in such a situation

From this analysis, appropriate emergency procedures can be established.

In all situations, communication, training and periodic drills will help make sure the plan is executed well.

Note: In some cases, other authorities may have jurisdiction, such as if a serious injury or fatality occurred. Your organization should establish, implement, and maintain a procedure to coordinate managing incidents with the authority having jurisdiction (e.g., police, OH&S inspectors, etc.). This coordination may include the authority taking control of the incident scene.

Although emergencies by definition are sudden events, their occurrence can be predicted with some degree of certainty.

In order to try and anticipate what types of situations we may encounter in our day to day business we have conducted a vulnerability assessment

We have compiled a list of the top ten potential hazards we may encounter below:

- Wildfire
- Earthquakes and Tsunamis
- Snow or severe wind storms.
- Disruptive or violent guest
- Dangerous interactions with wildlife
- Medical emergency.
- Downed power lines
- MVI on Hwy 14
- Missing person
- Loss of electrical power
- Dangerous tree situations

With each possible situation we must consider the series of events or decisions that will need to be made.

What is the situation and how best do we deal with it ?

Based on these events, the required actions are determined. For example:

- Declare emergency.
- Sound the alert.
- Evacuate danger zone.
- Close main gates to incoming traffic if applicable.
- Call for external aid.
- Initiate rescue operations.
- Attend to casualties.
- Fight fire local small fires before they explode into major events

Also consider what resources are required and their location, such as:

- Medical supplies.
- communication equipment.
- Power generators.
- PPE
- Emergency protective clothing.
- Fire fighting equipment.
- Ambulance.
- Rescue equipment.
- Trained personnel.

Our vast and remote location will attract visitors from around the world and this plan is an integral part of our commitment to keep them safe while onsite. It identifies several possible emergency situations we may encounter and outlines clear written systems to best deal with them.

Once operational our campground will be staffed twenty four hours a day and our staff will conduct regular patrols. Our plan to include staff housing will enable us to build a trained team able to help out in case of emergency on short notice.

Management team will have the authority to implement each aspect of this plan and one member must be on the site at all times when the premises are occupied as critical initial decisions usually must be made immediately.

Testing and Revision

Completing a comprehensive plan for handling emergencies is a major step toward preventing disasters. However, it is difficult to predict all of the problems that may happen unless the plan is tested.

Exercises and drills may be conducted to practice all or critical portions (such as evacuation) of the plan. A thorough and immediate review after each exercise, drill, or after an actual emergency will point out areas that require improvement. Knowledge of individual responsibilities can be evaluated through paper tests or interviews.

The plan should be revised when shortcomings have become known, and should be reviewed at least annually. Changes in plant infrastructure, processes, materials used, and key personnel are occasions for updating the plan.

It should be stressed that provision must be made for the training of both individuals and teams, if they are expected to perform adequately in an emergency. An annual full-scale exercise will help in maintaining a high level of proficiency.

Our organization

Our current fire employees are

John Beaumier

Hollie Pethany

Lorne Martin

Eric Albert

Alex Scuffil

John Beaumier is to act as Emergency Coordinator and Hollie Pethany as our "back-up" co-ordinator.

They are both members of and train with the Shirley Volunteer fire department.

Having staff living on site will help ensure that either John or Hollie are onsite incase of emergency and we are also planning on training other staff to be prepared to assume emergency duties in case of their absence. John or Hollie both have the authority to declare an emergency at which point our emergency plan will be activated.

- Reporting the emergency to the highest ranking trained staff onsite who will assume command of the situation.
- Activating the emergency plan and contacting the relevant authorities if necessary be it fire, police or ambulance.
- Establishing communication. - determine what type of emergency and communicate the situation to staff and guests if necessary.
- Providing medical or first aid. The most well trained staff will take charge of this task.
- Ordering response, including evacuation of beach or campground if deemed necessary.
- Restricting access to the site if deemed necessary.
- Alerting external agencies, as necessary.
- Get staff to assist in evacuation.
- Coordinating activities of various groups.

Features of our revised site plan that were not listed on the initial site plan.

Clearly marked footpaths and egress routes from tsunami danger zones and emergency exits from the upper campsite incase of wildfire or other emergency.

Muster area

In the event of an emergency, the muster area on our site map is located by the main emergency egress route. The safety and well-being of our customers and staff is our top priority, and having a well-defined muster area is crucial for effective emergency management.

The muster area is clearly marked with signage and is easily accessible from all areas of the facility. It provides a safe and secure location where individuals can gather and be accounted for in case of an emergency. Our trained staff members are responsible for guiding customers to the muster area, ensuring everyone is aware of the evacuation procedures and assisting those who may need additional support.

Agency Contacts.

All emergency services can be dispatched by dialing 911.

External organizations that may be available to assist (with varying response times) include:

- Shirley Volunteer fire department
- Juan de Fuca Search and Rescue 1397 Copper Mine Rd, Sooke, BC V9Z 1B2
- BC Ambulance Service (Sooke) 250-642-5241 - 6742 W Coast Rd, Sooke, BC V9Z 0E4
- Sooke RCMP - 250-642-5241 2076 Church Rd, Sooke, BC V9Z 0W7
- BC Hydro **Emergency -** 1 800 224 -9376
- Conservation Officer 1-877-952-7277 (To report a conflict with wildlife that threatens public safety)
- BC Archeology Branch 250-953-3334 2975 Jutland Rd, Victoria, BC V8W 2K7

Once we have called for assistance to either Fire, Ambulance or SAR, once onsite we let that outside agency assume command of the situation and try to be of assistance.

Once fully operational the site's reception building will have a backup power generator making it an ideal emergency control center in case of an extreme event.

Many factors determine what procedures are needed in an emergency, such as:

- Nature of emergency.
- Degree of emergency.
- Size of organization.
- Capabilities of the organization in an emergency situation.
- Immediacy of outside aid.
- Physical layout of the premises.

Common elements to be considered in all emergencies include pre-emergency preparation and provisions for alerting and evacuating staff, handling casualties, and for containing the hazards.

The evacuation order is of greatest importance in alerting staff and staff would be allerted over radio communications. .

Earthquake and Tsunami

Post signage detailing emergency response procedures at all entrances to the beaches and throughout the property.

Establish muster areas on the property. Install audible alarms to alert guests on the beach to get to higher ground.

Clearly marked egress pathways for people to higher ground incase of tsunami.

Wild Fire plan

The main aspects of our fire plan involve spacing and limbing trees as well as removing any excess fuel from the forest. This will consist of a massive initial effort before we open for business followed by regularly clean up accumulations of fallen branches, dry grass, and needles from the ground to eliminate potential surface fires.

Much of the following is directly from the risk reduction recommendations contained in the wildfire hazard assessment report by Strathcona Forestry Consulting we had commissioned.

General Precautions During Land Clearing and Construction

Avoid tree felling during the bird nesting season (mid March to mid July).
Ensure any land clearing activities are conducted in compliance with BC's Wildfire Act local bylaws.

As per the BC Wildfire Act, if a high risk activity (i.e., land clearing) is taking place between 1 April and 31 October, the operator must keep at the activity site fire fighting hand tools, in a combination and type to properly equip each person who works at the site with a minimum of one fire fighting hand tool, and an adequate fire suppression system (onsite portable water tanker and fire fighting tools – shovels, pulaskis, portable water backpacks). In addition, efforts must be made to maintain an adequate fire break between any high risk activity and areas of continuous forest to ensure a fire originating dat the site does not escape the site.

Hazard abatement (removal of slash/disposal of debris piles) must take place in compliance with local bylaws.

Hazardous Tree Assessment/Treatment

Prior to commencement of business, a survey will take place to identify hazardous trees.

Appropriate treatment will be implemented prior to opening in order to ensure the site is safe for the uses intended.

Should any trees be designated as Danger Trees that require falling, a qualified tree

service equipped must be employed for tree felling and removal.

Any hazardous trees identified within the work zone of the BC Hydro power lines (1.5 tree lengths) will require treatment from a Certified Utility Arborist (CUA).

If hazard trees need to be removed, follow the guidelines of the Best Management Practices for Hazard Tree and Non-Hazard Tree Limbing, Topping or Removal. Note that a hazard tree assessor is the only qualified professional for assessing danger trees. Consider topping any identified danger tree (at 5 m to 10 m or more) as an alternative to removal, and retaining this as a wildlife tree. Where hazard removal is unavoidable, the work should be as non-intrusive as possible.

A preliminary assessment was done at in the spring of 2023, several hazardous trees were identified and sanitized by Roddy Leask of top it all tree service.

Vegetation Management

A noncombustible surface should extend for 1.5 m around structures and any attachments, such as decks at the proposed welcome centre, cabins, and campsites. Avoid storing flammable outdoor items, such as wicker or wooden patio furniture, cushions, doormats, window boxes and planters, garbage cans without lids and BBQ propane tanks, which are all places where embers can land and start a fire, in this critical area adjacent to homes/structures.

When possible landscape with noncombustible landscaping materials, such as gravel, brick, or concrete. Minimize and thin woody shrubs, trees, or tree branches in this zone.

Create a noncombustible zone underneath and for 1.5 m around any trailers/vehicles.

Mitigate any auxiliary structures to same standards as those of main structures.

Establish and maintain an environment around all structures (and campsites) that will not support fire. Focus on fuel removal, conversion, and reduction.

Incorporate any existing, native, fire resistant vegetation (i.e., salal, sword fern, red huckleberry, salmonberry).

Maintain landscapes with regular irrigation, mowing, pruning, raking, weeding and dead plant removal.

Create non-flammable hardscapes, such as rock, gravel, and water features, which, function as firebreaks by breaking up areas of fuel. Rock can provide a natural looking, low-maintenance and water-efficient mulch and as well as a fire-resistant buffer zone.

Group fire resistant plant materials in islands. Group plants in islands surrounded by nonflammable materials, such as rock; employ landscape elements together to create breaks between fuels.

Limb (prune) trees at least 3m from the ground. Create space between trees and shrubs A general rule is twice the height of what the plant will be at maturity. Remove tree

limbs closer than 5m from power lines and any structures.

Avoid using woody debris, including bark mulch, as it provides potential places for fires to start. Instead, use fire-resistant landscaping materials (i.e., rock).

Thin and prune (up to 3 m height from ground) trees to reduce hazard in this area.

Maintain all roads and cut back vegetation to reinforce the fire break the roads we have built create.

Space trees and other potentially flammable vegetation along the road.

Prune all trees located up to 15 m from all campsites and

During construction

For all structures:

Use fire-retardant roof covering assemblies rated Class A, B, or C (i.e., metal, tile, ULC-rated asphalt) and feature non-combustible siding materials (i.e., stucco, metal siding, brick, cement shingles or cementitious materials, poured concrete, or ULC-rated wood siding) on all new structures. Metal, clay tile, and rated asphalt shingles are the most fire resistant roofing materials. Siding materials such as stucco, metal, brick and concrete offer superior fire resistance to wildfire. Logs and heavy timbers are less effective, while wood and vinyl siding offer very little protection.

Follow FireSmart guidelines for design, construction, and maintenance of window and door glazing, eaves and vents, and decking https://www.firesmartcanada.ca/

Ensure structures are equipped with working smoke alarm(s).

Sheath in the base of decks, balconies and structures with fire-resistant material to reduce the risk of sparks and embers igniting structures.

Wildfire Fire fighting

Our fire fighting plan consists of the following actions.
.
Ensure there is sufficient onsite water storage strategically located throughout the site to knock down small wildfires. It should be understood it is beyond the capacity of staff to intercept larger wildfires, which fall under the responsibility of BCWS.

Build a fire suppression skid equipped with a 2000 liter tank, a high pressure pump, 1000 feet of forestry hose and other fire fighting tools such as Pulaskis, shovels and other implements.

Ensure equipment is maintained in good working and regularly inspected.

Ensure staff is aware of potential ignition sources from specific types of maintenance work (i.e., power saws, welding, etc.) Avoid "hot work" when the Fire Danger Rating is Extreme.

Fire prevention and how to mitigate fire risk.

General site and maintenance.

Site Restoration

Rehabilitate any disturbed site by planting with a mix of "wildlife friendly," "fire-resistant," native shrubs and forbs: salmonberry, evergreen huckleberry, salal, sword fern, and ferns.

Incorporate FireSmart landscaping by using fire-resistive, widely spaced trees, native shrubs and groundcover in combination with stone and/or water features and/or maintained lawn areas. See FireSmart Guide to Landscaping.

Invasive Weed Plants

Promptly re-vegetate any areas of soil disturbed during clearing and construction with approved landscaping materials and/or native plant species to prevent encroachment from invasive plant species (i.e., broom).

https://www.firesmartcanada.ca/resources-library/firesmart-guide-to-landscaping

Actions to mitigate the risk of fires spreading from campsites.

Limb all trees within 10 meters of all campsites to 3 meters from the ground and lay an aggregate base for all campsites.

Post signage at each camp site detailing our clean camp, smoking and campfire policies.

Each campsite will have a steel fire ring to contain campfires and a 18L bucket to fetch utility water which will be made available to guests at several refilling stations throughout the property.

Enforce all local fire regulations and a no smoking policy. Guests will only be allowed to smoke if at their campsites and within six feet of their fire ring.

Nightly patrols will help enforce our policies and monitor campfires.

Local fire regulations will be enforced can be found on the coastal fire centers website at the following link

https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/fire-bans-and-restrictions/coastal-fire-centre-bans

Fire fighting equipment, training and resources.

By far the best resource we have to help us prepare for a wildfire emergency is the Shirley Volunteer fire department where several of our staff are members.

Our plan is to Install large volume gravity-fed tank with FD-compatible fittings in a central location to service all buildings and facilities and we will also explore the potential of setting up a hydrant on West Coast road to service SFD tenders.

- We will maintain equipment such as trucks, pumps, hoses, sprinklers, and firetools (shovels, buckets) to be used in an emergency.
- Install directional signage to ensure emergency responders can locate specific structures and campsites.
- Ensure SFD always has the most up to date sitemap showing all the facilities, buildings, campsites, cabins and water storage. Ensure any new structures are mapped on fire department planning maps.
- Ensure access/egress meets BC Building Code and CRD Engineering requirements.
- Develop a pedestrian access route between the upper development area and the lower portion of the site. This pedestrian access could also serve as an emergency egress route.

- Ensure strategically located muster areas are established and maintained.
- Ensure access routes are developed with adequate turnouts.
- Post signage marking directions to muster areas and emergency exit paths and roads.
- Maintain emergency egress roads from C loop onto neighboring lands to connect to the new logging main.

Fuel storage

Areas where flammables, explosives, or chemicals are used or stored should be considered as the most likely place for a technological hazard emergency to occur.

All fuel stored onsite will be done in accordance with the BC Government regulations found at the following link.

https://www2.gov.bc.ca/assets/gov/environment/waste-management/industrial-waste/industrial-waste/oilandgas/fuel_handle_guide.pdf

Our plan to mitigate any dangerous wildlife encounters.

- Create fenced off and bear proof enclosures around all garbage dumpsters, compost and recycling facilities.
- Create and post signage and brochures containing information of bears and cougars at several locations around the property.
- Equip the campsite with several "bear saver" garbage bins to prevent feeding of wildlife.
- Food storage lockers will be provided for campers arriving by shuttle, bike, or foot (those without a vehicle).
- Our on-site service vehicles will be outfitted with radios, sirens, air horns, and bear bangers and spray in case of any close encounters with potentially dangerous wildlife around the campsites.
- While visitors are welcome to bring dogs, they will be required to keep them on a leash at all times for the safety of other guests *and* to avoid provoking any wildlife.

Although encounters with dangerous wildlife are *extremely* rare (only two black bear-related attacks have been recorded in the last 50 years on the island, both non-fatal), we will still vigilantly plan for them to keep our guests and animals safe.

Hollie and John on their first day at the SFD. They have since both been on several fire and rescue calls and other than a few weeks vacation have yet to miss practise.

An image of some of our current fire fighting equipment.

General site security

Our security plan involves the three main elements below.

1. Training and tasks

Hollie and John both plan on completing basic BST training before we open for business. Our employees tasked with patrolling the grounds will be trained

2 - Equipment

Currently we have a CCTV system installed at the house but will install a second in and around the reception center and at the front gate as infrastructure is built out. We are also going to be looking into business management software to track all of our guests and effectively ban any trouble makers.

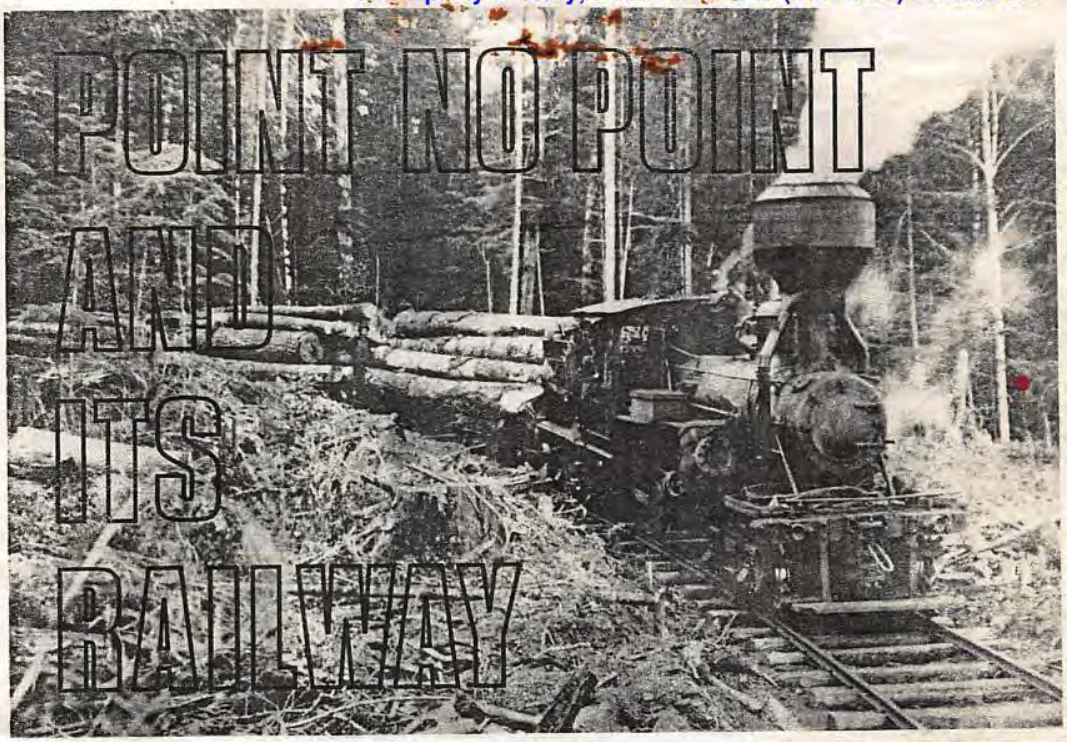
Our equipment our staff will have are patrol vehicles and radios.

3 - Communications

We have purchased high quality two way radios that cover the entire site and plan on applying for a private radio band on which to operate and will train staff in proper radio communications

We plan on writing a manual to help our staff deal with any unruly guests which will include de escalation tactics and have other helpful resources.

POINT NO POINT AND ITS RAILWAY



Climax locomotive working for Cooke and Moore of Sooke before its move to Point No Point. (Sooke Region Museum photo No. 444)

by Patrick O. Hind

To Islanders and visitors alike, one of the most scenic and certainly interesting drives is to take the Westcoast Highway past Sooke to Jordan River and Port Renfrew. Spectacular views of mountain and sea greet those who venture along this route. At the Point No Point resort and tea house many enjoy traditional English afternoon tea, looking out over the Ocean and the distant mountains of the Olympic Peninsula. Few would recall, or know that in earlier years, the late 1920s, the Point was the scene of an active logging operation, its logging railway harvesting the green gold that grew from the Ocean shore into the distant hills. Several steam locomotives worked over a dozen miles of rail hauling logs to tidewater, where they were boomed and towed in rafts to the mills in Victoria, 35 miles away.

During the 1920s the Canadian Puget Sound Lumber and Timber Co. operated a large mill in Rock Bay at Victoria, employing 350 men to produce up to 250,000 feet of lumber per day. It was one of the largest Island concerns at the time. To supply their mill with logs C.P.S., as they were widely known, were operating a logging railway that ran from Jordan River inland to stands of timber while a subsidiary, the Island Logging Company, was operating at Charter Siding, west of Duncan. By 1927, logging was being completed at the latter location and plans were being made to open two new camps. Camp 3 was to be at the head of Cowichan Lake, at Kissinger on the C.N.R., while Camp 2 would open at Point No Point where C.P.S. had extensive timber limits. The *B.C. Lumberman* in early 1928 reported on the activity.

"The Jordan River country is now coming into prominence and within a few months will probably be one of the most active scenes of logging, as a result of the plans for big-scale operation by the Canadian Puget Sound Lumber & Timber Company. The company has at the present time about four miles of railroad in there and this will be extended as logging progresses. An unloading dock has been constructed; also a breakwater at Point No Point, where logs will be dumped. Bunkhouses and camps have been built on sleds so that they can be moved from place to place without reconstruction. New equipment throughout is being put in. In the past twelve months new equipment purchased comprises a 90-ton Shay locomotive, 13x14 Washington unit, 12x14 Washington yarder, two 9x10½ Washington duplex loaders, 30 logging cars, 1 moving car and 2 gas shovels. A fuel oil tank capable of storing 2200 barrels of oil is now being installed. According to John D. Kissinger, resident manager, it is

proposed to put between four and five million feet of logs into the water every month at the outset. This will be steadily increased. About a billion feet of timber is to be logged by the company in the Jordan River district."

Despite the elaborate plans of the Island Logging Company and the fact that the timber available was of the finest grade of Douglas-fir and Spruce on the southern coast, they were soon to experience many difficulties in operation. Not the least was the booming of logs in open water on the turbulent Pacific.

The company planned to dump their logs at a wharf which was to be constructed in a bay on the east side of the Point. This necessitated a breakwater to be built to protect the proposed wharf, and a quarry was located about one quarter of a mile inland where suitable rock could be obtained. The remains can still be seen of this quarry as can the remains of the breakwater and trestle work at very low water. The site of the latter, through the courtesy of Western Forest Products, is a favorite picnic ground for the general public.

The first piece of equipment to be landed at Point No Point was a small steam donkey which was then used to haul the first of the railway equipment off a barge. This was a Climax locomotive that the company brought over from the Jordan River operation. Prior to that the locomotive had been used by Cooke and Moore of Sooke on their line from Demamiel Stream to Sooke Harbour. It was put to work hauling rock from the quarry to build the breakwater, then not being considered heavy enough for the intended logging operation was taken back to Jordan River where it remained for some years afterward.

In order to facilitate the unloading of larger and heavier equipment at the Point, the company built an elaborate underwater ramp on the inside of the breakwater. This was formed by a crib of logs filled with large rocks and enabled a barge to be positioned at high tide and then unloaded after it had settled on the receding tide. Sections of rail were then connected to the rails on the barge and the equipment could be moved on or off the barge with relative safety. The remains of this underwater crib can also be seen at extremely low tide today.

Once this crib was built, the company landed a large 3-truck 107 ton Class 90 Lima Shay locomotive which was immediately placed in service to aid in construction of the railway. It was to become Island Logging Company's No. 3, procured new from the Lima Locomotive Works (builders number 3313). Track was laid from a point west of the breakwater in a northwesterly direction towards Jacobs Creek, which empties into the sea just west of the Point. Track crossed the Westcoast Road, or as it was then, a trail, on a 2% grade then ascended the gently rolling southern slope of Mount Campbell, so named for the pioneer grandfather of Miss Christine Clark of Shirley. West of Jacobs Creek the camp was located, built of moveable bunkhouses, and would house from 100 to 150 men, and some families. The repair shop was located on the northwest side of the camp.

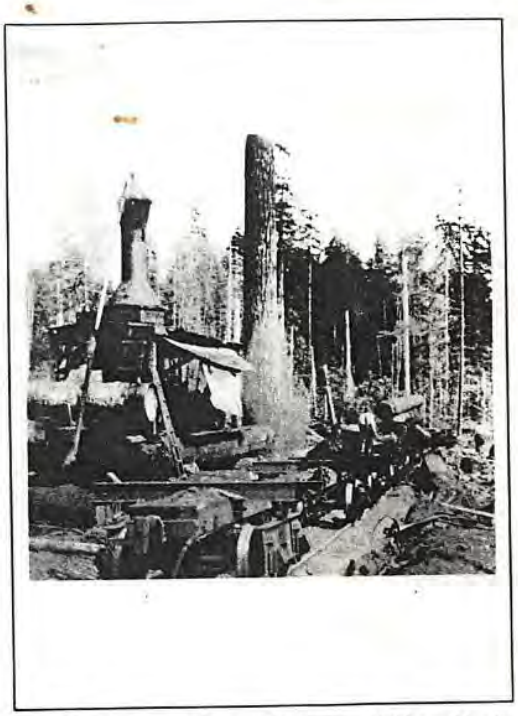
From the camp, the line traversed a series of switchbacks that wound their way up the side of Mount Campbell. Because of the undulating nature of the ground and small streams, many small to medium-sized trestles were required in building the line which eventually was close to 12 miles in length.

Site of former wharf which extended 400 feet from waters edge.

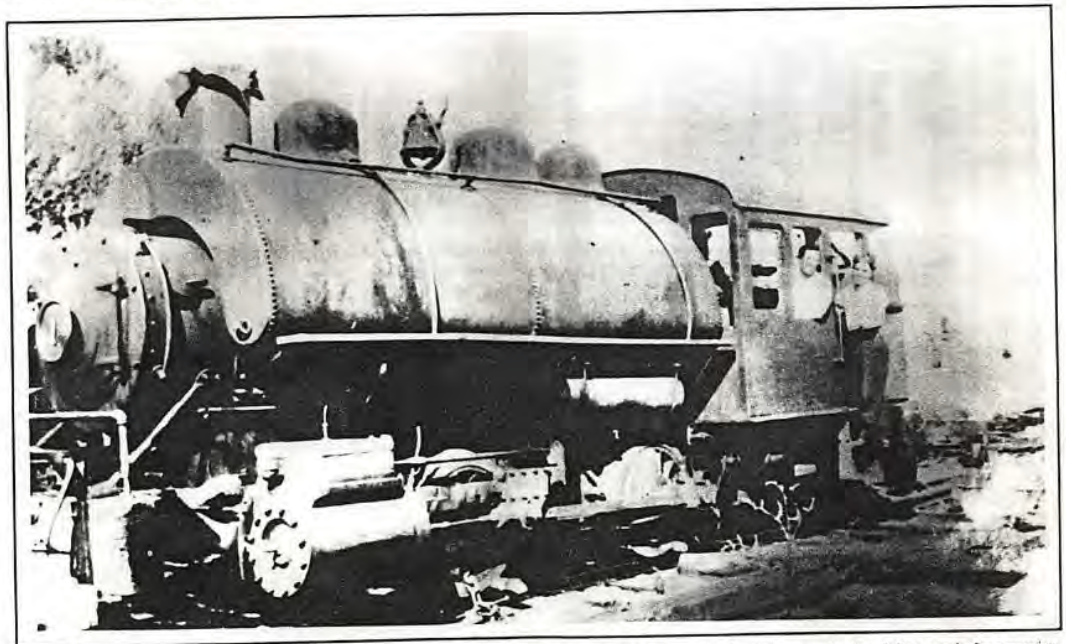
Huge rocks that formed part of the breakwater, seen at very low tide. Bay where logs were boomed is visible at left.

Site of underwater crib where equipment was unloaded, located just to the left of the breakwater. (Author's photos)

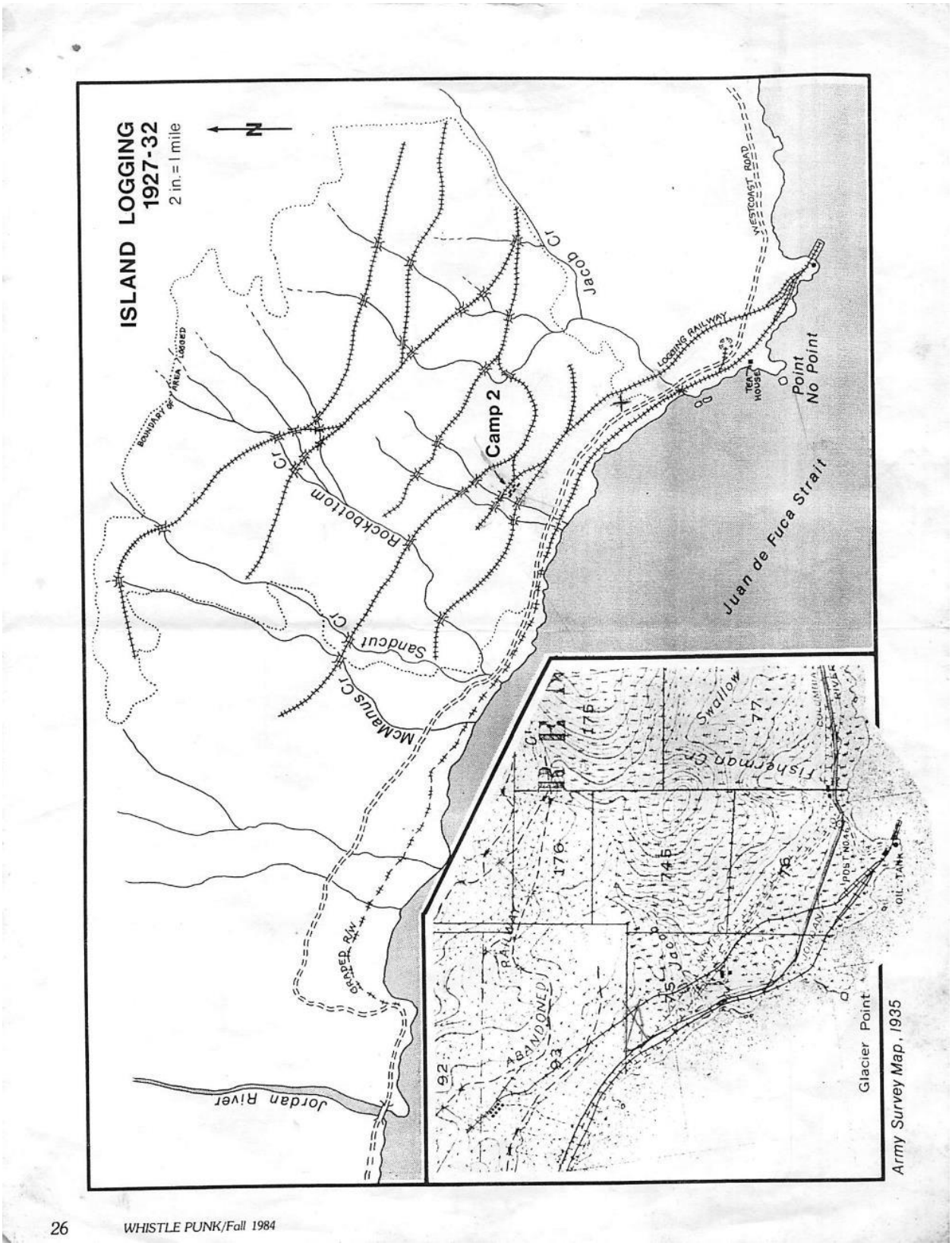
A second Shay locomotive, a 2-truck 50 ton Shay (builders number 3228) that had been used at Charter Siding, and in 1929 a third and final Shay were added. The last was a 3-truck 'Pacific Coast' Shay purchased new from Lima (builders number 3340). A fourth locomotive was also brought from Charter Siding, an 0-4-0 saddle tank locomotive with an interesting and eventful career to that time. It was built by Vulcan in July, 1912 (builders number 1960) and was standard gauge with 15x20 inch cylinders and 37 inch drivers. The locomotive was first sold to Foley, Welch and Stewart who were then constructing the Grand Trunk Pacific Railway west towards Fort George and eventually the west coast at Prince Rupert. It was their No. 51 and appears to have worked as far west as Prince Rupert on this construction. In 1912 the same company took over the construction of the proposed railway from Squamish to Fort George and it is believed the locomotive worked on the northern section until construction there ceased. In 1917 the locomotive, then numbered P.G.E. No. 1, was used by the Capilano Timber Company in building their line into the Capilano Valley. Afterwards it was sold to Falls Logging who were then working at Charter Siding and here it was featured in a minor wreck. On November 9th, 1920 with Engineer Dean at the controls Locomotive No. 1 with "No Air, No Sand and slippery rails, with 2 cars of logs," as the subsequent report stated "went down a grade and ran into a coal car injuring three Japanese workers." Taken over by C.P.S. it found its way to Point No Point where it was probably only used for transportation of men and equipment on the railway and not for the hauling of logs.



Typical logging scene of the period with steam skidder and loader adjacent to tracks and skeleton log cars. This photo taken at Port Renfrew. (Sooke Museum photo)



0-4-0 Vulcan locomotive No. 1 shown at Point No Point with Mr. Kissinger in the cab. This locomotive had a long and colourful history before coming to Point No Point. (photo Sooke Region Museum No. 3262)



26 WHISTLE PUNK/Fall 1984

Two sides were operated at the Point under foreman Charles Kaske and his replacement L. Kingery. The equipment consisted of two high lead units and a Diesel cold deck yarder which was one of two the company had purchased. "They," the *B.C. Lumberman* noted, "are the latest in logging equipment and have an advantage in being safe as far as fire is concerned. These machines, of which the cost is understood to be $27,000 each, without lines, have proved of considerable interest to logging operators, many of whom have travelled to see them in operation. They are the only machines of this kind on the island."

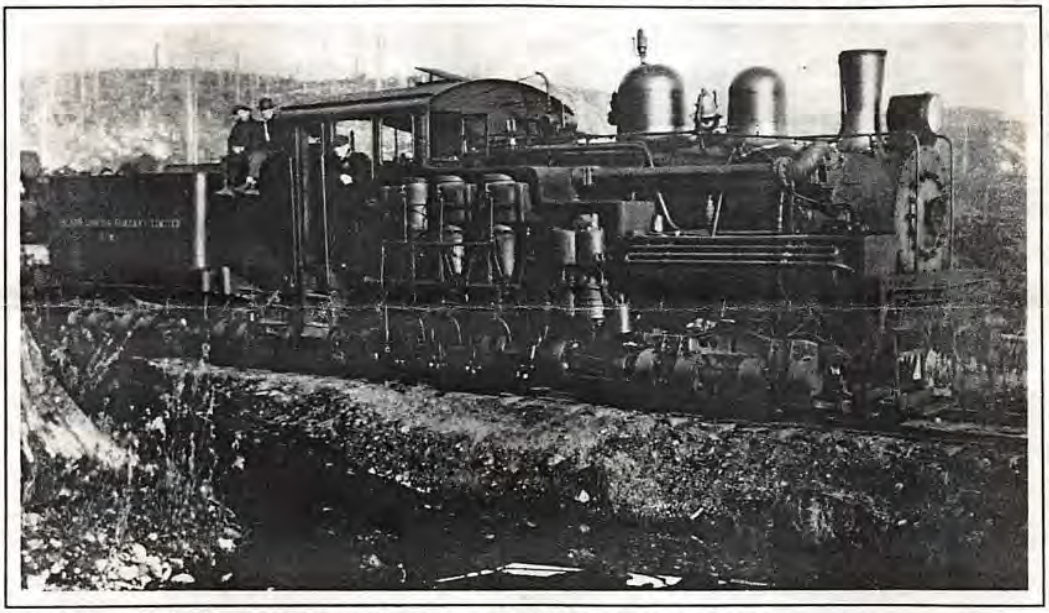
At the wharf a Jill Poke or 'Stiff Leg' was located and as each car moved past this apparatus the logs were dumped into the water. The length of the wharf was long enough to accommodate nine fully loaded skeleton log cars at a time. Once the logs were dumped they were boomed in the bay before being towed to the C.P.S. mill at Victoria. Between Camps 2 and 3 log production, at least in 1929, was 11 million feet per month, of which 6 million was used in the mill and the remainder sold in the open market.

The difficulties encountered by Island Logging were extreme. As mentioned, tidal action was heavy and the dumping of logs and forming of booms was sometimes disrupted. Ivan French, a longtime resident of the area and former logger, tells of many occasions when the log booms would be broken apart by the waves. One time he remembers when the boom shack was sunk by errant logs. In severe storms large waves would break completely over the breakwater and wharf trestlework and one time the oil storage tank located at the Point was left sitting to one side, its foundation completely washed out by the waves. The first winter found many days when logs could not be unloaded, let alone boomed, and production in the woods would have to be curtailed until weather improved.

Another unforeseen factor that was to plague the operation, although from a distant source, was that by late 1930 the export market, Japan and China in particular on which the C.P.S. mill depended, had virtually disappeared. An oversupply of lumber in the yard and limited sales, sometimes at "prices excessively low", forced an indefinite closure of the mill. Sporadic logging continued but it was not until after the depression that the company was able to resume a steady logging operation. By this time truck logging was gaining in popularity, most of the accessed timber had been logged, and the railway at Point No Point was no longer required.

However, before this ultimate demise the company had proceeded with a plan to rectify their dump problems by finding a safer location. Accordingly, in early 1930, a plan was unveiled to build a line of railway west from the Point to Jordan River where there was relative safety. The plan was not new to the company. At one time in the early part of the century, a scheme had been unfolded for a logging railway to run from the mouth of the San Juan River at Port Renfrew south along the coast to a connection with the Canadian Northern Railway, then under construction, at Milnes Landing. From there logs could be shipped over C.N. tracks to the company's mill in Victoria. This elaborate scheme was not to be realized.

The latter attempt by Island Logging saw the entire route from the Point to Jordan River surveyed and graded. It left the existing grade west of Point No Point, at a location about 200 yards east of the present tea house. It



Island Logging's Shay No. 3 on the south slope of Mount Campbell in 1929. (photo D. Muralt collection)

6. Water Supply Assessment, April 2023 - RZ000280

COLQUITZ ENGINEERING LTD.
4115 Elwood Avenue
Victoria, BC V8Z 5J9
(778) 749-1114

TECHNICAL MEMORANDUM

April 10, 2023

Sandcut Properties and Developments Ltd.
11237 West Coast Road
Shirley, BC V9Z 1G9

RE: 11237 WEST COAST ROAD
Water System Supply
Project Number: 307.001

Introduction

The purpose of this technical memorandum is to outline the surface water supply conditions for the proposed development of 11237 West Coast Road. This memorandum is based on the proposed development as outlined on the drawings *11237 West Coast Road, Sandcut Campground & Resort, Rezoning Application, Knotinabox Design Inc., November 1, 2022*. These drawings outline the proposed land-use as follows:

- Dwelling units (existing house) – 1
- Reception / general store / caretaker residence - 1
- Tourist cabins – 38
- Standard campsites (no hook-ups) – 61
- RV campsites (full hook-ups) – 23

Water Supply and Demand

Sandcut Properties and Developments Ltd. hold a current water licence for withdrawal of 13.6 m^3/day from Rockbottom Creek. This water licence is attached to this memorandum for reference.

The estimated water demands (daily design value) for the proposed land-uses are summarized in Table 1 below. These values, with the exception of the *standard campsite*, are calculated in accordance with the *Sewerage System Standard Practice Manual Version 3, September 2014, Health Protection Branch, Ministry of Health*. The *standard campsites* are to be serviced by a central shower facility, tap stands and composting toilets, with estimated demands as described below based on information provided by the Ministry.

Table 1: Water System Demands

Proposed Land-use	# Units	Design Demand (L/unit/day)	Design Demand (m^3/day)[6]
Dwelling units (existing house)	1	1,600[1]	1.6
Reception / general store / caretaker residence	1	490[2]	0.5
Tourist cabins	38	900[3]	34.2
Standard campsites (no hook-ups)	61	300[4]	18.3
RV campsites (full hook-ups)	23	340[5]	7.8

Notes:
1- Based on 3 bedrooms – Table II-8
2- Based on 2 resident workers (170 L/c/day + 75 L/c/day) x 2 (P.F.) – Table III-11
3- Based on 2 person occupancy (225 L/c/day) x 2 (P.F.) – Table III-11
4- Based on 3 person per site occupancy and a peak demand of 130 L/c/day minus 30 L/c/day (for composting toilets)
5- Based on average of demand (170 L/site/day) x 2 (P.F.) – Table III-11
6- Demands exclude irrigation

The total daily design demand for the proposed land-use is estimated to be 62 m^3/day, which exceeds the water licence quantity of 13.6 m^3/day. Working within the existing water licence quantity, we estimate the proposed land-use could include:

- Dwelling unit, Reception / general store / caretaker residence, and 12 tourist cabins, or;
- Dwelling unit, Reception / general store / caretaker residence, and 38 standard campsites, or;
- Dwelling unit, Reception / general store / caretaker residence, 23 RV campsites, and 12 standard campsites, or;.
- Dwelling unit, Reception / general store / caretaker residence, 4 tourist cabins, and 26 standard campsites.

Water Licence Changes

We understand that the following changes to the water licence are proposed to support the development:

- Revise the purpose of the current water licence from "domestic" to "commercial enterprise".
- Move the water intake location upstream by approximately 650 m upstream.
- Increase the water licence withdrawal quantity to approximately 62 m^3/day.

In discussions with the Ministry of Forests (MoF), we understand that a change in purpose and change in the water intake location can be handled as a water licence amendment. In reviewing the contours and watercourse layers on the CRD Regional Map (https://maps.crd.bc.ca) we estimate that the reduction in catchment area by moving the intake upstream is approximately 5%. To apply for a water licence amendment, an application will have to be submitted through FrountCounterBC (https://portal.nrs.gov.bc.ca/web/client/home). The acceptance of the amendment application is decided upon by a Water Manager from the Province of British Columbia. We do not anticipate there will be issues with the proposed amendments.

The water licence only limits the daily withdrawal. If on-site storage is provided, 13.6 m^3/day could be withdrawn even when it is not needed. For example, if only 4 cabins and 15 standard campsites are used during weekdays (total demand of 10.2 m^3/day - includes dwelling unit, reception / general store / caretaker residence), approximately 3.6 m^3/day could be stored daily (total of 18 m^3 over five days) for use on the weekend. This would allow for approximately 8 cabins and 44 standard campsites to be occupied during two-day weekends.

To increase the water licence withdrawal quantity, a new water licence application will be required. A key consideration is the availability of flow for proper functioning of the aquatic ecosystem, as described in the provincial environmental flow needs (EFN) policy (https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/water-rights/efn_policy_jan-2022_signed.pdf). This policy defines the sensitivity of the stream based on a number of factors including the proposed withdrawal as a percentage of the long-term mean annual discharge (MAD) and mean monthly discharge (MMD). A search the Water Survey of Canada (WSC) database did not show any flow data (active of historical) for Rockbottom Creek or Sandcut Creek. Therefore, it is likely that a minimum one-year flow monitoring program will be required to determine the MAD and MMD values for Rockbottom Creek to use in the EFN calculations.

Additionally, the physical works of constructing the new intake would be considered "changes in and about a stream" as defined by the Water Sustainability Act (WSA). Therefore, a WSA Section 11 application will be required. This application is to be made once the intake works, have been designed, and typically take a minimum of 140 days for approval. Applications may be referred to other provincial and federal regulatory agencies for comment.

colquitz engineering

11237 WEST COAST ROAD
Water System Supply
April 10, 2023

Summary

In summary, the proposed campground and resort development will have an estimated peak water demand of 62 m^3/day. This exceeds the current water licence withdrawal rate of 13.6 m^3/day. Working within the existing water licence quantity, we estimate that the site could be partially developed, as described above. We anticipate that a change to the current water licence purpose and intake location can be done as a water licence amendment.

Working within the existing water licence withdrawal rate, on-site water storage could be beneficial to take advantage of partial occupancy during weekdays, allowing for greater occupancy during weekends.

The full development exceeds the current water licence withdrawal rate and therefore a new water licence will be required. We anticipate that one year of flow monitoring data of Rockbottom Creek will be required to support the new water licence application.

The acceptance of the water licence amendment or new water licence will be decided upon by the Provincial Water Manager. We therefore recommend that the MoF be consulted with prior to going ahead with either option (water licence amendment or new application), including providing them with copies of this memorandum and the environmental assessment report.

Additionally, a Water Sustainability Act Section 11 application will be required for the construction of the new intake.

Prepared By

Regards,

COLQUITZ ENGINEERING LTD. (Permit to Practice 1002144)

Jeff Howard, P.Eng.
Water Resources Engineer

JH/jh

Statement of Limitations

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Revision History

Revision #	Date	Status	Revisions	Author
0	Mar 8, 2023	DRAFT	In progress, submitted for client information	J. Howard
1	Mar 20, 2023	DRAFT	Submitted for client review	J. Howard
2	Apr 10, 2023	FINAL	Submitted for client acceptance	J. Howard

Province of British Columbia
Water Sustainability Act

CONDITIONAL WATER LICENCE

The owner of the land to which this licence is appurtenant is hereby authorized to divert and use water as follows:

a) The stream on which the rights are granted is Rockbottom Creek.

b) The point of diversion is located as shown on the attached plan.

c) The date from which this licence shall have precedence is September 11, 1956.

d) The purpose for which this licence is issued is domestic.

e) The maximum quantity of water which may be diverted for domestic purpose is 13.6 cubic metres per day.

f) The period of the year during which the water may be used is the whole year.

g) The land upon which the water is to be used and to which this licence is appurtenant is Lot A, Section 74, Renfrew District, Plan VIP71883.

h) The authorized works are pipe, tank, pump and intake which shall be located approximately as shown on the attached plan.

i) The construction of the said works has been completed and the water is being beneficially used. The licensee shall continue to make regular beneficial use of the water in a manner authorized herein.

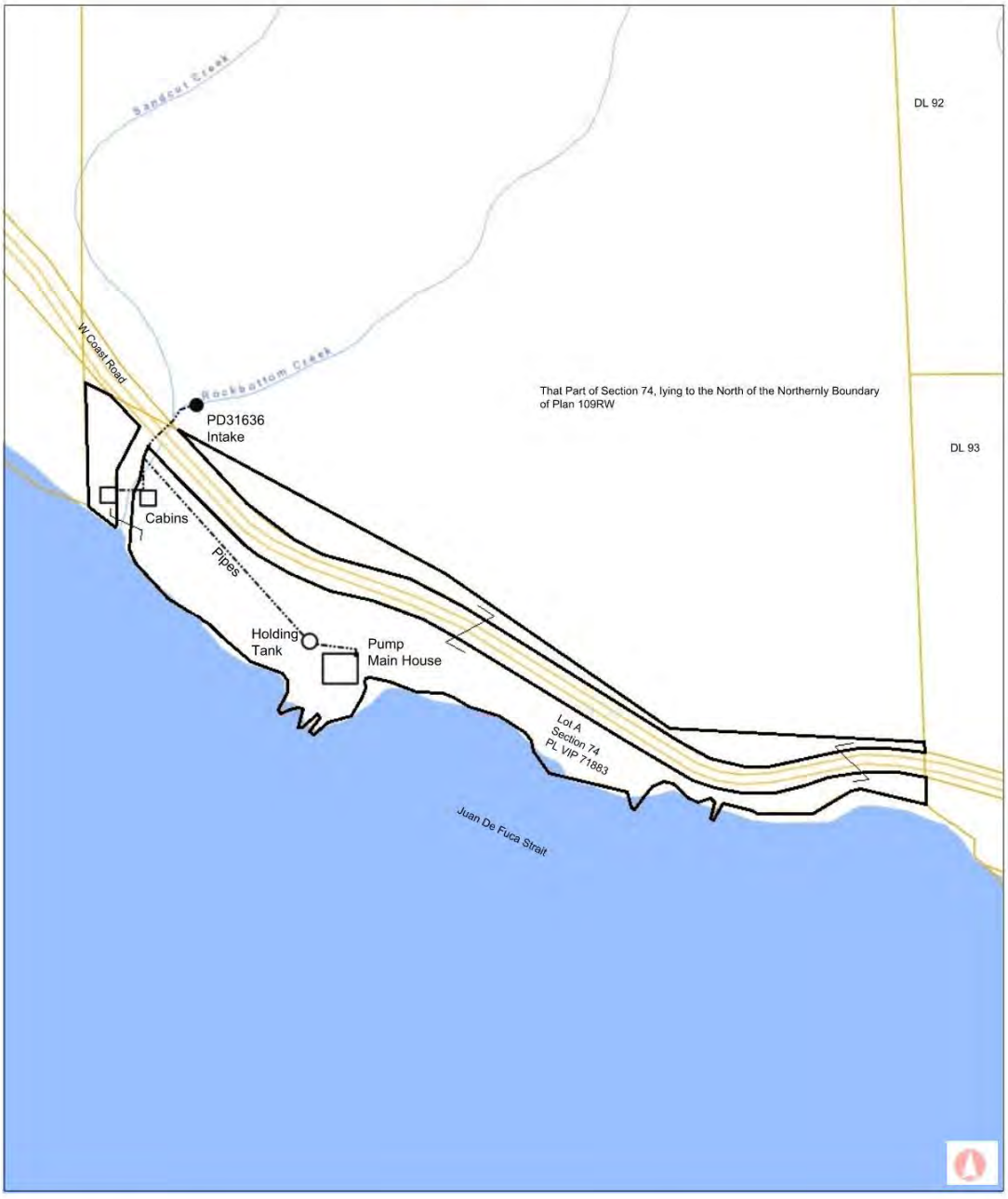
j) This licence authorizes the use of water for domestic purpose in a maximum of 6 dwellings, 3 of which are located approximately as shown on the attached plan.

k) This licence is issued in substitution of Conditional Water Licence C023427.

David Robinson
Assistant Water Manager

File No. 0213380 **Date Issued: January 07, 2021** **Licence No.: 502921** **1**

BRITISH COLUMBIA



WATER DISTRICT: Victoria
PRECINCT: Victoria
LAND DISTRICT: Renfrew

Signature: _____
Date: _____

LEGEND:

Scale: 1: 4,000
Point of Diversion: ●
Map Number: 92C.050.2.2
Pipe: – •• – •• – ••

C.L. 502921
File 0213380

This licence supersedes Conditional Water Licence C023427

The boundaries of the land to which this license is appurtenant are shown thus: ━━━

PPS