



KIMBERLEY • VICTORIA • CALGARY

ENVIRONMENTAL REPORT

for Zoning Amendment Application

of Parcel B Appaloosa Way, Duncan, BC

August 2023

REPORT COMPLETED FOR:

Top Down Investments
Suite 106, 225 Canada Avenue
Duncan, BC V9L 1T6

REPORT COMPLETED BY:

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6 – 100 Sullivan Drive
Kimberley, BC V1A 0A7

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1 INTRODUCTION

Parcel B Appaloosa Way (the property) is an assembly of three parcels in the Sahtlam Area, west of Duncan, BC. The property details are provided below in Table 1.

TABLE 1. PARCEL B APPALOOSA WAY PROPERTY DETAILS

PID	SIZE	DETAILS/NOTES
PID:009-845-119	66.75 acres	Western most parcel. Contains existing historical roads. A large portion of this parcel, surrounding the largest wetland, is designated as a covenant for the Nature Conservancy.
PID: 009-849-581	10.00 acres	Middle parcel. The southern half of this parcel is within the NCC covenant.
PID: 009-849-637	72.98 acres	Eastern most parcel. A portion of the southern part of this parcel is within the NCC covenant.

The property is currently zoned as R-5 within the Cowichan Valley Regional District (CVRD) Electoral Area E - Cowichan Koksilah/Quw'utsun Xwulqw'selu. The property is currently undeveloped. A series of overgrown historical logging roads criss-cross the property. The property is forested and contains a complex stream and wetland network.

The owner is planning to develop the property into residential lots. Details of the development options are discussed in the accompanying Development Report by Asio. This document addresses the requirements in Schedule C of Bylaw No. 4270 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 activities considered as part of the preliminary development of the property are: road-building, building site preparation, lot servicing, and installation of utilities.

A Riparian Areas Protection Regulation (RAPR) assessment has been completed for the wetland and watercourses on the property. Once the development plans are finalized, the RAPR assessment will be finalized and will be submitted to the province for approval in support of the Riparian Development Permit Applications to the CVRD for development of the property.

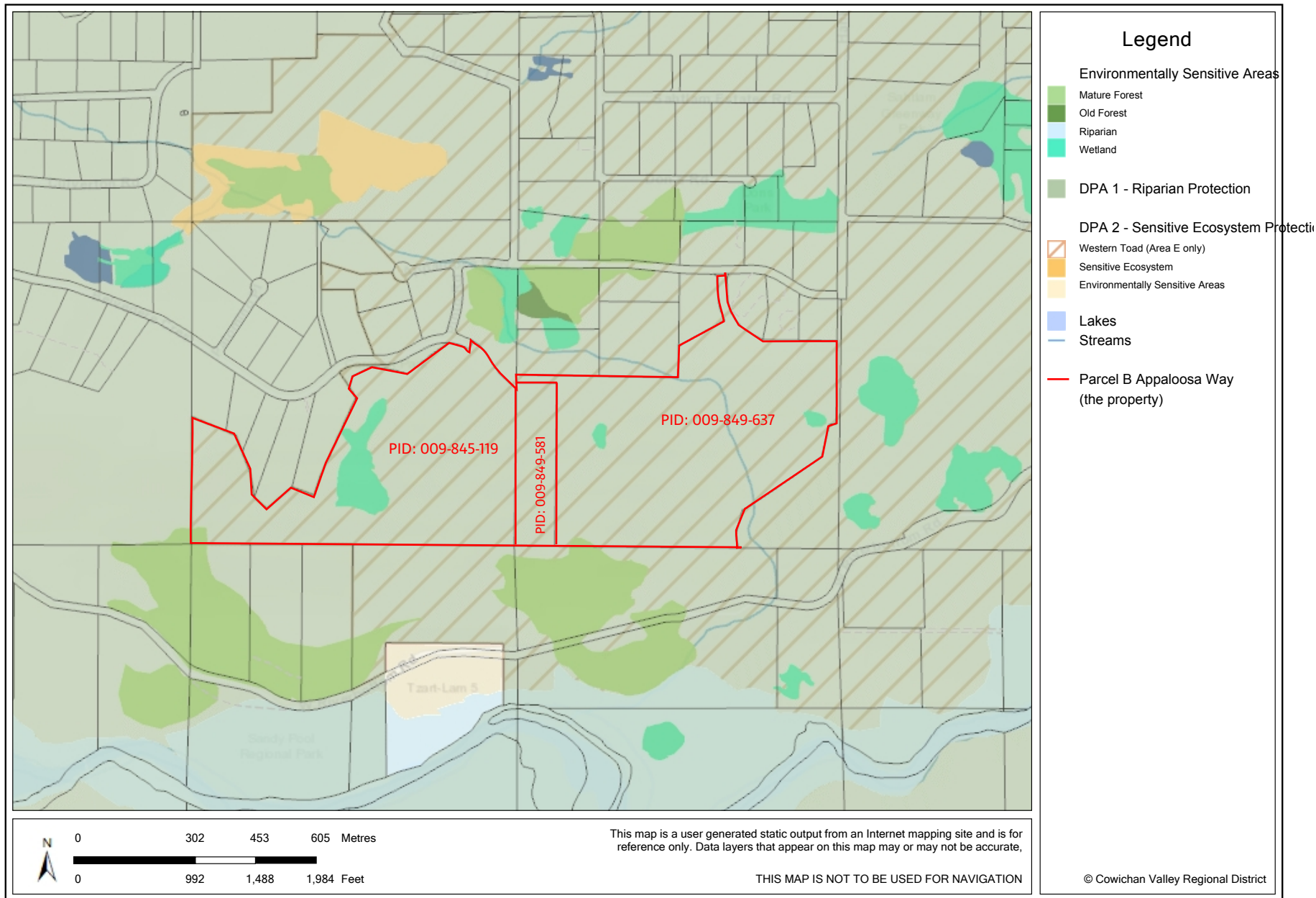
2 DEVELOPMENT PERMIT AREAS

The property is located within the CVRD, specifically within Electoral Area E. The property is overlapped by four CVRD development permit areas (DPAs): riparian, sensitive ecosystems, aquifer protection and wildfire hazard. This report will address the riparian and sensitive ecosystem DPAs.

Figure 1 shows the environmental DPAs overlapping the property and Table 1 outlines the primary considerations pertinent to this development. The designation and objectives of these DPAs are summarized below and can be found in full in Section 14.5 of the CVRD Official Community Plan (CVRD 2021a) and Schedule C of the CVRD Development Permit Areas (CVRD 2021b).

TABLE 2. ENVIRONMENTAL DEVELOPMENT PERMIT AREAS FOR PARCEL B APPALOOSA WAY

DPA	KEY REQUIREMENTS
DPA 1: Riparian Protection	<p><u>Subdivision</u></p> <p>RP9. At the time of subdivision, allocate an area at least 30 m in width from the high-water mark of the watercourse or top of ravine bank to be designated in the development permit to remain free of buildings, structures and alterations of land; designate the riparian assessment area in the development permit as an area that must remain free of development; and lay out subdivision parcels accordingly.</p> <p>RP10. Design subdivisions so that all parcels allow for a suitable building envelope and driveway that is set back from the riparian assessment area at least 7.5 m.</p> <p>RP11. Design subdivisions to avoid crossings of riparian areas and to maximize the distance between roads and riparian areas.</p> <p>RP12. Where a crossing of a riparian area is unavoidable, locate and design crossings to minimize the environmental impact.</p> <p>RP13. Design subdivisions to avoid disruption of wildlife corridors in riparian areas.</p>
DPA 2: Sensitive Ecosystem Protection	<p><u>Measures for Protecting Natural Attributes of Sensitive Areas</u></p> <p>SE1. Maintain a minimum 15 m natural buffer adjacent to sensitive ecosystem areas [...]</p> <p>SE2. Include in the environmental site plan measures to maintain connectivity and linkages with adjacent sensitive ecosystems and other habitat areas through the use of corridors and greenways to minimize fragmentation. [...]</p> <p>SE3. Where the development site contains or is adjacent to a natural watercourse a. prevent access to the watercourse by construction activities, except as approved by government agencies having jurisdiction; b. preserve and restore the watercourse to natural condition, including the planting and retaining of vegetation and trees to preserve and protect fish habitat and riparian areas, control drainage and erosion and protect banks; and c. ensure the environmental site plan complies with provisions of the B.C. Water Sustainability Act, Canada Fisheries Act and B.C. Riparian Areas Protection Regulation.</p> <p>SE4. Design and implement a sediment and erosion control plan to protect sensitive ecosystems from silt smothering of low-growing plants where land disturbance is planned or likely.</p> <p>SE5. Where utilities, servicing and infrastructure are required near sensitive ecosystems a. locate these works within sensitive ecosystem areas and associated buffers only where the installation is necessary, such as essential public roads, utilities, public works and pathways, and where there is no other physical alternative, by the determination of the local government; b. manage construction to avoid adverse effects on sensitive ecosystem functions and conditions; c. locate and design installations through the environmental site plan so that sensitive ecosystems can be maintained when adjacent lands are developed; and d. restore and enhance any disturbed sensitive ecosystems to maintain previously existing natural conditions and functions of the sensitive ecosystem.</p> <p>SE6. Use only native plant species where development occurs within or adjacent to a sensitive ecosystem, and do not use invasive plant species as identified by the Invasive Species Council of BC.</p> <p>SE7. Create and implement a plan to control the introduction or spread of invasive plant species. This plan may include removal of invasive species by hand clearing, pruning, mowing, excavation or other appropriate method. Disturbed sites are to be planted with appropriate native species.</p> <p>SE8. Avoid development activities in areas that would disturb wildlife during nesting and breeding seasons. Ensure that wildlife agencies and experts are consulted as necessary to determine the best times and practices for development.</p> <p>SE9. Minimize activities that disturb wildlife, compact or expose soils, or damage native vegetation, such as intensive recreation and livestock grazing. Where such activities are unavoidable, use designs that avoid public and livestock access to sensitive and important ecosystems (e.g., via roads and trails).</p> <p>SE10. Minimize the presence of trails and other crossings within environmentally sensitive areas or sensitive ecosystems.</p>



3 PROVINCIAL AND FEDERAL REGULATIONS

The provincial and federal legislation in Table 2 may apply to the project. Mitigation measures provided later in this report are designed to comply with the applicable legislation as required.

TABLE 3. PROVINCIAL AND FEDERAL LEGISLATION

LEGISLATION	YEAR	SUMMARY	REQUIREMENTS ¹
PROVINCIAL			
Riparian Areas Protection Regulation	2019	Protect the many and varied features, functions and conditions (FCCs) 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.”	The RAPR report will be finalized when the development plan is finalized. The report is valid for 5 years, however, any significant changes to the development plan must be reassessed and incorporated.
Water Sustainability Act	2016	Protects the quality of water, fish and wildlife habitat, and the rights of licensed water users. Any activities that result in changes in or about a stream require notification or approval under Section 11	Notification or approval under Section 11 for stream crossings.
Weed Control Act	1996	Designates provincially and regionally noxious weeds (Schedule A). Provides guidelines for noxious weed prevention and management and imposes a responsibility on all land occupiers to control designated noxious plants.	Apply best practices to prevent spread of weeds.
Wildlife Act; Wildlife Amendment Act	1996, 2004	Protects vertebrate animals from direct harm, except as allowed by regulation within B.C. (e.g. hunting, trapping). This includes all active bird nests.	Avoid or mitigate activities that may impact wildlife (see sdkl;fjadkls).
FEDERAL			
Fisheries Act	2019	Prohibits the harmful alteration, disruption or destruction of fish habitat (HADD). Includes, but not limited to, the release of a deleterious substance.	Considered in WSA Section 11 notification/application.
Species At Risk Act (SARA)	2002	Provides legal protection for wildlife and wildlife habitat as designated under Schedule 1 of the Act.	n/a
Migratory Bird Convention Act	1994	Protects migratory birds and nests from indiscriminate harvesting and destruction.	If disturbance of vegetation is to occur during the sensitive nesting period for migratory birds, a pre-disturbance nest survey by a biologist is required.

¹Potentially required for the project activities.

4 SCOPE OF WORK AND METHODOLOGY

Asio Environmental Consulting was engaged to complete an environmental assessment of the property to specifically address the requirements of the development permit areas. Background information was reviewed and site conditions were documented during a field assessment. The following biophysical features were considered in this report:

- Areas of sensitivity, including aquatic ecosystems and riparian areas.
- Areas of habitat and biodiversity values.
- Plant communities and plant species in the area.
- Wildlife presence and wildlife habitat.

The impacts of the riparian disturbance and the future restoration activities on the environmental features were assessed and specific mitigation to reduce any residual impacts have been recommended.

5 DESKTOP REVIEW

A desktop review of existing data was completed to reveal known occurrences of species at risk and fish species on or near the property.

5.1 ECOSYSTEM DESCRIPTION

The property is located within the Moist Maritime subzone of the Coastal Douglas-fir biogeoclimatic zone (CDFmm; Province of BC 2022a). This ecosystem is typically dominated by Douglas-fir trees, with some grand fir, western redcedar, and bigleaf maple. The understory within this zone typically contains salal, dull Oregon-grape, sword fern and red huckleberry (Green and Klinka 1994). A well-developed moss layer is generally present, particularly in riparian areas.

5.2 SPECIES AT RISK

No species or ecosystems at risk occurrence records overlap the property. Nearby occurrences include red-listed ecosystems, red listed species, and blue-listed species (Table 3; BC CDC 2022a).

TABLE 4. SPECIES AT RISK IN THE VICINITY OF THE PROPERTY

ENGLISH NAME	SCIENTIFIC NAME	BC STATUS ¹	FEDERAL STATUS ²
SPECIES AT RISK			
Dun Skipper	<i>Euphyes vestris</i>	Blue	Threatened
Three-way sedge	<i>Dulichium arundinaceum</i>	Red	
ECOSYSTEMS AT RISK			
Black cottonwood - red alder/salmonberry	<i>Populus trichocarpa</i> - <i>Alnus rubra</i> / <i>Rubus spectabilis</i>	Blue	--
Grand fir/dull Oregon-grape	<i>Abies grandis</i> / <i>Mahonia nervosa</i>	Red	
Labrador-tea / western bog-laurel / peat-mosses	<i>Rhododendron groenlandicum</i> / <i>Kalmia microphylla</i> / <i>Sphagnum</i> spp.	Blue	

ENGLISH NAME	SCIENTIFIC NAME	BC STATUS ¹	FEDERAL STATUS ²
Red alder/salmonberry/common horsetail	<i>Alnus rubra</i> / <i>Rubus spectabilis</i> / <i>Equisetum arvense</i>	Blue	
Red alder/slough sedge [black cottonwood]	<i>Alnus rubra</i> / <i>Carex obnupta</i> [<i>Populus trichocarpa</i>]	Red	
Western redcedar / common snowberry	<i>Thuja plicata</i> / <i>Symphoricarpos albus</i>	Red	
Western redcedar / common snowberry	<i>Thuja plicata</i> / <i>Symphoricarpos albus</i>	Red	
Western redcedar / salmonberry	<i>Thuja plicata</i> / <i>Rubus spectabilis</i>	Red	

5.3 FISH OCCURRENCE RECORDS

The only stream that is mapped on the property in the provincial databases is a tributary to the Cowichan River. Several wetland complexes and streams are tributaries to that stream and were mapped as part of this assessment. The new streams are detailed in the Field Results Section below.

The BC HabitatWizard database was searched and there are no occurrence records in the previously mapped stream that crosses the property. The Cowichan River, into which the watercourses on the property flow, has records of coho salmon, chum salmon, chinook salmon, rainbow trout, and threespine stickleback within a kilometre of the property (Province of BC 2022b).

6 FIELD RESULTS

A qualified professional biologist (R.P.Bio) from Asio Environmental Consulting completed a number of site surveys and inventory on the property between February and August 2023. The riparian area and aquatic ecosystems, and other potentially sensitive ecosystems, were assessed – including the collection of stream data, vegetation and wildlife observations, and site photographs.

6.1 RIPARIAN AREAS AND AQUATIC ECOSYSTEMS

A total of 19 wetlands and 15 stream and stream segments were mapped on the property (Figure X). Each watercourse segment or waterbody is described in Table 4. Several of the wetlands are low saturated areas but are isolated from the stream network.

TABLE 5. WETLANDS AND WATERCOURSES THE PROPERTY

LABEL	DESCRIPTION	RAA ¹	SPEA ²
Wetland A	Large wetland within the covenant on the western part of the properties. Drains into stream 1. This wetland is located within the covenant.	30m	15-30m
Wetland B	Isolated wetland in low-lying area. No connection to other watercourse or waterbody; not RAPR eligible.	n/a	n/a
Wetland C	Small shrubby wetland at the head of stream 2.	30m	15-30m
Wetland D	Large wetland with marshy open water in deciduous forest at the north and shrubby emergent vegetation covering the southern 2/3 of the area.	30m	15-30m
Wetland E	Small open water wetland in the forest. Connects directly to wetland F.	30m	15-30m
Wetland F	Large wetland with some open water and some shrubby emergent vegetation.	30m	15-30m
Wetland G	Large marsh with some areas of open water.	30m	15-30m
Wetland H	Large wetland with some open water and some shrubby emergent vegetation.	30m	15-30m
Wetland I	Isolated wetland in low-lying area. No connection to other watercourse or waterbody; not RAPR eligible.	n/a	n/a
Wetland J	Large wetland with some open water and some shrubby emergent vegetation.	30m	15-30m
Wetland K	Large wetland with some open water and some shrubby emergent vegetation.	30m	15-30m
Wetland L	Isolated wetland in low-lying area. No connection to other watercourse or waterbody; not RAPR eligible.	n/a	n/a
Wetland M	Large wetland with deep open water and stumps from wetland creation due to historical road building.	30m	15-30m
Wetland N	Isolated wetland in low-lying area. No connection to other watercourse or waterbody; not RAPR eligible.	n/a	n/a
Wetland O	Shrubby wetland.	30m	15-30m
Wetland P	Shrubby wetland	30m	15-30m
Wetland Q	Small muddy wetland with emergent vegetation. Fed by small stream from the north. Discharge could not be determined at time of survey.	30m	15-30m
Wetland R	Isolated wetland in low-lying area. No connection to other watercourse or waterbody; not RAPR eligible.	n/a	n/a
Wetland S	Isolated wetland in low-lying area. No connection to other watercourse or waterbody; not RAPR eligible.	n/a	n/a
Wetland T	Shrubby wetland in low-lying area between the existing logging road and Stream 9.	30m	15-30m
Stream 1	Permanent stream in small gully. Stream is rocky and average width is approximately 3 m.	30m	10m
Stream 2	Permanent stream in small gully. Stream is rocky and average width is approximately 1.5 m.	30m	10m
Stream 3	Small ditch that connects the two large wetlands. Ditch is cut through existing road.	30m	10m
Stream 4	Small stream that flows through the forest between large wetlands.	30m	10m
Stream 5	Tributary to Stream 9 that drains from wetland G. Stream is shallow and wide on the flat plateau and then steep and narrow into the ravine.	30m	10m
Stream 6	Seasonal drainage that carries overflow from wetland J into the ravine and stream 9.	30m	10m
Stream 7	Seasonal drainage that connects wetland H and K	30m	10m
Stream 8	Seasonal drainage that carries overflow from wetland K into the ravine and stream 9.	30m	10m
Stream 9	Moderately sized stream in a ravine. Stream is shallow and rocky. Has a riffle-pool structure with the exception of infrequent small cascades over rocks and debris. Average width is approximately 5 m. This stream is a tributary to the Cowichan River (joins off property to the south).	30m	20m
Stream 10	Tributary to stream 9. Drains from wetland M. Narrow rocky stream.	30m	10m
Stream 11	Small muddy stream that flows into wetland O.	30m	10m
Stream 12	Seasonal stream that connects wetland O and P.	30m	10m
Stream 13	Small seasonal outflow from wetland P.	30m	10m
Stream 14	Small seasonal stream that flows into wetland Q.	30m	10m
Stream 15	Small stream that drains from wetland T into stream 9 to the north of the property.	30m	10m

¹ the riparian assessment area for a stream consists of a 30 m strip on each side of the stream, measured from the stream boundary.² details of the calculation of the SPEA will be provided in the RAPR assessment report

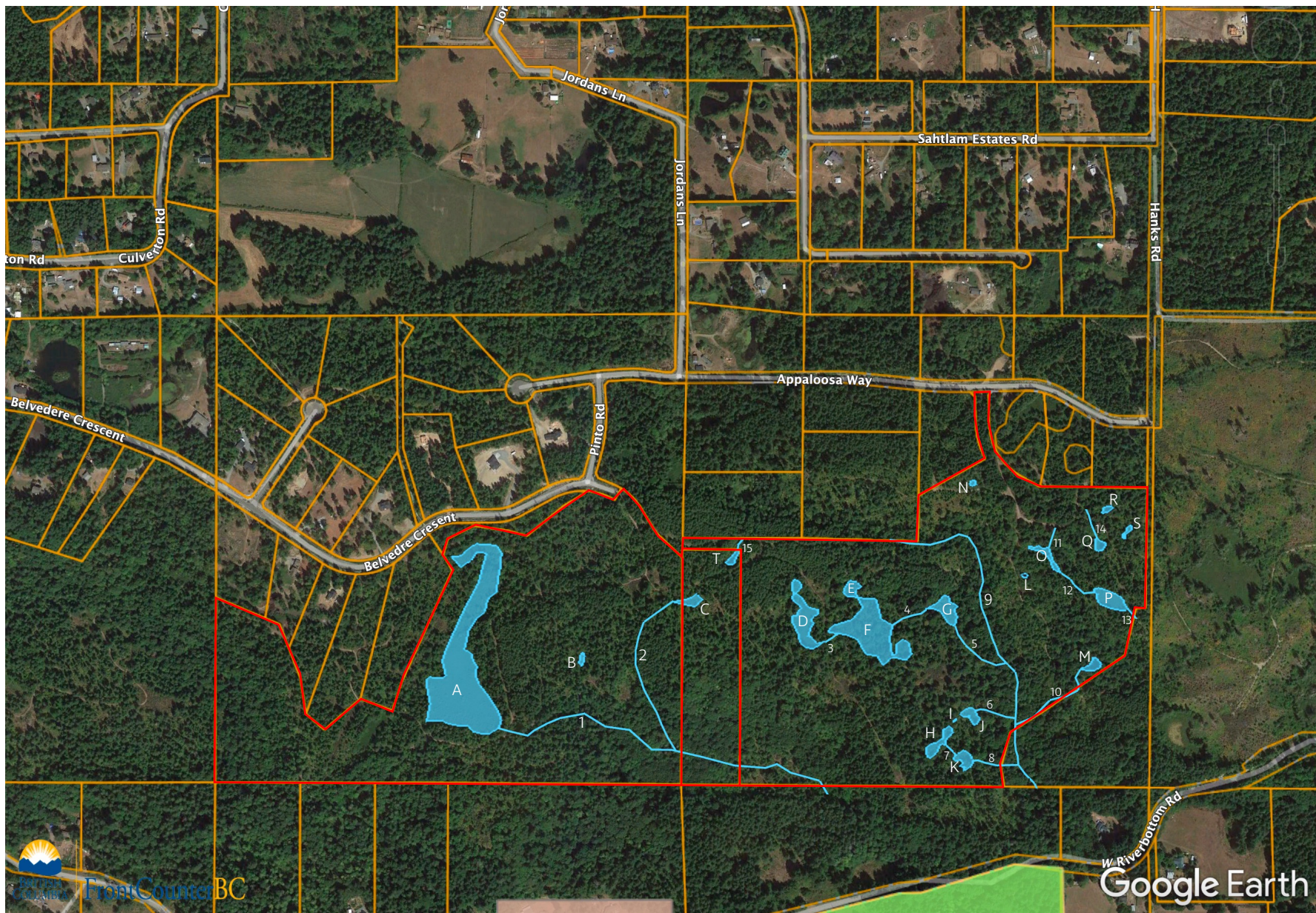


FIGURE 2. WATERCOURSES AND WETLANDS AT PARCEL B APPALOOSA WAY

- Wetlands
- Streams
- Parcel boundaries

PROPOSED
SUBDIVISION

DU-APP GP LTD.

PARCEL B (DD86568I) OF
SECTION 7, RANGE 7, SAHTLAM
DISTRICT, EXCEPT PART IN
PLAN EPP18482, EPP26101
AND EPP67975
SECTION 7, RANGE 6, SAHTLAM
DISTRICT, EXCEPT PART IN
PLAN EPP18482

THE WEST 5 CHAINS OF THE
SOUTH 20 CHAINS, SECTION 7,
RANGE 7, SAHTLAM DISTRICT,
OUTLINED IN RED ON
PLAN DD 27868I

ADDRESS : APALOOSA WAY,
DUNCAN, B.C.

PROJECT SURVEYOR : D.W. HOLME

DRAWN BY : CDB DATE : AUG. 8/23

OUR FILE : 90625 REVISION :

JEA

J.E. ANDERSON
& ASSOCIATES
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1A - 3411 SHENTON ROAD, NANAIMO, B.C. V9T 2H1
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EMAIL: nanaimo@jeanderson.com
NANAIMO - VICTORIA - PARKSVILLE - CAMPBELL RIVER

LEGEND

ALL DIMENSIONS ARE IN METRES

SUBJECT TO CHARGES SHOWN
ON TITLE NO. CB519066
(P.I.D. 009-849-637)

ON TITLE NO. CB519068
(P.I.D. 009-845-119)

ON TITLE NO. CB519067
(P.I.D. 009-849-581)

DIMENSIONS ARE DERIVED FROM
LAND TITLE OFFICE RECORDS

THIS PLAN HAS BEEN PREPARED IN
ACCORDANCE WITH THE PROFESSIONAL
REFERENCE MANUAL

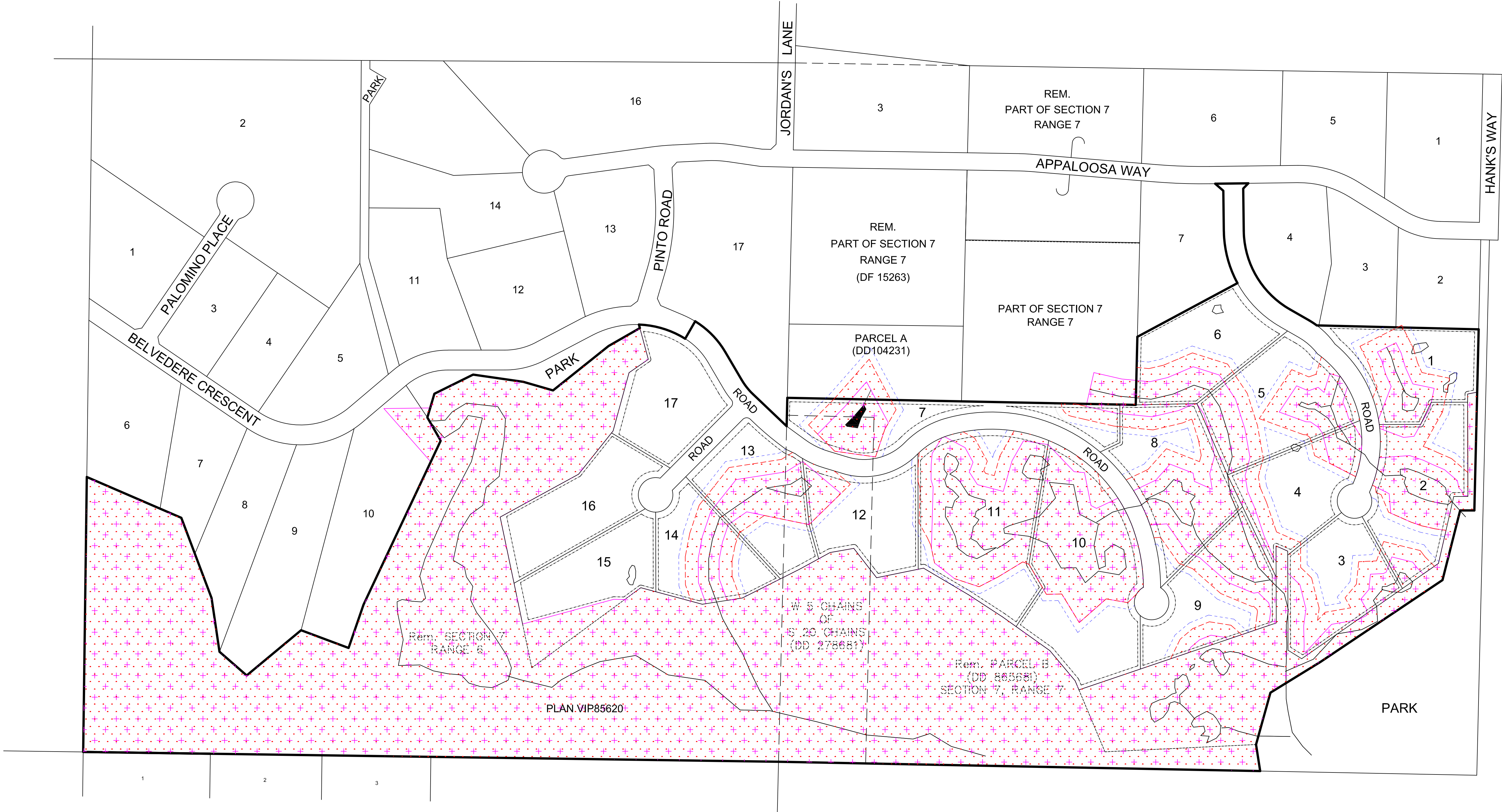
CVRD ZONING SETBACK

— STREAMSIDE PROTECTION AND
ENHANCEMENT AREA (SPEA)

— RIPARIAN ASSESSMENT AREA

7.5 METRE RP10 SETBACK

LOT	AREA	USEABLE AREA
1	1.40 ha	1.05 ha
2	1.73 ha	1.00 ha
3	1.37 ha	1.03 ha
4	1.36 ha	1.03 ha
5	1.75 ha	1.02 ha
6	1.46 ha	1.16 ha
7	1.52 ha	1.14 ha
8	1.85 ha	1.00 ha
9	1.60 ha	1.03 ha
10	2.77 ha	1.18 ha
11	2.62 ha	1.00 ha
12	1.18 ha	1.03 ha
13	1.55 ha	1.06 ha
14	1.27 ha	1.02 ha
15	1.20 ha	1.17 ha
16	1.42 ha	1.42 ha
17	1.33 ha	1.33 ha



6.2 VEGETATION AND WILDLIFE OBSERVATIONS

The property is mostly forested, predominantly mature, second growth forest (Douglas-fir, grand fir, western redcedar, red alder, and bigleaf maple trees) with an understory dominated by sword ferns and salal. There are a number of openings due to historical clearing and use. These areas are dominated by scotch broom and other weedy species. The wetlands on the property are mostly shrubby, dominated by hardhack, or marshy, dominated by sedges. Riparian areas adjacent to the wetlands and streams contain salmonberry, sword fern and bracken fern. During the site assessments the species in Table 1 were found on the site.

TABLE 6. VEGETATION SPECIES OBSERVED AT PARCEL B APPALOOSA WAY

COMMON NAME	SCIENTIFIC NAME	SPECIES STATUS
TREES AND SHRUBS		
Bigleaf maple	<i>Acer macrophyllum</i>	Yellow ¹
Douglas-fir	<i>Pseudotsuga menziesii</i>	Yellow ¹
Dull Oregon-grape	<i>Berberis nervosa</i>	Yellow ¹
Grand fir	<i>Abies grandis</i>	Yellow ¹
Hardhack	<i>Spiraea douglasii</i> var. <i>douglasii</i>	Yellow ¹
Nootka rose	<i>Rosa nutkana</i>	Yellow ¹
Oceanspray	<i>Holodiscus discolor</i> var. <i>discolor</i>	Yellow ¹
Pacific dogwood	<i>Cornus nuttallii</i>	Yellow ¹
Baldhip rose	<i>Rosa gymnocarpa</i>	Yellow ¹
Red alder	<i>Alnus rubra</i>	Yellow ¹
Salal	<i>Gaultheria shallon</i>	Yellow ¹
Salmonberry	<i>Rubus spectabilis</i>	Yellow ¹
Thimbleberry	<i>Rubus parviflorus</i>	Yellow ¹
Trailing blackberry	<i>Rubus ursinus</i>	Yellow ¹
Western hemlock	<i>Tsuga heterophylla</i>	Yellow ¹
Western redcedar	<i>Thuja plicata</i>	Yellow ¹
Willow sp.	<i>Salix</i> sp.	--
FORBS, FERNS AND GRAMNOIDS		
Bracken fern	<i>Pteridium aquilinum</i>	Yellow ¹
Cleavers	<i>Galium aparine</i>	Yellow ¹
Common horsetail	<i>Equisetum arvense</i>	Yellow ¹
Fringecup	<i>Tellima grandiflora</i>	Yellow ¹
Licorice fern	<i>Polypodium glycyrrhiza</i>	Yellow ¹
Orange honeysuckle	<i>Lonicera ciliosa</i>	Yellow ¹
Pacific bleeding heart	<i>Dicentra formosa</i> ssp. <i>formosa</i>	Yellow ¹
Pacific water parsley	<i>Oenanthe sarmentosa</i>	Yellow ¹
Red columbine	<i>Aquilegia formosa</i>	Yellow ¹
Sedge sp.	<i>Carex</i> sp.	--
Siberian miner's lettuce	<i>Claytonia sibirica</i>	Yellow ¹
Skunk cabbage	<i>Lysichiton americanus</i>	Yellow ¹
Slough sedge	<i>Carex obnupta</i>	Yellow ¹

COMMON NAME	SCIENTIFIC NAME	SPECIES STATUS
Starflower	<i>Lysimachia latifolia</i>	Yellow ¹
Stinging nettle	<i>Urtica dioica</i>	Yellow ¹
Sword fern	<i>Polystichum munitum</i>	Yellow ¹
Vanilla leaf	<i>Achlys triphylla</i>	Yellow ¹
INVASIVE SPECIES AND EXOTIC SPECIES		
Canada thistle	<i>Cirsium arvense</i>	Invasive; Exotic
Cut-leaf blackberry	<i>Rubus laciniatus</i>	Exotic
Hairy cat's ear	<i>Hypochaeris radicata</i>	Exotic
Scotch broom	<i>Cytisus scoparius</i>	Invasive; Exotic
BRYOPHYTES		
Coastal leafy moss	<i>Plagiomnium insignis</i>	Yellow ¹
Electrified cat's-tail moss	<i>Rhytidiadelphus triquetrus</i>	Yellow ¹
Flat-moss	<i>Buckiella undulata</i>	Yellow ¹
Haircap moss	<i>Polytrichum piliferum</i>	Yellow ¹
Oregon beaked moss	<i>Kinbergia oregana</i>	Yellow ¹
Step moss	<i>Hylocomium splendens</i>	Yellow ¹
Tree ruffle liverwort	<i>Porella navicularis</i>	Yellow ¹

¹ BC CDC 2021

The property provides abundant and varying wildlife habitat. The property's mature trees provide nesting, roosting and foraging habitat for forest songbirds, owls and woodpeckers. The shrubs in the riparian area may provide nesting and foraging habitat for water-associated birds and mammals, and breeding and terrestrial habitat for amphibians and reptiles. A list of the animal species observed during the field visits is provided in Table 3.

TABLE 7. WILDLIFE SPECIES OBSERVED AT PARCEL B APPALOOSA WAY

COMMON NAME	SCIENTIFIC NAME	SPECIES STATUS
BIRDS		
American robin	<i>Turdus migratorius</i>	Yellow ¹
Chestnut-backed chickadee	<i>Poecile rufescens</i>	Yellow ¹
Crow	<i>Corvus brachyrhynchos</i>	Yellow ¹
Dark-eyed junco	<i>Junco hyemalis</i>	Yellow ¹
Marsh wren	<i>Cistothorus palustris</i>	Yellow ¹
Pacific wren	<i>Troglodytes pacificus</i>	Yellow ¹
Pileated woodpecker	<i>Dryocopus pileatus</i>	Yellow ¹
Song sparrow	<i>Melospiza melodia</i>	Yellow ¹
Swainson's thrush	<i>Catharus ustulatus</i>	Yellow ¹
Varied thrush	<i>Ixoreus naevius</i>	Yellow ¹
MAMMALS		
Black bear	<i>Ursus americanus</i>	Yellow ¹
Black-tailed deer (scat)	<i>Odocoileus hemionus columbianus</i>	Yellow ¹
Cougar	<i>Puma concolor</i>	Yellow ¹
Red squirrel	<i>Tamiasciurus hudsonicus</i>	Yellow ¹

Roosevelt elk	<i>Cervus elaphus roosevelti</i>	Blue ¹
AMPHIBIANS AND REPTILES		
Northern red-legged frog	<i>Rana aurora</i>	Blue ¹ ; Special Concern ²
Northwestern gartersnake	<i>Thamnophis ordinoides</i>	Yellow ¹
Pacific tree frog	<i>Pseudacris regilla</i>	Yellow ¹
Western toad	<i>Anaxyrus boreas</i>	Yellow ¹ ; Special Concern ²

¹ BC CDC 2021

7 ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

The disturbance from the future development of the property may have impacts on the environment (Table 8), specifically:

- Disturbance in sensitive ecosystem areas, such as riparian habitat,
- Loss of vegetation,
- Spread of invasive and exotic plant species,
- Change in wildlife habitat availability and wildlife mortality risk, and
- Sediment movement in the project area that may impact wetlands and watercourses.

TABLE 8. POTENTIAL IMPACTS OF ACTIVITIES ON THE PROPERTY

POTENTIAL IMPACT	MECHANISMS OF IMPACT
Disturbance in sensitive ecosystem areas (e.g., riparian habitat)	The removal of vegetation in the riparian area can result in the loss of features, functions and conditions that are vital for maintaining stream health and productivity. This may include sources of large organic debris, such as fallen trees and tree roots; vegetative cover and shade to help moderate water temperature; provision of food, nutrients and organic matter to the stream; stream bank stabilization; and buffers for streams from excessive silt and surface run-off pollution.
Loss of 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 in the riparian area immediately adjacent to cleared areas may experience changes to the canopy structure and understory plant species due windthrow and increased light and moisture penetration.
Spread of invasive plant species	Invasive plants are particularly adept at colonizing degraded plant communities and disturbed soils. 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 of native species by monopolizing on open spaces and occupying habitats.
Change in wildlife habitat availability and wildlife mortality risk,	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. Removal of riparian habitat can result in the direct loss of habitat for wildlife species that specifically require riparian vegetation and proximity to water. Damage or degradation of soil surfaces can increase soil compaction, resulting in changes to turtle terrestrial and nesting habitat. The area has a significant amount of previous disturbance, reducing the current habitat quality. Restoration may improve the habitat for painted turtles beyond the current value.

POTENTIAL IMPACT	MECHANISMS OF IMPACT
Sediment movement in the project area towards wetlands and watercourses.	Removal of vegetation can expose soils to erosion and can result in the movement of sediment. Sediment may enter the stream, causing changes in light penetration, pH and turbidity. Damage or degradation of soil surfaces can result in loss of soil structure, increased erosion, and soil compaction, which can negatively affect reclamation efforts.

The residual environmental impacts of the future development activities on the property will be reduced by the implementation of the mitigation and restoration measures recommended in the sections below. Mitigation measures were developed according to the mitigation hierarchy: 1) avoid, 2) minimize, and 3) restore (BC Ministry of Environment 2014) and include provincial best management practices (BC MOE 2014, BC Ministry of Water, Land and Air Protection 2004a, b).

Riparian Protection

The SPEA must be a non-disturbance area, except for invasive species removal by hand and removal or modification of danger trees, to be completed under supervision of a certified arborist and QEP. No native trees or shrubs should be removed from the SPEA or disturbed during road building or site preparation activities. If work require in or about a stream (e.g., road crossings) is required, contact the province prior to commencing work to discuss submission of a Section 11 notification or application to the province under the Water Sustainability Act (note: notifications have a 45-day review period).

As per the RAPR Technical Manual, in order to maintain and protect the integrity of the SPEA from development activities, site-specific measures to protect the SPEA must be identified, including tree protection zones, a windthrow buffer, and protection of steep slopes. Some measures will result in areas beyond the preliminary SPEA being identified as areas requiring special protection, or limited activity, to maintain integrity of the SPEA. These measures mitigate any potential hazards posed by the proposed development to natural features, functions or conditions in the SPEA (Table 9).

TABLE 9. MEASURES TO PROTECT THE SPEA

ASPECT	MITIGATION MEASURES
Danger trees	If the snag or any other trees of concern are identified in the RAA or SPEA during site preparation activities, a certified arborist or professional forester needs to be obtained to confirm the tree(s) as a danger prior to any removal by a certified arborist. If danger trees are identified, the riparian QEP will provide recommendations and mitigation to protect the integrity of the SPEA during danger tree modification or removal.
Windthrow	Where previous clearings exist, the remaining few trees have been exposed to varying annual wind conditions and are therefore likely windfirm. A 5m windthrow buffer will be added to the SPEA for new clearings, in which the windfirmness of trees shall be determined to prevent windthrow along the edge of the SPEA.
Slope stability	The design of the site avoided steep (>30%) slopes on the property. The steep slope in the south portion of the property will remain undisturbed as it is located within the covenant. Other steep slopes are located within the ravine and will be protected by the SPEA. Exposed soils on the property should be stabilized by the planting of native vegetation species including trees and shrubs.

ASPECT	MITIGATION MEASURES
Protection of trees	The edge of the SPEA will be clearly marked to ensure that trees within the SPEA are protected. Where trees in the SPEA have root zones that extend outside of the SPEA, the fencing should be placed so as to protect the root zones of trees. A general rule of thumb is the crown canopy matches the root protection area.
Encroachment	The edge of the SPEA must be clearly marked with snow fencing to ensure that no encroachment of clearing, site preparation or construction activities into the SPEA will occur unless permitted under Section 11 of the WSA.
Sediment and erosion control	Site specific controls have been developed based on a site visit and experience from past projects. The erosion control measures are provided in the Sections below.
Stormwater management	Additional overland drainage will occur during storm and rainfall events due to the clearing of the site and addition of impermeable surfaces. Erosion and sediment controls discussed below will be used to prevent contaminated run-off from entering the aquatic ecosystem. Stormwater management planning for the project will include dissipation of run-off that is intercepted by buildings outside the SPEA into vegetated areas (as per the Riparian Assessment Manual). A detailed stormwater management plan will be submitted to the City of Langford as part of the permitting process to meet the local municipal requirements for an engineered rainwater management design.
Floodplain concerns (channel mobility)	The streams on the property are largely constrained by topography, and therefore, changes in the stream boundary are unlikely to occur. Within the flat wetland complex areas, changes in the stream boundary are likely to be contained within the larger SPEAs of the wetlands.

Invasive Weeds

Invasive weed control is difficult for established populations. Species should be removed using the most appropriate methods, at the correct time of year, and plant material must be disposed of correctly to avoid re-establishment or spread. Following removal, re-seed bare soil with desirable, competing vegetation. For some species, chemical control is possible but not recommended due to the sensitive riparian ecosystem adjacent to the property.

Scotch broom removal should occur mid-April through early June, before its seed pods begin to open. 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. Avoid disturbing the soil which can stimulate dormant broom seeds to sprout. Invasive species should be bagged and disposed of properly in a landfill.

Mitigation measures to control and minimize the spread of invasive weeds on the site include:

- Clean all machinery before arrival onto the site to ensure that more weed seeds and other propagules (e.g. pieces of root) are not brought into the project area.
- Use available fill and soil from on site where possible. If fill or topsoil is imported from external areas, ensure that it is from a weed-free source.

Areas disturbed by road buildings and site servicing that are not part of the permanent road or service footprint should be replanted with native trees and shrubs and/or seeded with native seed mix (e.g., clover, Coastal Revegetation Mix by Pacific Premier, or

equivalent). Overall plant density should be approximately one plant per 1 to 2 m². Native vegetation species that should be considered for revegetation include sword ferns, nootka rose, salmonberry and salal. The purpose of using native species is to not require irrigation in the future. The optimal time for revegetation is in the fall, prior to the wet winter season. However, planting at any time of the year (with irrigation as needed) is acceptable to prevent invasive species.

Wildlife and Wildlife Habitat

Mitigation measures to minimize impacts on wildlife and wildlife habitat include:

- Avoid or limit the removal of established trees and shrubs, where possible. No trees will be removed in the SPEA.
- Vegetation alteration or danger tree removal should be completed outside of the migratory bird window (early-March to mid August; Government of Canada 2022).
- If vegetation clearing, including tree cutting, brushing, or clearing and grubbing, is scheduled within the sensitive time period for breeding birds, a QEP should conduct nest search surveys prior to the start of activities 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 an active nest is discovered during nest search or site preparation activities, the nest will be subject to site-specific mitigation measures (e.g. protective buffer around the nest or unobtrusive monitoring) until the young have naturally fledged/left the area.
- 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.
- 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.

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 to minimize the potential effects of the project on the natural environment.

- 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.
- Regularly inspect and maintain the erosion and sediment control measures during all activities.

- Store materials and soils in dry, flat areas at least 15m outside the edge of the SPEA.
- 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.
- Keep the erosion and sediment control measures in place until all disturbed ground has been permanently stabilized with native plant revegetation.
- Minimize amount of time soils are exposed by seeding and planting as soon as disturbance is complete. Cover exposed soil areas with tarps or mulch if for a prolonged period or during rainfall events.

Work in or about a Stream

If work require in or about a stream is required for road crossings or site preparation, Section 11 notification or application will be submitted to the province under the Water Sustainability Act (note: notifications have a 45-day review period). The following mitigation measures should be implemented to minimize the impacts of the road crossing installation on the riparian area and aquatic ecosystem.

- Protect soil from compaction and rutting by laying down mats or pads for heavy machines or vehicles to travel over.
- Keep an emergency spill kit on site, including absorbent pads (hydrocarbons and antifreeze), absorbent socks (oil, gas & diesel), granular bentonite absorbent (peat moss equivalent is acceptable), hazmat disposal bags, large nitrile gloves and a spill instruction sheet.
- In case of a spill, stop work and containing deleterious substances to prevent dispersal.
- Report any spills of oil, fuel or other deleterious material including sediment.
- Clean up and appropriately dispose of spilled deleterious substances.
- Maintain all machinery on site in a clean condition and free of fluid leaks.
- Wash, refuel and service machinery and store fuel and other materials for the machinery at least 30 m from the high-water mark.
- If water is present in the stream, an isolation bypass and pump technique should be implemented to prevent sedimentation of the watercourse and downstream aquatic environment.

8 CONCLUSION

The observations from multiple 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 during the field visits to date. Two amphibian species at risk were observed, highlighting the need for the included riparian and wetland protection actions. Subsequent field visits should be completed to update the biophysical observations and refine the riparian protection measures as the development planning is finalized and prior to the beginning of site preparation activities.

During the future development at Parcel B Appaloosa Way, 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.

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PROFESSIONAL CERTIFICATION

This report has been prepared with the best information available at the time of writing, including the Official Community Plan, communications with the client, site visits, and review of other documentation relevant to the project. This report 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.

9 REFERENCES

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10 APPENDIX A – SITE PHOTOS

PHOTO 1. STEEP SLOPE LOOKING DOWN TO STREAM 2 NEAR ITS CONFLUENCE WITH STREAM 1;



PHOTO 2. EXISTING ROAD OVERGROWN WITH SCOTCH BROOM



PHOTO 3. MARSHY WETLAND AT THE TOP OF WETLAND D



PHOTO 4. SHRUBBY WETLAND D



PHOTO 5. WILDLIFE SNAG IN THE RIPARIAN AREA OF WETLAND H



PHOTO 6. STREAM 9



PHOTO 7. STEEP SLOPE OF THE RAVINE CONTAINING STREAM 9



PHOTO 8. WETLAND M AT THE TOP OF STREAM 10



PHOTO 9. STREAM 10

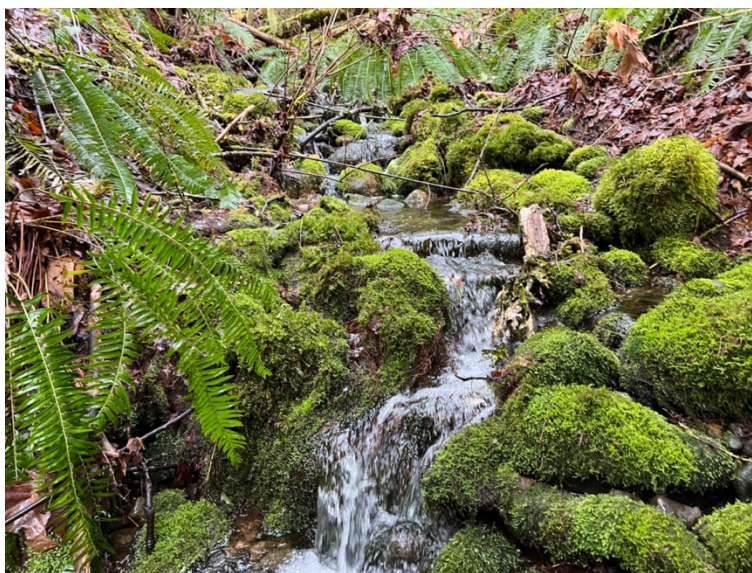


PHOTO 10. WETLAND G



PHOTO 11. DENSE UNDERSTORY IN UPLAND FOREST

