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DP-18-11 – Pattison

REPORT TO THE JUAN DE FUCA LAND USE COMMITTEE
MEETING OF TUESDAY, AUGUST 16, 2011

SUBJECT **DEVELOPMENT PERMIT WITH VARIANCE AND FLOODPLAIN EXEMPTION FOR LOT 113, SECTION 95, RENFREW DISTRICT, PLAN VIP26054**

ISSUE

The purpose of this report is to request a development permit with variance and floodplain exemption for the purpose of permitting the construction of a driveway, single family dwelling and carport with septic field.

BACKGROUND

The 0.39ha property is located on Denewood Place in Shirley and is zoned Rural Residential 2 (RR-2) (Appendix 1). The property was created by subdivision in 1972 and remains vacant. Adjacent properties are also zoned RR-2 and have existing residential uses. Goudie Creek flows through the center of the subject property; a 30m development permit area setback and floodplain regulations apply to the watercourse. Previous requests have been made to establish a building envelope on the property (BVJ-12-01, BVJ-04-07 and DP-15-07); however, no approvals were granted due to concerns over slope stability, riparian impacts and sewage disposal.

Due to the very limited building envelope on the property, the owner is again requesting a development permit with variance to relax the front yard setback of the RR-2 zone from 7.5m to 6m and to relax the side yard setback from 6m to 1.5m for the purpose of constructing a house and carport (Appendix 2). The owner has submitted an environmental report, a tree assessment report, a geotechnical report and a sewage treatment report in support of the application (Appendices 3 and 4).

ALTERNATIVES

1) Approve the development permit with variance and floodplain exemption to relax the front yard setback from 7.5m to 6m and the side yard setback from 6m to 1.5m for the purpose of constructing a residence and carport.

2) Deny the development permit with variance and floodplain exemption for the purpose of constructing a residence and carport.

3) Request additional information from the applicant.

LAND USE IMPLICATIONS

Goudie Creek, a licensed drinking water supply, flows through the center of the property. Although the property has not been identified as being within a development permit area in Bylaw No. 3352, The Official Community Plan (OCP) for Shirley / Jordan River, Section 4.10.6 of the bylaw states that: "*notwithstanding the areas identified on Map 3b, the actual Development Permit Area No. 3: Watercourses, Wetlands and Riparian Areas will in every case be verified and measured on the ground.*" Further, the watercourse is subject the *Provincial Riparian Areas Regulation* (RAR). Accordingly, the 30m riparian setback and development permit guidelines as outlined in Section 4.10.6 of the OCP apply to the site. The applicant has submitted a Riparian Assessment Report pursuant to the RAR from Swell Environmental Consulting Ltd. (Appendix 3).

The environmental report describes the site as having mature second-growth forest with an intact stream channel showing no evidence of excessive erosion or deposition. The report includes a tree assessment and recommendations for managing stand integrity and minimizing windthrow. The biologist recommends that no trees should be removed from the Streamside Protection and Enhancement Area (SPEA) or immediately adjacent to it, and removal of any hazard trees shall be overseen by the Qualified Environmental Professional (QEP). A certified arborist should erect fencing to protect tree roots during construction. The QEP recommends a permanent fence be erected 2m from the top of the bank, or along the SPEA, to ensure no disturbance occurs. Stormwater runoff should not be directed onto the slope and measures are to be implemented during construction to ensure no deleterious material enters the stream. Environmental monitoring during construction is a requirement of the RAR and a post-development report

is to be submitted by the QEP to the Ministry of Environment and CRD after the work has been completed.

Local governments can establish floodplain regulations pursuant to Section 910 of the *Local Government Act*. Part 5 of The Sooke Land Use Bylaw No. 2040 requires a 15m setback and 1.5m building elevation from watercourses; however, an exemption may be granted if a report is received from a geotechnical engineer confirming the land may be used safely for the use intended. A report was submitted by Brimmell Engineering on July 12, 2011 (Appendix 4).

The geotechnical report includes a slope profile showing the approximate location of the proposed house in relation to the ravine. The ravine slope is steep with a vertical scarp at the crest and a relatively level floodplain area between the base of the slope and the creek channel. Soil conditions consist of an organic layer overlying weathered till atop compact dense gravel till. Recommendations for foundation construction are provided including the use of 'finwalls' supporting a grade beam. Further, the main floor of the dwelling should be constructed over a crawlspace rather than a slab-on-grade to protect against impacts should a minor slide occur. The proposed septic field area is not expected to pose any slope stability issues. The engineer confirms the land may be used safely for the intended use of residential construction.

There is no building site available on the property outside of the 30m riparian setback from Goudie Creek. The applicant has proposed an 84m^2 building envelope along the westerly boundary of the lot with a driveway/parking area and engineered septic field. The professional reports submitted by the QEP and geotechnical engineer support construction of a small residence in this location provided the recommendations outlined in their reports are followed. The applicant is therefore requesting a variance to relax the side yard setback of the RR2 zone from 6m to 1.5m and to relax the front yard setback from 7.5m to 6m for the purpose of constructing an 84m^2 single-family dwelling. The proposed location of the building could potentially present future side yard encroachment issues and pose a visual impact from Denewood Place; however, although the site is very limited by Goudie Creek, construction is feasible in the proposed location as outlined in the professional reports submitted in support of this application. Therefore, staff recommends approval of the development permit with variance and floodplain exemption subject to public notification and subject to the recommendations outlined in Appendices 3 and 4.

LEGISLATIVE IMPLICATIONS

The Sooke Land Use Bylaw No. 2040 specifies yard requirements for the Rural Residential 2 zone. To vary these requirements, a development variance permit is required.

The Sooke Land Use Bylaw (Bylaw No. 2040) contains requirements for floodplain setbacks. To vary the floodplain setback relaxation a floodplain exemption as per Section 910 (5) of the *Local Government Act* is required. The information submitted with this application is considered in substantial compliance with these guidelines.

The Shirley/Jordan River Official Community Plan (Bylaw No. 3352) outlines development permit guidelines. The property is within the Watercourses, Wetlands, and Riparian Areas Development Permit Areas; therefore, a development permit is required.

PUBLIC CONSULTATION IMPLICATIONS

Pursuant to the *Local Government Act,* Section 922(4), if a local government is proposing to pass a resolution to issue a development variance permit it must give notice to each resident/tenant within a given distance as specified by bylaw. Capital Regional District Bylaw No. 3110, Fees and Procedures Bylaw, states that the Board at any time may refer an application to an agency or organization for their comment. In addition, it states that a notice of intent must be mailed to adjacent property owners within a distance of not more than 500 metres. Any responses received from the public will be presented at the August 16, 2011 Land Use Committee meeting.

CONCLUSION

The applicant is requesting a development permit with variance and floodplain exemption for the purpose of constructing an 84m^2 single-family dwelling adjacent to Goudie Creek. The lot was established by subdivision in 1972 and has a very limited building area. Professional reports have been submitted in support of the application outlining recommendations for construction. The applicant has requested a variance to relax the front yard setback from 7.5m to 6m for the purpose of constructing a dwelling. Staff

recommend approval of the development permit with variance and floodplain exemption subject to public notification and subject to the recommendations outlined in the professional reports.

RECOMMENDATION

That the Land Use Committee recommends to the Capital Regional District Board:

1. That the watercourses, wetlands and riparian areas development permit (DP-18-11) for Lot 113, Section 95, Renfrew District, Plan VIP26054 and the request for:
    a. Relaxation of the front yard setback from 7.5m to 6m for the proposed dwelling;
    b. Relaxation of the side yard setback from 6m to 1.5m for the proposed dwelling; and
    c. Exemption from floodplain setback regulations of Part 5 of Bylaw No. 2040,

    as shown in Appendix 2, be approved subject to the following conditions:
    i. that the proposed construction comply with the Watercourses, Wetlands and Riparian Areas Development Permit Guidelines outlined in the Shirley/Jordan River Official Community Plan, Bylaw No. 3352;
    ii. that the geotechnical report prepared by Brimmell Geotechnical dated July 12, 2011, as shown in Appendix 4, be secured by restrictive covenant as part of the building permit process;
    iii. that the recommendations outlined in the environmental report prepared by Swell Environmental Consulting Ltd. dated November 15, 2010, as shown in Appendix 3, be set as conditions of the development permit; and
    iv. that the conditions of this development permit be verified as part of the building permit process.

Emma Taylor, MA
Planner

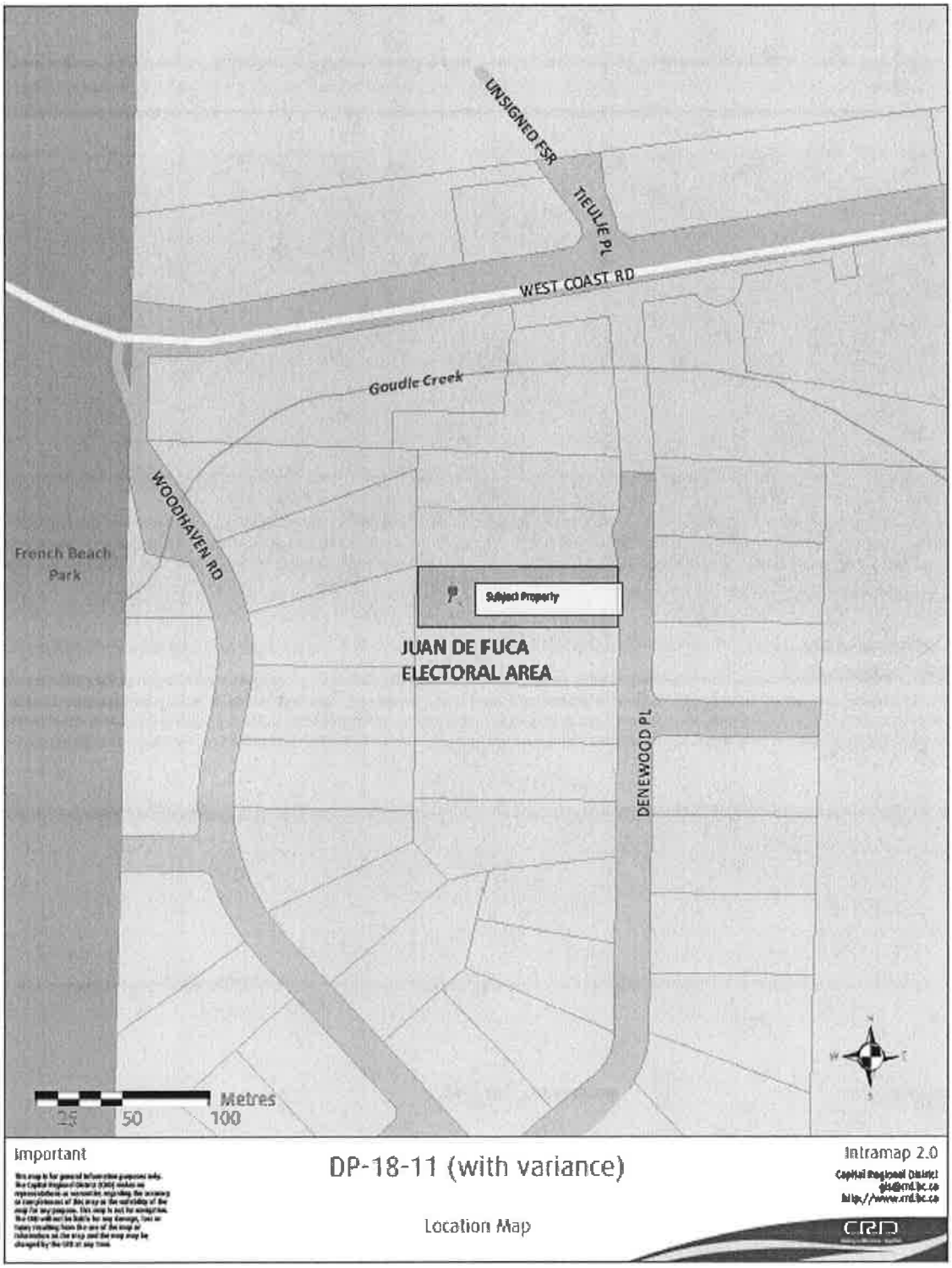
June Klassen, MCIP
Manager, Local Area Planning

Robert Lapham, MCIP
General Manager, Planning & Protective Services

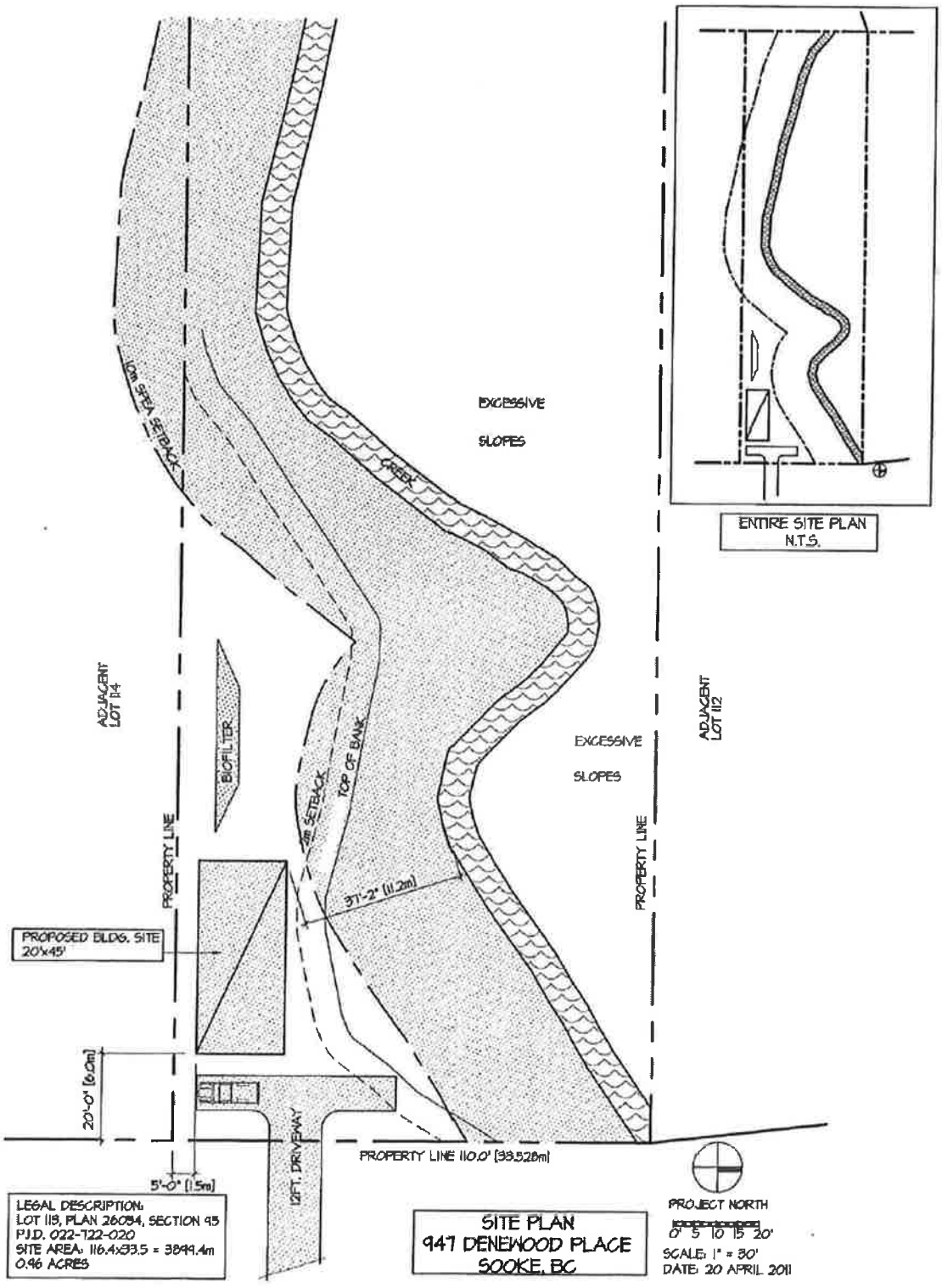
Kelly Daniels
Chief Administrative Officer
Concurrence

Appendix 1: Location Map
Appendix 2: Site Plan
Appendix 3: Environmental Report
Appendix 4: Geotechnical Report

Appendix 1: Location



Appendix 2: Site Plan



Riparian Area Regulation Assessment Report
947 Denewood Place, Sheringham Estates

Prepared For:

Eric Pattison
202-204 6th Street
New Westminster, BC V3L 3A1

Prepared By:

Swell Environmental Consulting Ltd.
3345 University Woods, Victoria, BC V8 5R2

Updated November 15, 2010

Table of Contents

Riparian Areas Regulation: Assessment Report

Please refer to submission instructions and assessment report guidelines when completing this report.

Date: Nov 15, 2010

I. Primary QEP Information

First Name	Lehna	Middle Name	Kathleen	
Last Name	Malmkvist			
Designation	RPBio	Company	Swell Environmental Consulting Ltd.	
Registration #	1613	Email	lehna@swell.ca	
Address	3345 University Woods, Victorai, BC			
City	Victoria	Postal/Zip	V8P 5R2	Phone # 250-217-9190
Prov/state	BC	Country	Canada	

II. Secondary QEP Information (use Form 2 for other QEPs)

First Name	Richard	Middle Name	Chester	
Last Name	Brimmell			
Designation	PEng	Company	R. Brimmell Engineering	
Registration #	12949	Email	rbrimmell@pacificcoast.net	
Address	971 Bank Street			
City	Victoria	Postal/Zip	V8S 4B1	Phone # 250-592-7645
Prov/state	BC	Country	Canada	

III. Developer Information

First Name	Eric	Middle Name	
Last Name	Pattison		
Company	Eric Pattison Architect		
Phone #	604 525 3232	Email	eric@eparchitect.ca
Address	#202-204 6th Street		
City	New Westminster	Postal/Zip	V3L 3A1
Prov/state	BC	Country	Canada

IV. Development Information

Development Type	Construction: Single-Family Residential		
Area of Development (ha)	0.03	Riparian Length (m)	150
Lot Area (ha)	0.39	Nature of Development	New
Proposed Start Date	January 15, 2011	Proposed End Date	December 31, 2011

V. Location of Proposed Development

Street Address (or nearest town)	947 Denewood Place						
Local Government	Capital Regional District			City	Sooke		
Stream Name	Goudie Creek						
Legal Description (PID)	Lot 113, Plan 26054, Section 95, Renfrew District			Region	1 – Vancouver Island		
Stream/River Type	Stream			DFO Area	Area 18, Van. Is.		
Watershed Code	930-033000						
Latitude	48	23	34	Longitude	123	56	8

Completion of Database Information includes the Form 2 for the Additional QEPs, if needed. Insert that form immediately after this page.

Make duplicates of the complete form fields and paste below each other for additional QEPs

II. Additional QEP Information

First Name	Donald		Middle Name	
Last Name	Skinner			
Designation	RPBio		Company Gye & Associates Ltd.	
Registration #	827	Email don@concretejungleforestry.ca		
Address	5965 Wallace Drive			
City	Victoria	Postal V9E 2G7	Phone # 250-544-1700	
Prov/state	BC	Country Canada		

1. Description of Fisheries Resources Values and a Description of the Development Proposal

The stream on the proposed development property is named Goudie Creek (watershed code 930-033000). This stream flows roughly east to west, and empties into Juan de Fuca Strait at French Beach Provincial Park (Figure 1.1). According to the B.C. Ministry of Sustainable Resource Management Fisheries Inventory Data Queries system, the stream contains cutthroat trout (*Oncorhynchus clarkii*) in at least some parts of the system. No barriers to fish were identified in the field assessment of the property. However, no assessments for fish presence were conducted on the property, and the condition of the stream was not assessed beyond the property boundaries. The stream is therefore assumed to be fish-bearing for the purposes of this RAR report. The stream on the property consists of one hydrological reach only. It extends from a culvert under Denewood Pl., downstream to the western property boundary, approximately 150 m.

The riparian vegetation on the property is healthy and vigorous. It consists of mature second-growth mixed conifer/deciduous forest located in the Coastal Western Hemlock biogeoclimatic zone (Pojar *et al.*, 1991). Species present include western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesii*), red alder (*Alnus rubra*), bigleaf maple (*Acer macrophyllum*), salmonberry (*Rubus spectabilis*), salal (*Gaultheria shallon*), red huckleberry (*Vaccinium parvifolium*), bracken fern (*Pteridium aquilinum*) and deer fern (*Blechnum spicant*). Large western redcedar stumps in excess of 1.5 m diameter indicate logging ca. 60-80 years ago.

The stream channel is also in good condition with no evidence of excessive erosion, deposition, trampling or other disturbance. Abundant large wood in the stream channel is present to dissipate the energy of high flows and to maintain floodplains and habitat (see Section 6, Photographs). According to the principles outlined by Prichard (1998), the stream is in a state of Proper Functioning Condition (note that a full assessment requires an interdisciplinary team, however in this case two field biologists only employed the method). The characteristics under the categories of hydrology, vegetation and soils were present in the condition required to maintain proper function, and the stream was observed to be in balance with the landscape setting.

The proposed development consists of a three bedroom mobile home and carport, to be located along the southern edge of the property boundary, on an elevated terrace above the stream and floodplain. Specific activities proposed include construction of the building foundation and installation of a septic drainfield.

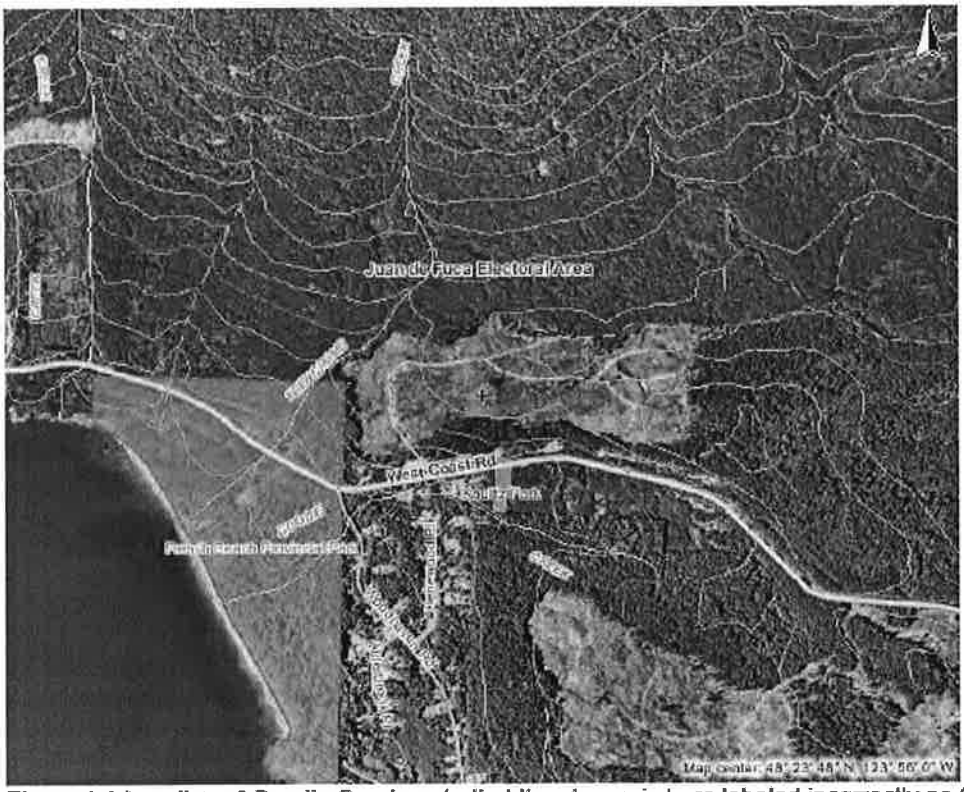


Figure 1.1 Location of Goudie Creek; note that the stream is here labeled incorrectly as Guode Creek, and that the location is also inaccurately drawn some distance to the north of its actual course; the red X marks the approximate location of the proponent's property.

2. Results of Detailed Riparian Assessment

The site was revisited on October 27, 2010 and the measurements and vegetation descriptions are still applicable to the site.

Refer to Chapter 3 of Assessment Methodology

Date: 06-11-23

Description of Water bodies involved (number, type): One Stream (one reach)

Stream	X
Wetland	
Lake	
Ditch	
Number of reaches	1
Reach #	1

Channel width and slope and Channel Type (use only if water body is a stream or a ditch, and only provide widths if a ditch)

	Channel Width(m)*	Gradient (%)
starting point	3.20	
upstream	2.35	
	2.87	4.5
	2.34	
	3.47	
	3.23	
downstream	3.15	
	2.30	
	3.40	4.5
	2.90	
	3.10	
Total: minus high flow	26.5	
mean	2.94	

	R/P	C/P	S/P
Channel Type		X	

I, Lehna Malmkvist, hereby certify that:

a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*;

b) I am qualified to carry out this part of the assessment of the development proposal made by the developer Eric Pattison);

c) I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and

d) In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation.

Site Potential Vegetation Type (SPVT)

	Yes	No	
SPVT Polygons		X	Tick yes only if multiple polygons, if No then fill in one set of SPVT data boxes

I, Lehna Malmkvist , hereby certify that:

a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*;

b) I am qualified to carry out this part of the assessment of the development proposal made by the developer Eric Pattison ;

c) I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and

d) In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation.

Polygon No:				Method employed if other than TR
	LC	SH	TR	
SPVT Type			X	

Polygon No:				Method employed if other than TR
	LC	SH	TR	
SPVT Type				

Polygon No:				Method employed if other than TR
SPVT Type				

Zone of Sensitivity (ZOS) and resultant SPEA

North Bank

Segment No:	1	If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons					
LWD, Bank and Channel Stability ZOS (m)	10						
Litter fall and insect drop ZOS (m)	10						
Shade ZOS (m) max	8.82	South bank	Yes		No	X	
Ditch	Justification description for classifying as a ditch (manmade, no significant headwaters or springs, seasonal flow)						
Ditch Fish Bearing	Yes		No		If non-fish bearing insert no fish bearing status report		
SPEA maximum	10	(For ditch use table3-7)					

South Bank

Segment No:	2	If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons					
LWD, Bank and Channel Stability ZOS (m)	10						
Litter fall and insect drop ZOS (m)	10						
Shade ZOS (m) max	8.82	South bank	Yes	X	No		
SPEA maximum	10	(For ditch use table3-7)					

Segment No:		If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons					
LWD, Bank and Channel Stability ZOS (m)							
Litter fall and insect drop ZOS (m)							
Shade ZOS (m) max		South bank	Yes		No		
SPEA maximum		(For ditch use table3-7)					

I, Lehna Malmkvist, hereby certify that:

a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*;

b) I am qualified to carry out this part of the assessment of the development proposal made by the developer Eric Pattison;

c) I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and

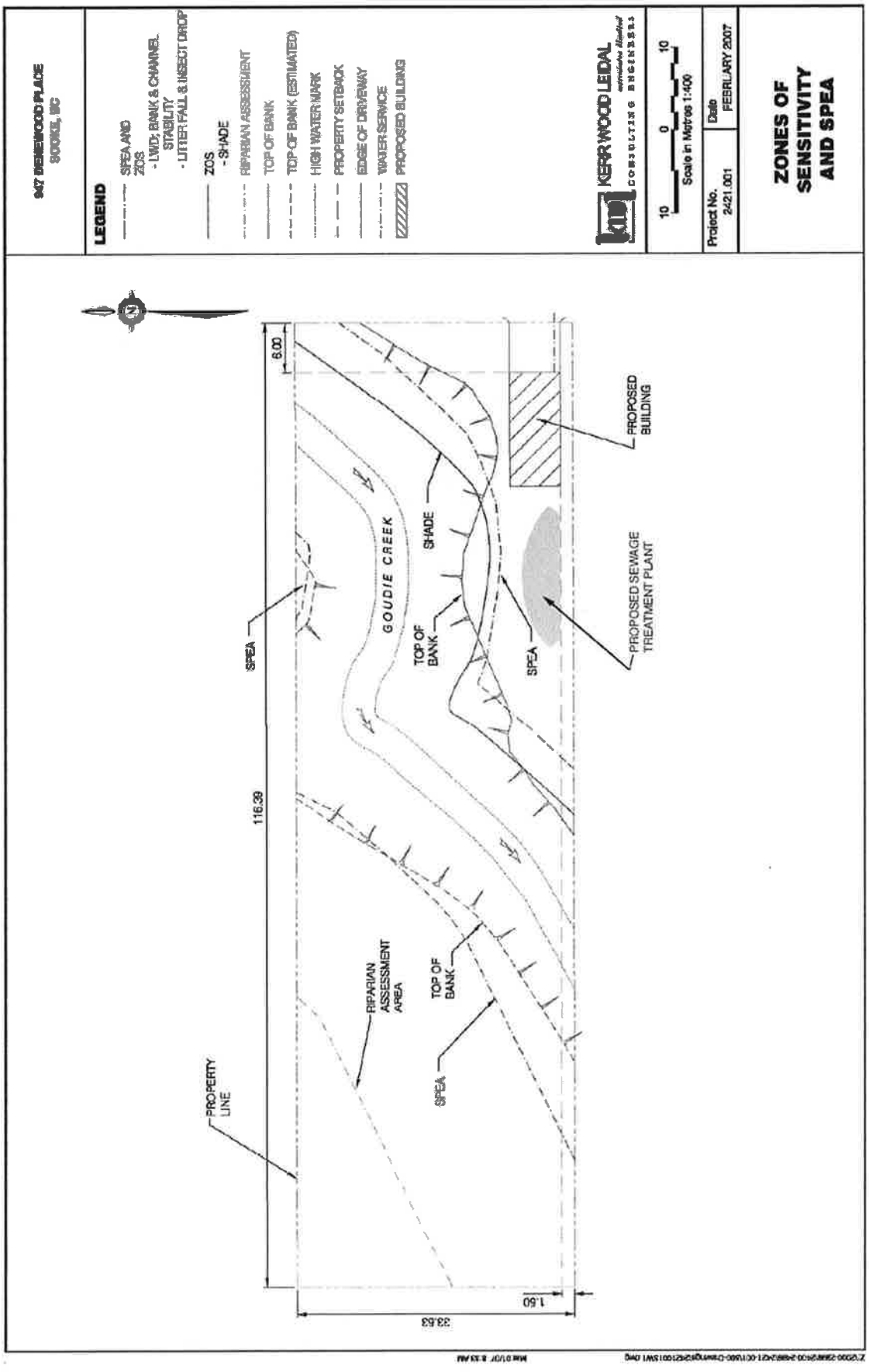
d) In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation.

Comments

* Note, highlighted stream channel widths indicate those which were discarded in order to calculate the average.

- Vegetation includes western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesii*), red alder (*Alnus rubra*), bigleaf maple (*Acer macrophyllum*), salmonberry (*Rubus spectabilis*), salal (*Gaultheria shallon*), red huckleberry (*Vaccinium parvifolium*), bracken fern (*Pteridium aquilinum*) and deer fern (*Blechnum spicant*);
- Abundant large wood in channel;
- No evidence of excessive erosion/deposition
- Healthy/vigorous riparian vegetation
- Properly Functioning stream channel

3. Site Plan


647 BEINEWOOD PLACE
SOOKE, BC
LEGEND
SPEA AND ZOS - LWD, BANK & CHANNEL STABILITY - LITTER FALL & INSECT DROP
ZOS - SHADE
RIPARIAN ASSESSMENT
TOP OF BANK
TOP OF BANK (ESTIMATED)
HIGH WATER MARK
PROPERTY SETBACK
EDGE OF DRIVEWAY
WATER SERVICE
PROPOSED BUILDING
KERR WOOD LEIDAL
10 0 10
Scale in Metres 1:400
Project No. 2421.001
Date FEBRUARY 2007
ZONES OF SENSITIVITY AND SPEA
PROPOSED BUILDING
PROPOSED SEWAGE TREATMENT PLANT
SHADE
GOUDIE CREEK
TOP OF BANK
SPEA
SPEA
6.00
116.39
PROPERTY LINE
RIPARIAN ASSESSMENT AREA
TOP OF BANK
SPEA
1.50
33.53

4. Measures to Protect and Maintain the SPEA

This section is required for detailed assessments. Attach text or document files, as need, for each element discussed in chapter 1.1.3 of Assessment Methodology. It is suggested that documents be converted to PDF *before* inserting into the assessment report. Use your "return" button on your keyboard after each line. You must address and sign off each measure. If a specific measure is not being recommended a justification must be provided.

1. Danger Trees	
I, Don Skinner, hereby certify that: e) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*; f) I am qualified to carry out this part of the assessment of the development proposal made by the Eric Pattison; g) I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation	
2. Windthrow	
I, Don Skinner, hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer Eric Pattison; c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation	
d. Slope Stability	
I, Richard Brimmell, hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer Eric Pattison; c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation	
e. Protection of Trees	
I, Don Skinner, hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer Eric Pattison; c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation	
d. Encroachment	
I, Lehna Malmkvist, hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer Eric Pattison; c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation	
e. Sediment and Erosion Control	
I, Lehna Malmkvist, hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer Eric Pattison; c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation	
d. Stormwater Management	
I, Lehna Malmkvist, hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer Eric Pattison; c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation	
e. Floodplain Concerns (highly mobile channel)	
I, Lehna Malmkvist, hereby certify that: f. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the *Fish Protection Act*; g. I am qualified to carry out this part of the assessment of the development proposal made by the developer Eric Pattison; h. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation	

4.1 Danger Trees

In October 2010 Jeremy Gye from Gye & Associates visited the site and provided and updated report, which is attached in Appendix 2, along with the original report by Don Skinner.

As summarized (or quoted where indicated) from Appendix 2, the tree assessment report by Don Skinner, Gye & Associates:

- There are numerous trees on the lot that are within striking distance of dwellings on adjacent properties.
- "Numerous structural defects were noted in standing trees throughout the property and root decay (*Heterobasidium sp.*) was observed in the root plates of three fallen hemlocks."
- Increasing force/frequency of storm-force winds, such as that experienced last winter, introduce some uncertainty in properly assessing windthrow, and "many otherwise sound trees have failed during this past winter's storms."
- "The historical evidence of tree failure on this property and nearby lands indicates that failures occur in both the over-story and mid-story of the forest. "
- The risk will not necessarily be abated by simply removing trees within striking distance of structures. Instead, a "stand-level" approach is recommended, based on the following principles:
    1. *Stand integrity will be maintained by removing as few trees as possible. The only candidates for removal should be trees with significant structural defects, which can't be mitigated by any other means. Even in these cases, if they are windfirm, it should be possible to leave some as modified "wildlife trees" to provide habitat for cavity nesting birds and mammals, providing it is safe for the worker to climb these trees.*
    2. *Rely upon careful height reduction of trees with exposed crowns to reduce the leverage and exposure of these trees to wind. Particular attention should be paid to the trees along the northern edge of the stand.*
    3. *Aim to create a canopy ceiling that is relatively uniform in profile so as to remove impediments to wind sweeping over the top of the forest canopy.*
    4. *Encourage the owner of the adjacent land to the north of Lot 113 to re-populate the forest edge on his property with new conifers. As the new trees mature in size, the will create a wind-buffer and help to protect the interior of the stand. The north edge is the only side of the stand amenable to replanting: the stand is continuous to the south and west (apart from area occupied by driveways, houses and outbuildings on these properties) and is bounded by a road to the east.*

a. "If this approach is followed, the risk of windthrow will be reduced as much as may be practicable, tree loss within the S.P.E.A. will be minimized and stand dynamics, *vis-à-vis* windloading will be improved."

In summary, the developer will not remove any trees that are within or immediately adjacent to the SPEA, nor on or at the crest of the steep slope (where portions of the slope are outside the SPEA), unless individual trees present an unacceptable risk of property damage and all other means to mitigate that risk (e.g. by limbing/topping) are not feasible. In the event that danger trees in these areas require removal, the work will be overseen by the QEP(s) so as to minimize any associated disturbance, and the QEP(s) will in turn notify the Ministry of Environment and the municipality (if required) in advance of the removal operation.

4.2 Windthrow

As mentioned above, careful attention to trees along the steep slope is required; this issue is also related to windthrow, since clearing conducted farther back from the slope may also expose trees along the slope to damage from wind. In order to ensure the wind-firmness of trees within and adjacent to the SPEA, the advice included in Section 4.1 applies also to protection of trees from windthrow. Please See Appendix 2 for additional details.

4.3 Slope Stability

In October 2010, Richard Brimmell re-visited the site and provided and updated report, which is attached in Appendix 3, along with the original report.

The property includes an elevated terrace bordered by a steep slope that descends to the stream (approximately 10-15 m in elevation). The advice of a geotechnical engineer has been obtained (Appendix 2). The slope appears to be stable at present, with no evidence of active erosion or other indicators of instability. However, the top of the slope includes a vertical scarp at the crest, and is held in place by vegetation including tree roots. The SPEA extends past the top of the slope in some areas, but not all. It is imperative to protect this slope from damage, in order to ensure protection of the SPEA and the stream itself. In addition to prudent site planning (i.e. locating the building a suitable distance from the top of the bank), the required means of protection is a permanent fence along the top of bank (and/or at the edge of the SPEA). This will prevent people or animals from walking on the slope and creating disturbed areas that could drain water and lead to erosion. This fence shall be located no closer than 2 m from the edge of the break in slope, and farther where the SPEA dictates. Furthermore, trees along the top of the bank must be retained, and their root zones protected from compaction from paved surfaces or building footprints. Some permeable surfaces, such as gravel or permeable pavers, could be suitable if they are located an appropriate distance from the edge of the slope, with the approval of a geotechnical engineer. Stormwater runoff from building roofs and paved areas must not be directed onto the slope, and the septic field must be located well back from the top of the bank.

The geotechnical report (Appendix 3) states that the currently proposed building location will not cause slope instability (that could lead to damage to the SPEA), provided the foundation is constructed as outlined in the report, with four or five "finwalls," and the building footprint does not encroach into the SPEA (not permitted under the RAR); these recommendations apply only to the proposed location of the structure shown in the site plan, and do not assure slope stability if this plan is altered. Note furthermore that other structures, including gardens, patio, deck, driveway, etc. may not be located within the SPEA and must not overhang, or be situated immediately adjacent to, the steep slope.

4.4 Protection of Trees

As discussed above, the trees located near the top of the steep slope require protection in order to protect the slope and the SPEA from damage. Careful site planning must be undertaken so as to locate building envelopes and paved surfaces outside the root zones of large trees near the edge of the SPEA and/or the edge of the steep slope. The advice of a certified arborist is required in order to outline the "no go zone" required to protect specific trees that are of particular importance to slope stability. Construction activities, including removal of topsoil and compaction, must be conducted outside of these zones, which are to be clearly marked with highly visible fencing. The means of protecting these trees will be clearly communicated to

construction supervisors and crews at the start of the project, documented, and carried through until completion. In addition,

- Tree removal, modification and clean-up must be undertaken under the oversight of the Qualified Environmental Professional (Gye and Associates Ltd) for Tree Management. Trees must only be removed/modified in a manner that protects the surrounding vegetation, soils and slope stability from undue impacts.
- Gye and Associates will work with Swell Environmental Consulting in determining whether and how much of the trees designated for removal or modification should be directed into the SPEA as a source of coarse organic debris.
- Once the clean-up of tree debris has been completed and before any further site works are begun, robust tree protection fencing will be erected along the edge of the protected trees, adjacent the SPEA. A fencing detail is provided in Appendix 2. The protective fencing alignment is to be determined on site, at the time of placement, by the QEP.
- During the site preparation and construction phases, the site must be monitored weekly by the QEP or designate to ensure ongoing compliance with the tree protection measures.

4.5 Encroachment

Encroachment refers to activities that result in damage to the SPEA, such as trampling, removal of vegetation, dumping of yard waste, landscaping, etc. These activities can result in further degradation such as erosion of the stream banks and channel, and sediment washed downstream which can then harm fish and fish habitat. Damage to vegetation (trees, shrubs, herbaceous species) can reduce the shade, nutrients, biodiversity and channel stabilization that it provides for proper eco-hydrological function. In larger developments, extensive programs, including fencing, signage and educational initiatives are often required to prevent encroachment. Given that the proposed development involves only one property owner and one dwelling, the following measures are deemed to be appropriate:

- The developer has been informed of the importance of the SPEA and agrees to prevent encroachment and to not engage in any of the prohibited activities therein.
- The edge of the SPEA will be clearly marked with a variety of fencing types, as described below.
- In low-angle slope areas that are not subject to high traffic, a split rail fence will suffice to delineate the edge of the SPEA. This is more of a visible barrier than a physical barrier, meant to remind people of where the SPEA is located, and the need to stay out.
- In areas near the steep slope and where human/pet traffic may be higher, the fence shall be more robust, for example: 4 to 6 feet tall, and made of wood (wooden slats), wire (e.g. page wire) with wood or metal posts, or chain-link. These types of fences can also act as a safety measure to protect people from falling down the steep slope, particularly near the proposed house site.
- Any tenants will be duly informed of, and agree to, these requirements, for example with a clause in the rental agreement and accompanying explanations.

4.6 Sediment and Erosion Control

The developer is responsible for designing an effective erosion and sediment control plan that ensures no sediment laden water enters the SPEA nor the stream on the property, and that erosion of nearby slopes does not occur such that the SPEA is damaged. The RAR also

prohibits treatment, including filtration, of stormwater within the SPEA. The QEP can provide general recommendations as to the design principles of the plan, and can monitor its effectiveness.

The federal Fisheries Act (1985) prohibits the deposit of a deleterious substance (including sediment) in water frequented by fish. Furthermore, any stormwater discharges into adjacent downstream receiving environments (especially freshwater ecosystems) should meet the federal (Canadian Council of Ministers of the Environment) and provincial (B.C. Ministry of Environment) water quality guidelines for the protection of aquatic life. In order to comply with the Act and guidelines, it is essential that any Erosion and Sediment Control Plan be designed to an adequate standard. The document entitled *Storm water management for industrial activities: developing pollution prevention plans and best management practices*, by the US EPA (1992), is recommended as a guide with high standards for preventing erosion and sedimentation.

The principal requirement of the EPA method is the development of a Stormwater Pollution Prevention Plan (SPPP or PPP), which must be implemented prior to commencement of any on-site construction activity. Water quality sampling should be conducted periodically, according to the procedure outlined by the EPA (1992), to ensure the effectiveness of erosion and sediment control measures (e.g. infiltration galleries, sedimentation ponds, enclosure fencing, design criteria, erosion control mats, planting programs, etc.). Weekly inspections, combined with photopoint monitoring, are also recommended as a means to monitor and document the effectiveness of the erosion and sediment control plan. See Section 5 of this report for a more detailed description about environmental monitoring procedures recommended for this project.

Given the small scale of the proposed development, measures such as minimizing site clearing, installation of silt fence adjacent to the SPEA and clearing and construction during dry weather, should provide adequate erosion and sediment control to protect the SPEA and water course.

4.7 Stormwater Management

Stormwater should be managed in such a way as to mimic the natural hydrology of the site to the extent possible. The main challenge in this regard is to allow rainwater to infiltrate the ground, rather than running off impervious surfaces; this allows greater purification of the water, and reduces the potential for erosion from high flows. Some possible means to accomplish infiltration include bioswales and rain gardens to capture and infiltrate roof runoff, and permeable surfacing such as gravel, grass-pave or paving blocks. In particular, stormwater must not be drained via pipes or drain tiles onto the steep slope adjacent to the stream, or directly into the SPEA.

In addition to stormwater management, sewage treatment will also occur on site. The treatment plant and effluent are outside the SPEA and not expected to cause any degradation to the SPEA or watercourse. See Kerr Wood Leidal Report in Appendix 4 for details.

4.8 Floodplain Concerns

Floodplains are not a concern on this property, as the stream has narrow floodplains that are contained within the SPEA.

5. Environmental Monitoring

Monitoring of construction activities is required under the RAR to ensure the SPEA is protected and that the Erosion and Sediment Control Plan is carried out in an effective manner. Weekly inspections (by the QEP or a designate) are required at a minimum, in addition to more frequent inspections during times of high rainfall. Items to be checked on these inspections include:

- Preventative erosion and sediment control measures are in place (e.g. timing and phasing of construction so as to minimize disturbed area);
- Locations of no-go zones and sensitive areas are marked and communicated to all personnel;
- Spill response kits are on site when any heavy machinery is working, and operators have been trained to use them;
- Erosion/sediment control measures (e.g. infiltration trenches, sediment filtration dams, etc.) are in place and functioning well;
- Tracking of soil and sediment off the site (onto neighbouring roads) is not occurring.

Photopoint monitoring is the preferred means to document that proper construction and erosion/sediment control methods are carried out: specific locations are chosen and marked by the QEP prior to construction, and photographs are taken from the same locations (with the same views through the camera) periodically throughout the construction period. This documentation must be carried out by the QEP.

Post-Development Report

The QEP will file a post-development report on behalf of the developer, submitted through the Ministry of Environment Notification System, after the development has been completed. This report will document that the required measures and conditions outlined in this report have been implemented, as per Section 5(a) of the Riparian Area Regulation. A physical inspection of the site and the SPEA will be conducted, to ensure that no damage has occurred or is anticipated and the required management practices have been carried out. A checklist will be drafted, with each of the measures and monitoring requirements listed above, and accompanying documentation will be attached, such as a summary of the results of the monitoring and photographs.

6. Photographs

Figure 6.1 Upstream end of reach on proponent's property (culvert under Denewood Pl.)

Figure 6.2 Looking downstream from upper end of reach

Figure 6.3 Goudie Creek, near middle of reach, illustrating healthy riparian vegetation and functional channel, near midpoint of reach

Figure 6.4 Large wood near midpoint of reach, serving to slow flows and protect banks from erosion

7. Assessment Report Professional Opinion on the Development Proposal's Riparian Area

Date | November 15, 2010 |

1. I/We Lehna Malmkvist, Don Skinner and Richard Brimmell

Please list name(s) of qualified environmental professional(s) and their professional designation that are involved in assessment.)
hereby certify that:

a) I am/We are qualified environmental professional(s), as defined in the Riparian Areas Regulation made under the *Fish Protection Act*;
b) I am/We are qualified to carry out the assessment of the proposal made by the developer Eric Pattison, which proposal is described in section 3 of this Assessment Report (the "development proposal"),
c) I have/We have carried out an assessment of the development proposal and my/our assessment is set out in this Assessment Report; and
d) In carrying out my/our assessment of the development proposal, I have/We have followed the assessment methods set out in the Schedule to the Riparian Areas Regulation; AND

2. As qualified environmental professional(s), I/we hereby provide my/our professional opinion that:

a) ☐ if the development is implemented as proposed by the development proposal there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian assessment area in which the development is proposed, OR

(Note: include local government flex letter, DFO Letter of Advice, or description of how DFO local variance protocol is being addressed)

b) ☒ if the streamside protection and enhancement areas identified in this Assessment Report are protected from the development proposed by the development proposal and the measures identified in this Assessment Report as necessary to protect the integrity of those areas from the effects of the development are implemented by the developer, there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian assessment area in which the development is proposed.

[NOTE: "qualified environmental professional" means an applied scientist or technologist, acting alone or together with another qualified environmental professional, if
(a) the individual is registered and in good standing in British Columbia with an appropriate professional organization constituted under an Act, acting under that association's code of ethics and subject to disciplinary action by that association,
(b) the individual's area of expertise is recognized in the assessment methods as one that is acceptable for the purpose of providing all or part of an assessment report in respect of that development proposal, and
(c) the individual is acting within that individual's area of expertise.]

References

B.C. Ministry of Sustainable Resource Management, Fisheries Inventory Data Queries. Online database, retrieved Nov. 26, 2006: http://srmapps.gov.bc.ca/apps/fidq/

Pojar, J., Klinka, K. and D.A. Demarchi. 1991. Chapter 6: Coastal Western Hemlock Zone. Special Report Series 6: Ecosystems of British Columbia, Feb. 1991. B.C. Ministry of Forests. Retrieved Nov. 27, 2006: http://www.for.gov.bc.ca/hfd/pubs/docs/Srs/Srs06/chap6.pdf

Prichard, D. (work group leader). 1998. Riparian Area Management; a User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. U.S. Department of the Interior, Bureau of Land Management, National Applied Resource Sciences Center. Technical Reference 1737-15.

United States Environmental Protection Agency (EPA). 1992. Storm water management for industrial activities: developing pollution prevention plans and best management practices. EPA-833-R-92-005.

Appendix 1. FISS Data Report

Obtained from B.C. Ministry of Sustainable Resource Management (Fisheries Inventory Data Queries) website, Nov. 26, 2006

FISS Report

Gazetted Name : GOUDIE CREEK
Watershed Code : 930-033000
Waterbody Identifier : 00000SANJ
Region : 1
Alias :
Type : S
Report created on : Sun Nov 26 22:27:15 PST 2006

Water Quality Stations

No records found

Water Survey Stations

No records found

Management Objectives

No records found

Enhancement

Activity	Start Year	Finish Year	Species Name	Comments	Reference Number	Geo Ref 1	Geo Ref 2
213 Fish Sampling	1996	1996	Cutthroat Trout	STREAM CLASSIFICATION SURVEY	HQ0336	W 315863	

Harvests and Uses

No records found

Resource Use

No records found

Resource Values

No records found

Resource Sensitivities

No records found

Land Use

No records found

Fisheries Potentials and Constraints

No records found

Obstructions

No records found

Escapements

No records found

Fish Distributions

Species Name	Stock / Stock Type	Stock Char	Management Class	Activity	Comments	Refs And Dates	Geo Ref 1	Geo Ref 2
Cutthroat Trout	/ NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone	NOTED ON MAP.	(FISSM01, 01-JAN-1995) 	P 092B05 577	
Cutthroat Trout	/ NOT SPECIF	Not Specif	Not Specified	OBL Fish observed at this point or zone		(HQ0336, 01-SEP-1996) 	W 315863	

Species and Life Phase History

No records found

Fiss References

Search AquaCat for keywords: GOUDIE CREEK

Reference Number :	FISSM01
Title :	**FISS map/form information (source not indicated)**
Description :	map information
Location :	MELP - Fisheries Headquarters, Victoria
Reference code :	Map
Year :	1995
Author :	DEPARTMENT OF FISHERIES AND OCEANS (DFO)

Reference Number :	FISSM01
Title :	**FISS map/form information (source not indicated)**
Description :	map information
Location :	MELP - Fisheries Headquarters, Victoria
Reference code :	Map
Year :	1995
Author :	MELP

Reference Number :	HQ0336
Title :	**STREAM CLASSIFICATION - ROUGH CREEK**
Description :	PREPARED FOR: WESTER FOREST PRODUCTS
Location :	HEADQUARTERS VICTORIA, B.C.
Reference code :	Consultant Report
Year :	1996
Author :	REUSSE, ANNE

3 references were found.

Appendix 2. Tree Assessment Report

Obtained from Don Skinner, RPBio

Gye and Associates Ltd.

Consultants in Urban Forestry and Arboriculture

June 26, 2007

Swell Consulting
lehna@swell.ca

Attention: Lehna Malmkvist

Re: Lot 113, Denewood Place, Sheringham Estates, Sooke, BC
Riparian Area Regulation
Danger Tree, Windthrow and Tree Protection Assessment

Dear Ms. Malmkvist:

Please find enclosed our tree assessment report, which has been undertaken in fulfillment of Section 4 requirements of the Riparian Area Assessment on behalf of Swell Consultants. The purpose of this assessment is to identify requirements for tree protection within the Streamside Protection and Enhancement Area, as well as danger tree or windfall potential abatement requirements within the S.P.E.A. (and Special Measures Zone, if required).

Site assessment work was conducted first on February 15, 2007 and further on May 15, 2007. The subject lot is a forested .4 hectares site. A year-round creek, bounded by a ravine, transits the site from east to west. The lot adjacent to the north has been largely cleared of trees and contains a single family residence and out-buildings. The lots adjacent to the south and west are well-treed, single family residences with outbuildings. I have been provided a copy of a topographic site plan that identifies the top-of-bank and SPEA boundary, as well as a proposed house site and bio-filtration service area, which are located at the south-east corner of the site.

The tree resource on the subject lot consists of mature forest-grown conifers (largely Western Hemlock and Douglas fir) which make up the "over-story" of the forest canopy, with a middle strata (or "mid-story") of younger Western Red Cedar, hemlock, Red Alder and a minority of Big-leaf Maple. The conifers that dominate the top of the forest canopy tend to be drawn-up in form, with most of their foliage in the upper third of the tree.

Windthrow and Danger Tree Assessment

There is evidence of recent tree failures on the subject lot, most of which have failed into or alongside the creek bed. One large dominant hemlock, however, fell and struck the house on the adjacent lot to the north. The dwellings on the properties to the south, west and north of the subject lot all lie within striking distance of trees growing on the subject property. Numerous structural defects were noted in standing trees throughout the property and root decay (*Heterobasidium sp.*) was observed in the root plates of three fallen hemlocks.

The broader local area (west Sooke) has recently been the subject of unusually strong storm-force winds during the months of December 2006 and January 2007, resulting in extensive wind-throw of forest-grown conifers. The increasing force and frequency of storm-force winds along the south-west coast of Vancouver Island make it difficult to accurately assess which trees are vulnerable to windthrow. In this area many otherwise sound trees have failed during this past winter's storms.

The area to the north of the site slopes up to an elevation several hundred feet above sea level and has recently been logged. Winds from the north sweep over this high ground and down across the valley in which Sheringham Estates is situated. There is also evidence of tree failure within the subject property resulting from winds from both the west-south-west and south-east. The historical evidence of tree failure on this property and nearby lands indicates that failures occur in both the over-story and mid-story of the forest.

The above factors provide the broader context within which the question of danger trees within and adjacent to the riparian assessment area must be considered and evaluated.

Simply eliminating trees within striking distance of the adjacent dwellings, road and powerlines is not recommended. This will open up the interior of the residual forest canopy to rolling gusts and further exacerbate the problem of windthrow. We recommend instead a stand-level approach to wind-throw mitigation, based upon the following principles.

1. Stand integrity will be maintained by removing as few trees as possible. The only candidates for removal should be trees with significant structural defects, which can't be mitigated by any other means. Even in these cases, if they are windfirm, it should be possible to leave some as modified "wildlife trees" to provide habitat for cavity nesting birds and mammals, providing it is safe for the worker to climb these trees.
2. Rely upon careful height reduction of trees with exposed crowns to reduce the leverage and exposure of these trees to wind. Particular attention should be paid to the trees along the northern edge of the stand.
3. Aim to create a canopy ceiling that is relatively uniform in profile so as to remove impediments to wind sweeping over the top of the forest canopy.
4. Encourage the owner of the adjacent land to the north of Lot 113 to re-populate the forest edge on his property with new conifers. As the new trees mature in size, the will create a wind-buffer and help to protect the interior of the stand. The north edge is the only side of the stand amenable to replanting: the stand is continuous to the south and west (apart from area occupied by driveways, houses and outbuildings on these properties) and is bounded by a road to the east.

When this approach is followed, the risk of windthrow will be reduced as much as may be practicable, tree loss within the S.P.E.A. will be minimized and stand dynamics, *vis-à-vis* windloading will be improved. Tree-by-tree descriptions and prescriptions are provided in the attached tables. 44 trees have been identified, tagged and assessed on the property south of the creek, 19 of which are considered to be within or immediately adjacent the SPEA boundary. An additional 18 trees have been identified tagged and

assessed north of the creek, all of which are considered to be within or immediately adjacent the SPEA boundary.

Tree Protection:

- Tree removal, modification and clean-up must be undertaken under the oversight of the Qualified Professional (Gye and Associates Ltd) for Tree Management. Trees shall be removed / modified in a manner that protects the surrounding vegetation, soils and slope stability from undue impacts.
- Gye and Associates will work with Swell Consultants in determining whether and how much of the trees designated for removal or modification should be directed into the SPEA as a source of coarse organic debris.
- Once the clean-up of tree debris has been completed and before any further site works are begun, robust tree protection fencing will be erected along the edge of the protected trees, adjacent the SPEA. A fencing detail is provided as **Appendix—2**. The protective fencing alignment is to be determined on site, at the time of placement, by the Q.P.
- During the site preparation and construction phases, the site will be monitored weekly by the Q.P. to ensure ongoing compliance with the tree protection measures.

Certification:

This report and the opinions expressed within it have been prepared in good faith and to accepted arboricultural standards within the scope afforded by its terms of reference and the resources made available to the consultant.

For Gye and Associates Ltd.: Dated: May 29th, 2007
Don Skinner – Registered Professional Biologist (827)
I.S.A. Certified Arborist
I.S.A. Certification # 5907A

ASSUMPTIONS AND LIMITING CONDITIONS

1. This report and the opinions expressed within it have been prepared in good faith and to accepted arboricultural standards within the scope afforded by its terms of reference and the resources made available to the consultant. The report provides no undertakings regarding the future condition or behavior of the trees reviewed within it. Tree hazard and condition assessments are not an exact science. Both qualities can and do change over time and should be reappraised periodically.

2. The evaluation period for this assessment is 12 months.

3. Any legal description provided to the consultant/appraiser is assumed to be correct. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.

4. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other governmental regulations.

5. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant/appraiser can neither guarantee nor be responsible for the information provided by others.

6. The consultant/appraiser shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.

7. Loss or alteration of any part of this report invalidates the entire report.

8. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior expressed written or verbal consent of the consultant/appraiser.

Neither all nor any part of the contents of this report, nor copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales or other media, without the prior expressed written or verbal consent of the consultant/appraiser—particularly as to value conclusions, identity of the consultant/appraiser, or any reference to any professional society or institute or to any initialed designation conferred upon the consultant/appraiser as stated in his qualifications.

APPENDIX—1
SOUTH-BANK TREES

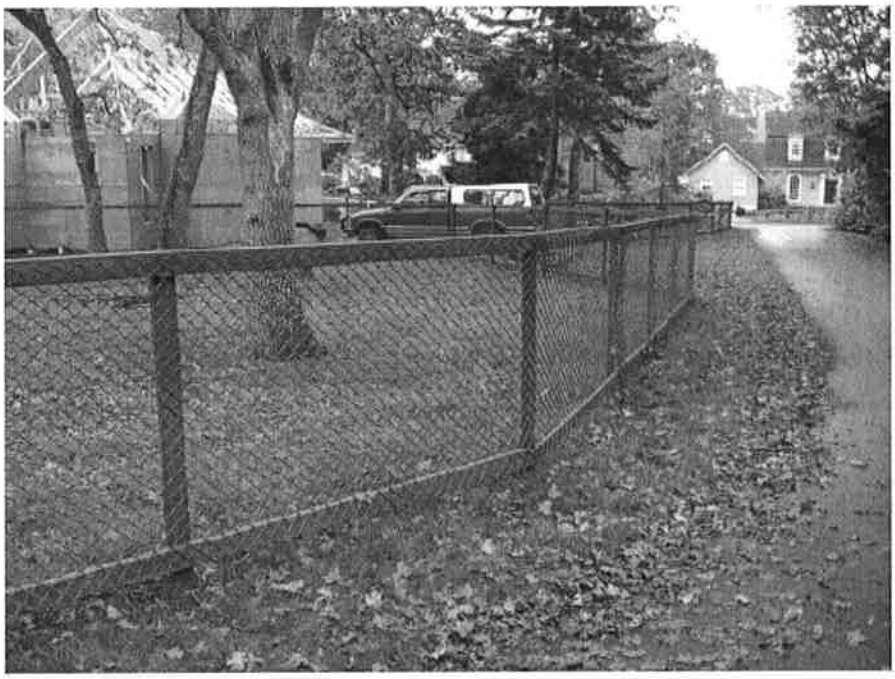
Tree #	Common Name	DBH	Location	Recommended Action
25 TREES OUTSIDE SPEA				
1	2 X Red Alder	.3, .35	Inside building footprint	Remove for house
5	Red Alder	0.2	Inside building footprint	Remove for house
6	Western Hemlock	0.4	Inside building footprint	Danger tree - Remove
7	Western Hemlock	0.15	Inside building footprint	Remove for house
8	Red Alder	0.35	Inside building footprint	Remove for house
9	Western Red Cedar	0.15	Inside building footprint	Remove for house
10	Western Hemlock	0.4	Inside building footprint	Remove for house
11	Western Hemlock	0.3	Inside building footprint	Remove for house
12	Western Hemlock	0.3	Inside building footprint	Remove for house
3	Western Hemlock	0.3	Inside bio-filter station footprint	Remove
4	Western Hemlock	0.3	Inside bio-filter station footprint	Remove
31	Western Hemlock	0.15	West of house site (outside SPEA)	Retain
32	2 X Red Alder	.40, .45	West of house site (outside SPEA)	Remove leaning south stem. Reduce remaining stem.
33	Western Hemlock	0.3	West of house site (outside SPEA)	Reduce
34	Red Alder	0.35	West of house site (outside SPEA)	Remove or convert to Wildlife Tree
35	Western Hemlock	0.3	West of house site (outside SPEA)	Retain
36	Red Alder	0.3	West of house site (outside SPEA)	Retain
37	Western Hemlock	0.25	West of house site (outside SPEA)	Retain
38	3 X Red Alder	.35, .35, .45	West of house site (outside SPEA)	Danger tree - Remove
39	Western Hemlock	0.45	West of house site (outside SPEA)	Danger tree (striking distance of neighbour's house) - Remove
40	Western Hemlock	0.3	West of house site (outside SPEA)	Stem defect at base of tree. Reduce or Remove
41	Western Hemlock	0.5	West of house site (outside SPEA)	Danger tree (striking distance of neighbour's house) - Reduce or Remove
42	Red Alder	0.33	West of house site (outside SPEA)	Reduce or Remove
43	Western Hemlock	0.75	West of house site (outside SPEA)	Dominant tree within striking distance of neighbour's house. Reduce.
44	Red Alder	0.3	West of house site (outside SPEA)	Lean toward neigbour's house. Reduce or Remove
19 SPEA TREES				
2	Sitka Spruce	0.4	Bottom-of-bank (SPEA tree)	Retain
13	Western Hemlock	0.4	Mid-bank (SPEA tree)	Retain
14	Douglas Fir	0.55	Mid-bank (SPEA tree)	Dominant tree within striking distance of neighbour's house. Reduce.
15	Red Alder	0.4	Mid-bank (SPEA tree)	Within striking distance of neighbour's house. Reduce.
16	Red Alder	0.6	Top-of-bank (SPEA tree)	Danger tree - Remove or convert to Wildlife Tree
17	Western Hemlock	0.25	Top-of-bank (SPEA tree)	Retain
18	Western Hemlock	0.35	Top-of-bank (SPEA tree)	Lean toward house - Reduce
19	Western Hemlock	0.3	Top-of-bank (SPEA tree)	Retain
20	Red Alder snag	0.8	Top-of-bank (SPEA tree)	Retain
21	Douglas Fir	0.65	Top-of-bank (SPEA tree)	Reduce
22	Western Hemlock	0.3	Top-of-bank (SPEA tree)	Close to house site - retain if possible; convert to Wildlife Tree or remove only if necessary
23	Red Alder snag	0.8	Top-of-bank (SPEA tree)	Retain
24	Western Hemlock	0.2	Top-of-bank (SPEA tree)	Retain
25	Western Hemlock	0.45	Top-of-bank (SPEA tree)	Retain
26	Red Alder	0.4	Top-of-bank (SPEA tree)	Retain
27	Red Alder	0.45	Top-of-bank (SPEA tree)	Retain
28	Red Alder	0.45	Top-of-bank (SPEA tree)	Retain
29	Red Alder	0.33	Top-of-bank (SPEA tree)	Retain
30	Douglas Fir	0.75	Top-of-bank (SPEA tree)	Isolated, dominant tree to windward. Reduce.

NORTH-BANK TREES

Tree #	Common Name	DBH (m)	Location	Notes	Recommended Action
640	Western Hemlock	0.45	North bank, top-of-slope	Dominant canopy position, located to prevailing windward side of stand. Sparse, distressed foliage.	Reduce by 33% (retain for wildlife tree value)
641	Douglas Fir	0.6	North bank, top-of-slope	Isolated in stand. Needle drop.	Reduce by 15%.
642	Western Hemlock	0.45	North bank, top-of-slope	Poor condition. Danger tree.	Remove
643	Sitka Spruce	0.7	North bank, mid-slope	Dominant canopy position; exposed to prevailing winds from s.w.; resinosis.	Reduce by 20%
644	Western Hemlock	0.65	North bank, bottom-of-slope	Bottom-of-bank; poor live crown ratio; poor height-to-girth ratio; sparse canopy; multiple stem defects.	Convert to wildlife tree. Reduce by 33%.
645	Douglas Fir	0.45	North bank, top-of-slope	Stem defects. Danger tree.	Remove
646	Western Hemlock	0.35	North bank, top-of-slope	Danger tree.	Remove
647	Western Hemlock	0.7	North bank, top-of-slope	Danger tree.	Reduce by 20%
648	Western Hemlock	0.85	North bank, top-of-slope	Danger tree.	Reduce by 25%
649	Western Hemlock	0.5	North bank, top-of-slope	Co-dominant leaders; witches broom; located at top-of-bank; slight lean toward creek.	Convert to wildlife tree. Reduce by 50%
650	Douglas Fir	0.6	North bank, top-of-slope	Previously topped.	Retain
651	Western Hemlock	0.5	North bank, mid-slope	Sub-dominant stem; stem defect at base; butt rot and root decay; weighted toward creek.	Reduce by 33%
652	Western Hemlock	0.45	North bank, mid-slope	Co-dominant stems; danger tree	Reduce by 33%
653	Western Red Cedar	0.6	North bank, mid-slope	Co-dominant stems.	Reduce by 20%
654	Western Hemlock	0.4	North bank, mid-slope	Mid-bank slope position; lean toward creek.	Reduce by 20%
655	Sitka Spruce	0.7	North bank, mid-slope	Dominant canopy position; butt rot, large cat face	Convert to wildlife tree. Reduce by 30%
656	Western Hemlock	0.35	North bank, mid-slope	Co-dominant stems; lean toward creek.	Convert to wildlife tree. Reduce by 30%
657	Western Hemlock	.45, .5	North bank, mid-slope	Co-dominant stems; danger tree	Remove

Appendix –2: Tree Protection Fencing Detail

Robust Tree Protection Fencing shall be constructed with a 2x4 frame and supports. (See photo below.) Snow-fencing will then be affixed to the frame using zip-ties, staples wire or nails. All-weather signage will be attached, clearly designating the area within as a TREE PROTECTION AREA – NO TRESPASSING.



Gye and Associates Ltd.

Consultants in Urban Forestry and Arboriculture

November 10, 2010

ERIC PATTISON ARCHITECT
202 - 204 Sixth Street
New Westminster, BC V3L 3A1
T 604.525.3232 F 604.525.3002
eric@eparchitect.ca

Attention: Eric Pattison

Re: Lot 113, Denwood Place, Shearingham Estates, Sooke, BC
Riparian Area Regulation Tree Assessment Update

Dear Eric,

As requested, I re-inspected the above site on the afternoon of Friday, October 22, 2010. I found no material changes to the tree resource from those conditions described in our R.A.R. report of June 25th, 2007. All of the trees surveyed within the S.P.E.A. remain undisturbed. Trees on the north bank of the creek adjacent to the SPEA that were identified as hazardous to the adjoining property have been abated (reference my report of September 18th, 2007).

Respectfully submitted,

Jeremy Gye - Consulting Arborist
I.S.A. Certification # PN-0144

Victoria Office: 5965 Wallace Drive, Victoria, BC V9E 2G7
Phone: (250)544-1700 Fax: (250) 544-2059 Toll Free: (800) 667-2877
jgye@shaw.ca

Vancouver Office:
Phone: (604) 628-2199 Fax: (250) 544-2059

Appendix 3. Geotechnical Report

Obtained from Richard Brimmel, PEng.

Richard Brimmell, P.Eng.
971 Bank St., Victoria, B.C.
V8S 4B1
Phone: 592-7645 Fax: 592-7640
Mobile: 889-3080

Kerr Wood Leidal
201-3045 Douglas St.
Victoria, B.C.
V8T 4N2
Attention: Christoph Moch, P.Eng

January 29/07
File 06-179

Dear Sir: Re: Proposed Home, 113 Denewood Place, Sheringham Estates
Geotechnical Considerations

This report presents my findings of January 26 at the above site, in company with Ms. Lehna Malmkvist [Ecologist] and provides recommendations for building construction. Drawing 1 is attached.

The site is on the west [based on project North] side of Denewood Place. A creek flows eastward within a small ravine through the property. There is a relatively level site, outside the ravine, within the southeast [front, left] corner of the property. The subject property is treed and undeveloped.

Drawing 1 presents a slope profile measured during the site meeting. The profile was measured from approximately the back [west end] of the house site northward down into the ravine. As shown the slope is steep, with a vertical scarp at the crest, and there is a relatively level flood-plain between the base of the slope and the creek channel. The creek is not actively eroding the ravine slope. Glacial till was noted in the scarp near the top-of-slope. Soil conditions at the proposed house site are believed to consist of organics/topsoil; overlying weathered, silty till; in turn overlying compact to dense, silt/sand/gravel till. The creek channel consists of cobbles.

It is understood that the "no build" riparian zone encompasses the flood plain adjacent to the creek, the ravine slope, and a 2 m wide strip just south of the crest-of-slope. The proposed house site is within the southeasterly [front, left] corner of the property between a 1.5 m setback from the south property line and the riparian zone associated with the creek.

Provided foundation construction is handled appropriately, as discussed below, it is not considered necessary to encroach into or disturb the riparian zone. Is recommended that foundations along the north [toward the creek] side of the home consist of four or five, north-south oriented "finwalls" supporting a grade beam. The concept is illustrated on Drawing 1, and described as follows:

-With the backhoe working from the south side, excavate each finwall site down to 1.5 m [5 ft.] below existing grade. Each finwall is to be 1.2 m 4 ft.] long.

-Form each finwall to be poured monolithically [footing and wall together]. The footing should be at least 500 mm [20 in.] wide, based on a bearing pressure of 100 kPa [2000 psf]. Walls to be 200 mm [8 in.] thick.

-After pouring the finwalls and stripping the forms, line both sides of each wall with 6 mil poly then backfill with suitable, granular material compacted, in lifts, with a jumping jack.

-Again working from the south [away from the creek] side, trench for the grade beam. The base of the trench should be between 350 mm & 450 mm [14 & 18 In.] below existing grade.

-Form and pour the grade beam.

The above foundation should be designed by qualified structural engineer. Foundations south of the north wall may be constructed conventionally on competent bearing, based on a bearing pressure of 100 kPa and a minimum footing width of 400 mm [16 in.].

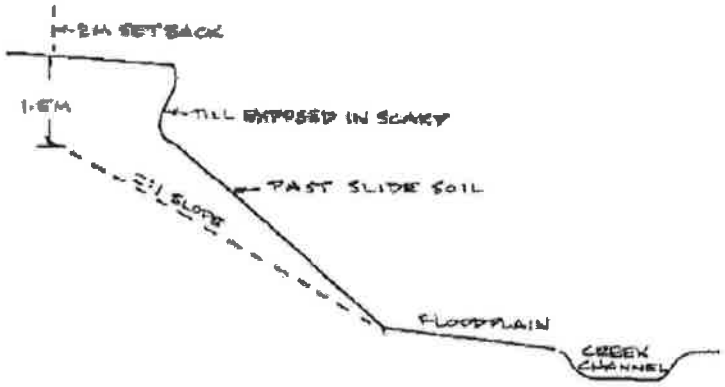
If a minor slide should occur, there is a possibility that soil could fall out from beneath the grade beam. For this reason, consideration should be given to constructing the ground floor over a crawlspace, rather than as a slab-on-grade.

I trust that this information meets your present requirements. Please do not hesitate to call if there are any questions.

Yours truly,

Richard Brimmell, P.Eng

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
R. C. BRIMMELL



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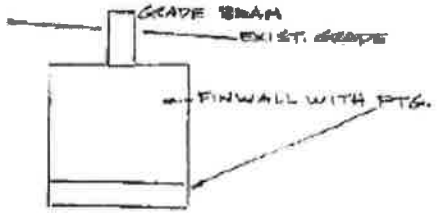

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Project: Lot 113 Deerwood Place, Sherringham Estates	**DRAWING 1** **File Number: 09-179**	**Drawing Name: Slope Profile & Foundation Concept**
Client: Kerr Wood Liedal	**Date: January 30/07**	**Richard Brimmell, P. Eng**

Brimmell Engineering
971 Bank St., Victoria, B.C.
V8S 4B1
Phone: 250-592-7645 Fax: 250-592-7640
rbrimmell@pacificcoast.net

Eric Pattison Architect
202-204 Sixth St.
New Westminster, BC

October 26/10
File 06-179

Dear Sir: Re: Lot 113, 947 Denewood Place, Sheringham Estates, Shirley, BC
Geotechnical Considerations

As requested, I have revisited the above site to confirm that site conditions have not changed since the January 26, 2007 assessment carried out with Ms. Lehna Malmkvist. This report reiterates most of the information from the January 29/07 report, with added commentary about the septic field area to the west of the proposed house site. Drawing 1 of the original report is appended.

The site is on the west side of Denewood Place. Goudie Creek flows within a small ravine through the property, which is treed and undeveloped. There is a relatively level area, outside the ravine, within the southeast (front, left) corner where a home is proposed. The septic field will be to the west of the building site. Both these sites are located in the relatively narrow strip of ground between the "no build" riparian zone and a 1.5 m setback from the south property line.

Drawing 1 presents the slope profile measured during the January/07 meeting. The profile is measured from approximately the back (west end) of the house site northward down into the routine. As shown the slope is steep, with a vertical scarp at the crest. There is a relatively level floodplain between the base of the slope and the creek channel. Glacial till was noted in the scarp near the top-of-slope. Soil conditions at the proposed house site are believed to consist of organics/topsoil; overlying weathered till; in turn overlying compact to dense, silt/sand/gravel till. The creek channel consists of cobbles.

Provided foundation construction is handled appropriately, as discussed below, it is not considered necessary to encroach into or disturb the riparian zone. It is recommended that foundations along the north side of the home consist of four or five, north-south oriented "finwalls" supporting a grade beam. The concept is illustrated on Drawing 1 and described as follows:

- With the backhoe working from the south side, excavate each finwall site down 1.5 m below existing grade. Each finwall is to be 1.2 m long.
- Form each finwall to be poured monolithically (footing and wall together). The footings should be at least 500 mm wide, based on a bearing pressure 100 kPa. The walls are to be 200 mm thick. Reinforcement for the finwalls and grade beam would be as directed by the structural engineer.
- After pouring the finwalls and stripping the forms, line both sides of each wall with 6 mil poly then backfill with suitable, granular material compacted, in lifts, with a jumping jack or similar.

-Again working from the south side, trench for the grade beam. The base of the trench should be between 350 & 450 mm below existing grade.

Foundations south of the north wall may be constructed conventionally on competent native soil, based on a bearing pressure of 100 kPa and a minimum footing width of 400 mm.

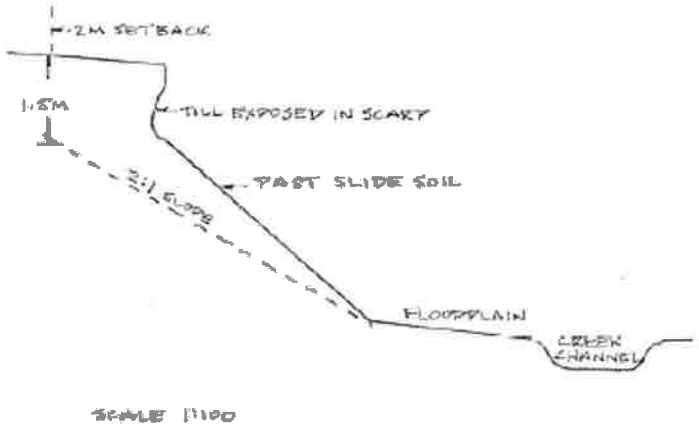
If a minor slide should occur, there is a possibility that soil could fall out from beneath the grade beam. For this reason consideration should be given to constructing the ground floor over a crawlspace, rather than as a slab-on-grade.

To the north of the proposed septic field site the slope down to the Goudie Creek floodplain is more moderate than adjacent to the house site, and supports mature trees indicative of long-term stability. Therefore, the septic field site is not considered to be prone to slope instability issues.

I trust that this information meets your present requirements. Please do not hesitate to call if there are any questions.

Yours truly,

Richard Brimmell, P.Eng.



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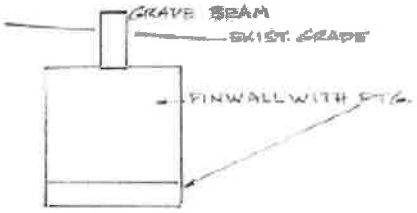

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Project: Lot 113 Deerwood Place, Sherringham Estates	**DRAWING 1** **File Number: 06-179**	**Drawing Name: Slope Profile & Foundation Concept**
Client: Kerr Wood Liedal	**Date: January 30/07**	**Richard Brimmell, P. Eng**

Appendix 4. Sewage Treatment Report

2010 Report by Wendy Yao, PEng and Rob Warrant, PEng., Kerr Wood Leidal and Associates Ltd.

KERR WOOD LEIDAL
associates limited
CONSULTING ENGINEERS
201 - 3045 Douglas Street
Victoria, B.C.
V8T 4N2
250-595-4223 P
250-595-4224 F
www.kwl.ca

November 5, 2010

Mr. Eric Pattison
202 – 204 Sixth Street
New Westminster, BC
V3L 3A1

Dear Mr. Pattison:

RE: Sewage Disposal System, 947 Denewood Place, Sooke
Engineering Design Information Update 2010
Our File 2421.001-200

To support a new building application to the Capital Regional District (CRD) for your property at 947 Denewood Place, Sooke, you have recently requested KWL to review the design information for the sewage disposal system provided in our February 28, 2007 Technical Memorandum, to confirm the applicability of the proposed design and its compliance with today's standards and requirements. You have furthermore requested that we comment on the risk of sewage effluent breakout and system inherent safety features minimizing this risk. This letter summaries our responses to your requests.

Design Requirements

The aforementioned 2007 Technical Memorandum compiled the results of geotechnical and environmental field investigations as well as legal survey information, and recommended a Type 3 Glendon BioFilter sewage treatment and disposal system in accordance with the B.C. Sewerage System Regulations under the provincial Health Act.

To confirm whether the conclusions and recommendations of the 2007 Technical Memorandum are still valid, four conditions should be checked:

1) Are the design parameters still the same? Are there any changes to the proposed development?
2) Have the site conditions (geotechnical, topographical, legal) changed or been altered since February 2007?
3) Have applicable regulations and standards changed since February 2007 in ways that would affect this project?
4) Is the proposed system is still available and be claimed as a suitable system to meet the regulatory requirements?

Comments on Item 1:

You have stated that it is still your intention to apply for a building permit for a 3 bedroom residence on the subject property. The design sewage flow and raw sewage characteristics assumed in the 2007 Technical Memorandum remain unchanged and valid today.

Comments on Item 2:

Richard Brimmel, P.Eng, the geotechnical engineer who performed the geotechnical site investigations in 2006/2007, confirmed in his letter of October 26, 2010 that based on his recent site visit, the site conditions in terms of land layout, soil conditions and creek/bank course are unchanged since 2007. The legal boundaries of the subject lot also remain unchanged since 2007.

Comments on Item 3:

The September 2007 edition of the Sewerage System Standard Practice Manual (SPM) of the B.C. Sewerage System Regulations under the provincial Health Act is the latest regulatory document governing the requirements for a small onsite treatment and ground disposal system. All design considerations in the 2007 Technical Memorandum meet the requirements in the 2007 SPM regulations.

Comments on Item 4:

The proposed Glendon Biofilter system is a Type 3 system approved by the Health Authority and is in full compliance with current regulations and requirements in British Columbia. Glendon Biofilter Technology Inc, the manufacturer and installer from Washington State for the Glendon Biofilter Systems is still in business.

However, the M31 unit proposed in the 2007 Memo is no longer supplied by the manufacture. The manufacture has made changes to the proprietary filter media since 2007. We recommend that the M31 unit be replaced by the currently available M32 unit, which is a very similar system and have the same design parameter as for M31. The dimensions of the M32 biofilter tank are slightly smaller than M31 due to media change.

Based on the above, we conclude that the 2007 Technical Memorandum in its entirety is deemed appropriate to support a new building permit application for 947 Denewood Place, Sooke. The only change needed is to replace the M31 Glendon Biofilter unit with a M32 unit (shown in Appendix D of the 2007 Memo).

Effluent Breakout Concerns

The risk for effluent breakout at the creek bank is considered very low due to the linear distance to the edge of the absorption area and the very low hydraulic loading rate from a 3 bedroom residence.

However, should there ever occur such a breakout at the embankment, the effluent at this breakout point would not cause water quality deterioration in the creek due to the high level treatment provided onsite. The recommended Glendon Biofilter system is a state of the art sewage treatment and disposal system achieving and often exceeding the most stringent treatment requirements of a Type 3 (see B.C. Sewerage System Regulation) system. The treated effluent from the Glendon Biofilter system will also pass through an absorption area which provides additional treatment to the effluent. In addition to the required 100% absorption area, the 2007 design included the provision of a 100% reserve absorption area. This 100% absorption field redundancy is not required by the current standards. It is an extra safety factor that enables this system to compensate for fatigue overtime or for unprecedented emergency situations. This design guarantees a high level of treatment and a high level of effluent quality with minimal risk of malfunctioning and to the receiving environment.

We hope the above would dispel any doubts about the feasibility of the proposed design under the given site conditions. If you have any questions please feel free to contact the undersigned.

Yours truly,

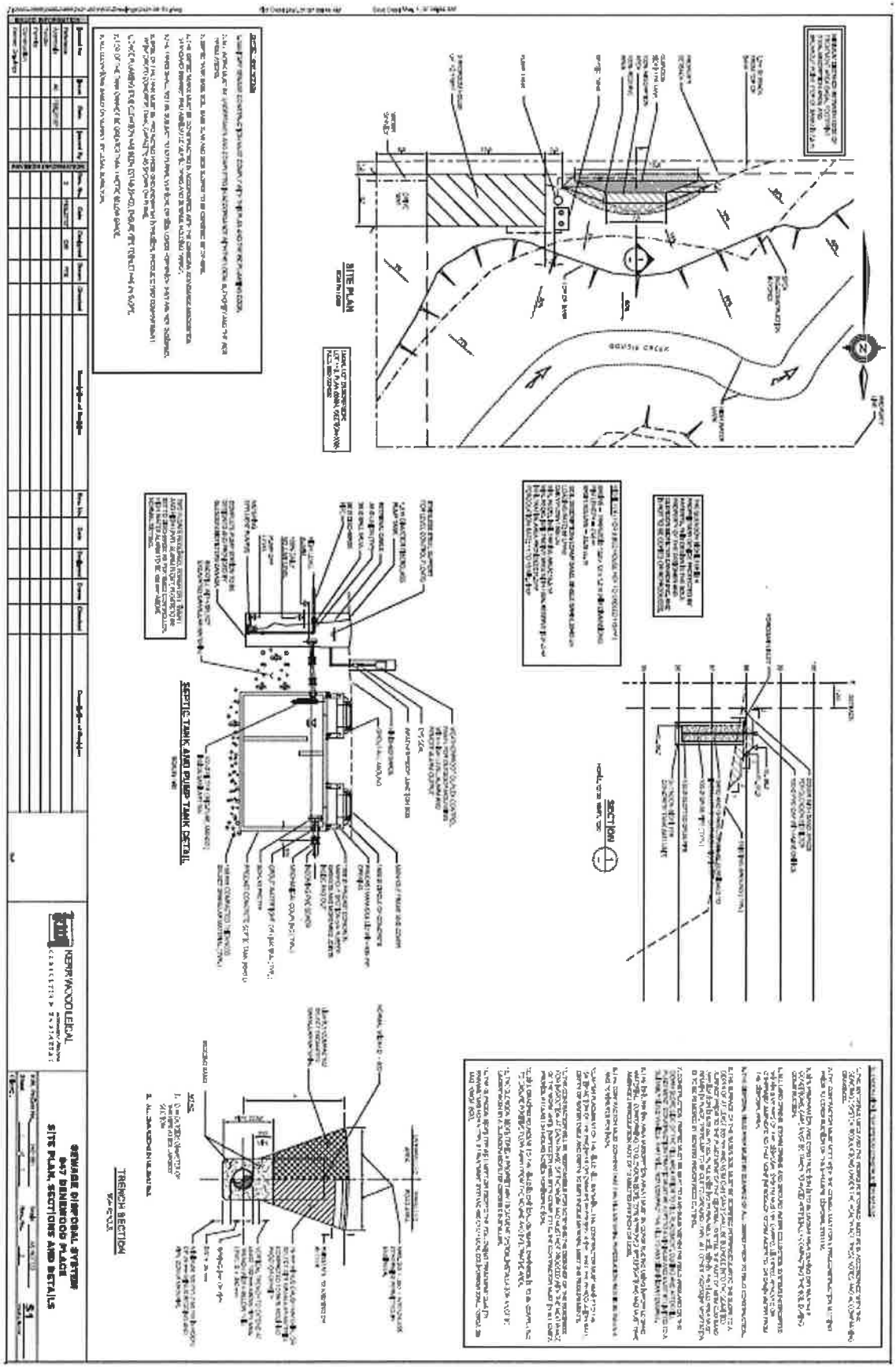
KERR WOOD LEIDAL ASSOCIATES LTD.

Prepared by:

Wendy Yao, M.A.Sc., P.Eng.
Project Manager

Reviewed by:

Rob Warren, P.Eng.
Technical Reviewer


SEWAGE DISPOSAL SYSTEM
847 BENEWOOD PLACE
SITE PLAN, SECTIONS AND DETAILS
KERR WOOD LEIDAL
SITE PLAN
SECTION
SEPTIC TANK AND PUMP TANK DETAIL
TRENCH SECTION

Brimmell Engineering
971 Bank St., Victoria, B.C.
V8S 4B1
Phone: 250-592-7645 Fax: 250-592-7640
rbrimmell@pacificcoast.net

Eric Pattison Architect
202-204 Sixth St.
New Westminster, BC

October 26/10-Revised July 12/11
File 06-179

Dear Sir: Re: Lot 113, 947 Denewood Place, Sheringham Estates, Shirley, BC
Geotechnical Considerations

As requested, I have revisited the above site to confirm that site conditions have not changed since the January 26, 2007 assessment carried out with Ms. Lehna Malmkvist. This report reiterates most of the information from the January 29/07 report, with added commentary about the septic field area to the west of the proposed house site. Drawing 1 of the original report is appended.

The site is on the west side of Denewood Place. Goudie Creek flows westward within a small ravine through the property, which is treed and undeveloped. There is a relatively level area, outside the ravine, within the southeast (front, left) corner where a home is proposed. The septic field will be to the west of the building site. Both these sites are located in the relatively narrow strip of ground between the "no build" riparian zone and a 1.5 m setback from the south property line.

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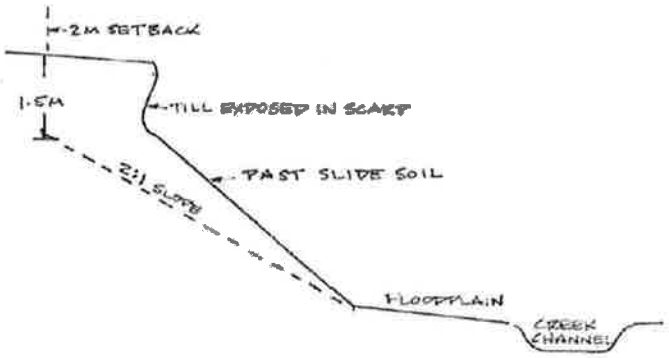
To the north of the proposed septic field site the slope down to the Goudie Creek floodplain is more moderate than adjacent to the house site, and supports mature trees indicative of long-term stability. Therefore, the septic field site is not considered to be prone to slope instability issues.

In accordance with the foregoing, and with respect to potential geotechnical hazards including flooding, it is confirmed that the land may be used safely for the intended usage of single-family residential construction. It is confirmed that the requirements for legislated Landslide Assessments (seismic design event of 2% probability in 50 years of exceedance) has been considered when assessing the site.

I trust that this information meets your present requirements. Please do not hesitate to call if there are any questions.

Yours truly,

Richard Brimmell, P.Eng.



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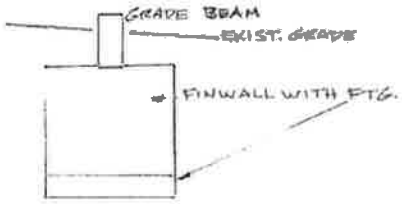

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Project: Lot 113 Deerwood Place, Sheringham Estates	**DRAWING 1** **File Number: 06-179**	**Drawing Name: Slope Profile & Foundation Concept**
Client: Kerr Wood Liedal	**Date: January 30/07**	**Richard Brimmell, P. Eng**