

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

Riparian Areas Regulation: Assessment Report

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

Date **December 23 2008****I. Primary QEP Information**

First Name	Brenda	M
Last Name	Miskimmin	
Designation	R.P.Bio.	Summit Environmental Consultants Ltd.
Registration #	1845	bm@summit-environmental.com
Address	#200 – 2800 29 th Street	
City	Vernon	Postal/Zip V1T 7M3
Prov/state	BC	Country Canada
		Phone # 250-545-3674

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

First Name		Middle Name
Last Name		
Designation		Company
Registration #		Email
Address		
City	Postal/Zip	Phone #
Prov/state	Country	

III. Developer Information

First Name	Monty	Middle Name
Last Name	Willis	
Company	Merganser Bay Resort (previously Kokanee Lodge Resort)	
Phone #	250-547-6517	Email S22
Address	1681 Sugar Lake Road	
City	Lumby	Postal/Zip V0E 2G2
Prov/state	BC	Country Canada

IV. Development Information

Development Type	Other (Landscaping and Utility)		
Area of Development (ha)	0.1383	Riparian Length (m)	189
Lot Area (ha)	0.6208	Nature of Development	Re-development
Proposed Start Date	5 Jan 2009	Proposed End Date	15 May 2010

V. Location of Proposed Development

Street Address (or nearest town)	1681 Sugar Lake Road		
Local Government	North Okanagan Regional District	City	Lumby
Stream Name	Sugar Lake		
Legal Description (PID)	025-747-673 (District Lot 5306)	Region	Okanagan
Stream/River Type	Lake	DFO Area	BC Interior
Watershed Code	128-835500		
Latitude	50°	21'	21"
		118°	32'
			24"

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

Table of Contents for Assessment Report

Number	Page
1. Description of Fisheries Resources Values	3
2. Results of Riparian Assessment (SPEA width)	6
3. Site Plan	8
4. Measures to Protect and Maintain the SPEA (detailed methodology only).	
1. Danger Trees.....	9
2. Windthrow.....	9
3. Slope Stability.....	9
4. Protection of Trees.....	9
5. Encroachment	9
6. Sediment and Erosion Control.....	10
7. Floodplain.....	10
8. Stormwater Management.....	10
5. Environmental Monitoring	11
6. Photos	11
7. Assessment Report Professional Opinion	13

Section 1. Description of Fisheries Resources Values and a Description of the Development proposal

(Provide as a minimum: Species present, type of fish habitat present, description of current riparian vegetation condition, connectivity to downstream habitats, nature of development, specific activities proposed, timelines)

Background

The Merganser Bay Resort is located on two neighbouring properties. A RAR assessment report was completed on the north property to extend utility services and for construction outside of 15 meters (**RAR Assessment # 257**), which was the determined SPEA (Streamside Protection and Enhancement Area).

Because the new development plan for Lot 1 DL 2166 and 5306, Plan KA78195, O.D.Y.D, includes the removal of mature riparian vegetation and disturbance of soil within 30 meters of Sugar Lake, a RAR report posted on the notification database for review by the Ministry of Environment (MOE) is required. In addition to the clearing of riparian vegetation, the proposed developments (mentioned below) within the 30 meter Riparian Assessment Area (RAA) require a RAR assessment. **The following RAR report is for the south property only.**

Prior to the assessment (November 20, 2008) important riparian vegetation was removed up to 8 m from the lake without authorization. To ensure compliance with the RAR, mitigation for the tree removal will be the focus of this RAR assessment report. The tree removal encroached the SPEA by approximately 636 m²; therefore a riparian enhancement plan was developed by Summit and attached to this document. .

Development Proposal Details

The following developments are proposed within the 30 meter RAA (See Site Plan in Section 3):

- A landscaped area, as part of the riparian enhancement plan, with subsurface irrigation located greater than 15 meters from the HWM;
- A block retaining wall (minimum 0.6 meters high) about 15 meters from the lake; and
- A utility line (BC Hydro and TELUS) on the landward side of the existing road within the SPEA and the Ministry of Transportation (MOT) right-of-way.

Other development proposed on the property but outside of the 30 meter RAA is

- A small building (about 17.2 m²) that will house a 1000 gallon tank and filter unit to process the resort effluent; and
- An effluent disposal field (about 1401 m²).

Fish Habitat

Sugar Lake has an area of 2080 ha and a shoreline length of 36 km. Most of the watershed is undisturbed with the exception of logging activities, construction of a few cabins, and Merganser Bay Resort (previously known as Kokanee Lodge and Resort). Although Sugar Lake was once a natural lake, the construction of the Sugar Lake Dam in 1928 significantly expanded the area of the lake (reservoir), especially when it is at full pool. Prior to dam construction, the outlet of Sugar Lake was located about 0.9 km upstream of its current location and the Shuswap River flowed past the current site of the property. During the winter and spring, when the reservoir is drawn down by BC Hydro, the water in front of the lodge again resembles the river, and the water is several metres lower than at full pool. The Shuswap River both upstream and downstream of Sugar Lake are connected, although the Dam prevents fish migration upstream from the Shuswap River to Sugar Lake.

The substrate along the property foreshore consists of mostly fines with some larger gravels

(greater than 6 cm) scattered throughout. This is not optimal spawning habitat for kokanee; however, kokanee and other species may use the property foreshore for juvenile rearing during periods of high water.

Fish Species Present

All waterbodies addressed in this assessment are considered fish-bearing or potentially fish-bearing. Thirteen fish species have been documented in Sugar Lake (see Table 1) of which four are salmonid species. The salmonids include bull trout, cutthroat trout, rainbow trout and kokanee.

Riparian Vegetation Condition

The site is located within the Interior Cedar Hemlock biogeoclimatic zone, moist-warm subzone, Columbia-Shuswap variant (ICHmw2). Baseline riparian vegetation includes native species such as western red cedar, black cottonwood, interior Douglas fir, western hemlock, as well as non-native weed species.

The riparian area consists of a narrow band of riparian vegetation along the lake and an access road, including the right-of-way (owned by the Ministry of Transportation), that is about 5 meters wide. Previously, this lot was used for RV sites and so the vegetation had been cleared in some areas. Now, the vegetation on the landward side of the road has been cleared up to 8 meters of the high water mark.

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

Section 2. Results of Detailed Riparian Assessment

Refer to Chapter 3 of Assessment Methodology

Date: December 23
2008

Description of Water bodies involved (number, type)	One, Sugar Lake
Stream	
Wetland	
Lake	YES
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		
upstream		
downstream		
Total: minus high /low mean		
	R/P	C/P
Channel Type		S/P

I, Brenda M. Miskimmin, 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 Merganser Bay Resort Inc ;

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

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Polygon No:	1		
	LC	SH	TR
SPVT Type			X

Method employed if other than TR

Polygon No:			
	LC	SH	TR
SPVT Type			

Method employed if other than TR

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

Polygon No:		Method employed if other than TR
SPVT Type		

Zone of Sensitivity (ZOS) and resultant SPEA

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)	15					
Litter fall and insect drop ZOS (m)	15					
Shade ZOS (m) max	15	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	15	(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)				

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, <u>Brenda M. Miskimmin</u> , hereby certify that:	
a)	I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ;
b)	I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ;
c)	I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and
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Comments

The shoreline of the property faces east; therefore the calculated **SPEA width is 15 m** from the HWM of Sugar Lake. All development is proposed outside of the 15 m setback and is therefore compliant with RAR. A riparian enhancement plan is outlined below to mitigate for the removal of mature riparian trees within the setback area (636 m²).

Riparian Enhancement Plan

Since the vegetation was removed prior to an assessment, the number of trees removed from within 15 meters of the lake is unknown. The area within the setback had some mature riparian trees with open areas used for RV sites (M. Willis pers. Comm.)

We recommend the riparian enhancement plan be based on the target Stocking Standards for the Kamloops Forest Region¹ and applied to the amount of area encroached (estimated 636 m²). The understory of forest in the adjacent crown land area is considerably open; therefore, replacing one shrub for every four m², also based on the area of encroachment, will adequately replace the vegetation that was removed. This will result in **77 replacement trees and 159 shrubs within 15 meters of the lake** (Areas 1 and 2 identified in Figure 2). These two areas will provide the greatest riparian benefit to the lake.

As outlined in Figure 2, the planting areas are as follows:

- Area 1: This area has limited available planting area because the MOT has already designated a majority of it for a future detention pond for surface-water run-off. Any exposed soil within the future detention pond area will be grass seeded to prevent sediment-laden water from entering to the lake. The remaining available area within Area 1 will be planted using the general guidelines listed below.
- Area 2: This area has not been previously cleared so planting will consist of filling in trees and shrubs where possible.
- Area 3: This area is located 15 meters to 30 meters from the lake (behind the retaining wall) and does not provide as much riparian value to the lake as Areas 1 and 2. Therefore, this area is to only be used as an option if Area 1 and 2 have reached planting capacity. **For every four trees planted in this area, one tree will be counted toward the riparian planting requirements.**

In addition to the planting plan described above, the proponent will be encouraged to plant additional native vegetation beyond the 15 meter setback.

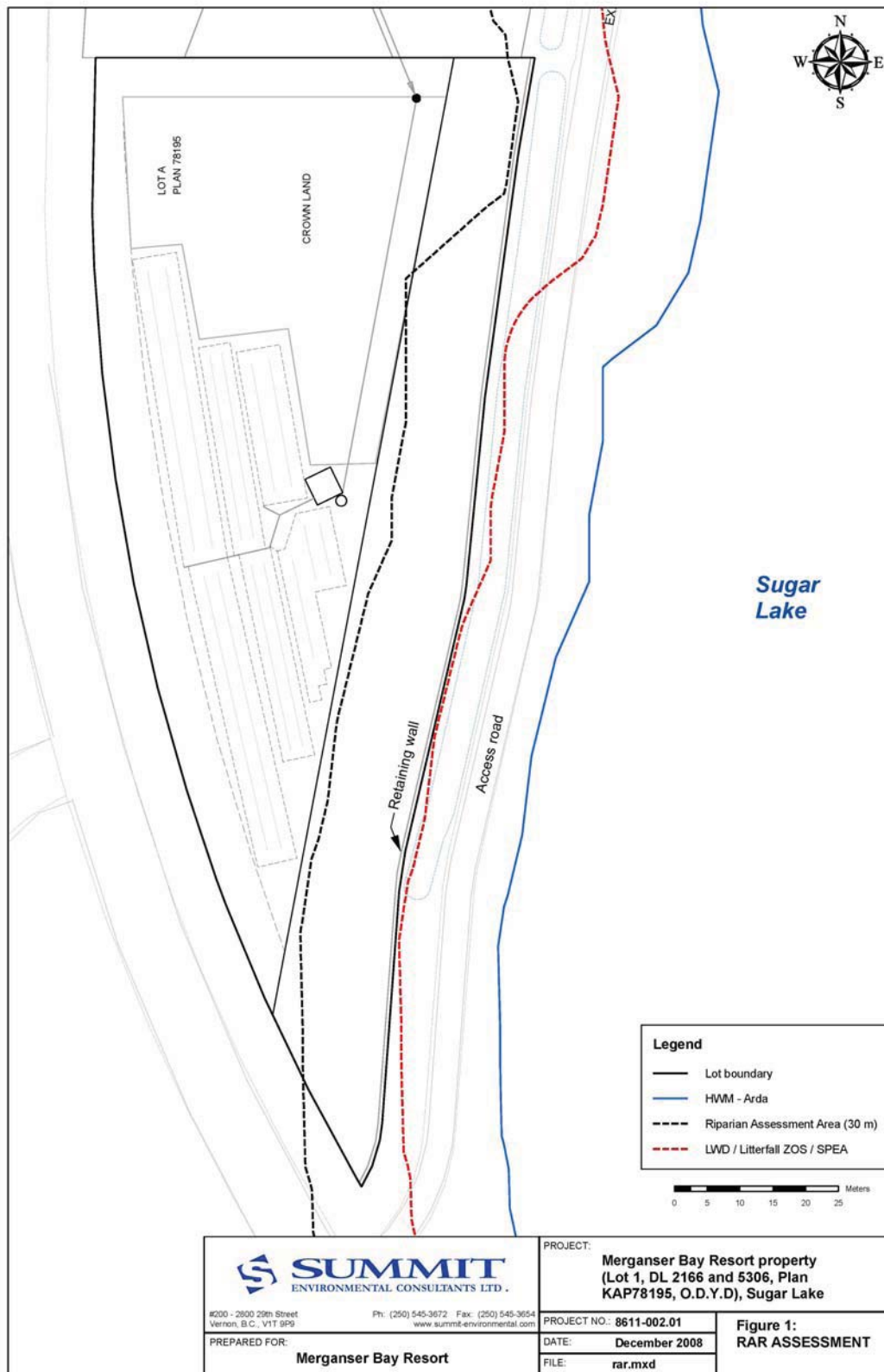
Some general guidelines for riparian enhancement planting

- The riparian area is to be planted with native species, 1 year old rooted stock and greater than 2 meters in height to provide the greatest riparian value.
- Replacement shrubs will be at least one gallon pot size; and
- All areas with exposed soils will be seeded immediately to prevent movement of soil towards the lake.

Native Species for Replanting

Only native species will be planted in the enhancement area. Suitable tree species for this property include paper birch, western hemlock, western white pine, western red cedar, interior Douglas fir, and hybrid white spruce. Native shrub species for this site may include rose, falsebox and black huckleberry.

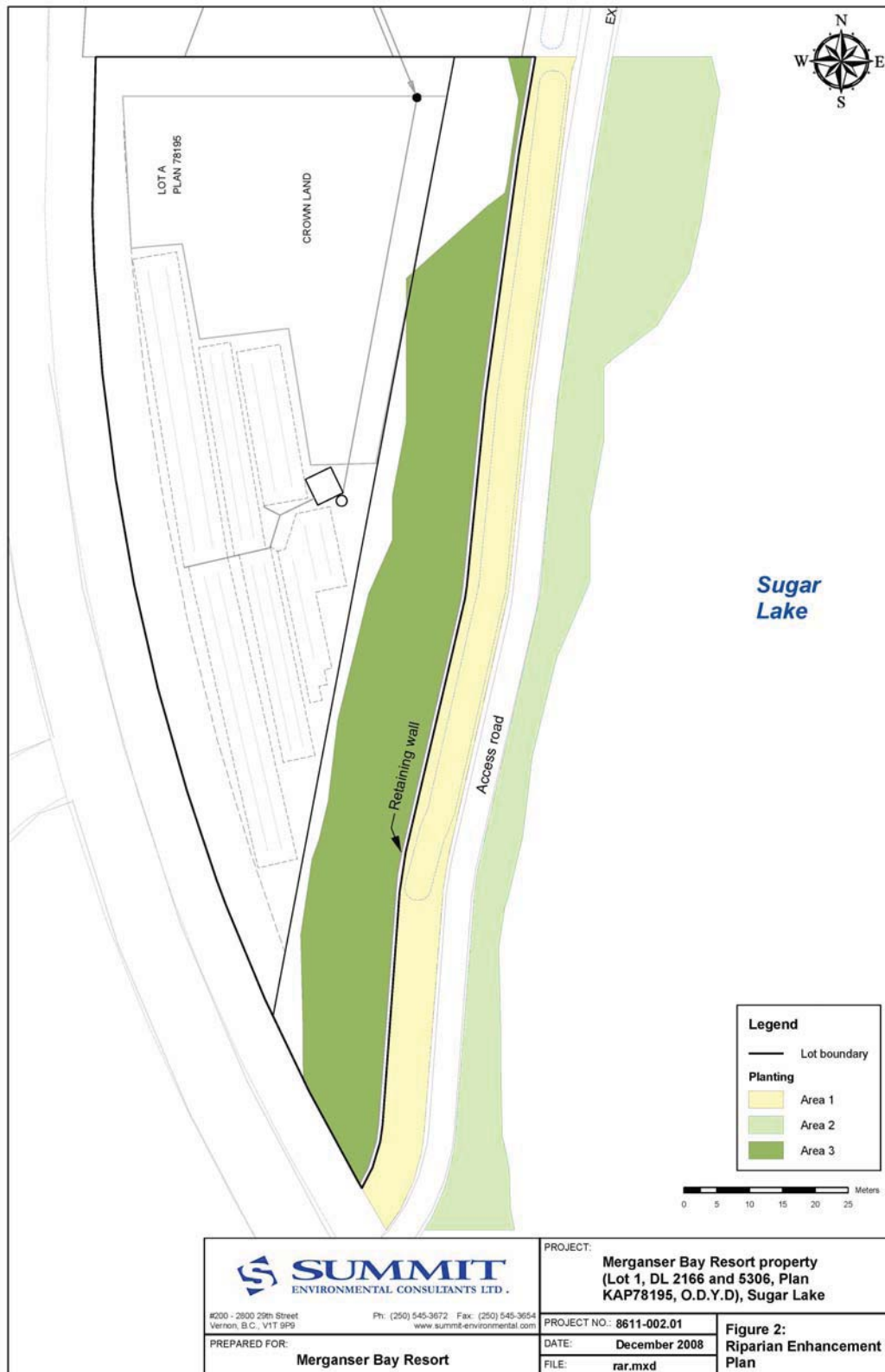
¹ Kamloops Forest Region: Reference Guide for FDP Stocking Standards
(http://www.for.gov.bc.ca/ftp/hfp/external/!publish/Stocking%20Standards%20for%20FDPs/Reference_Guide.pdf)

Section 3. Site Plan

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

Riparian Enhancement Plan -



FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

Section 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	Most of the trees on the property have been removed, except for a strip (about 2 to 4 meters wide) between the road and the HWM. There were no danger trees identified during the assessment, therefore danger trees are not a concern for the remaining development.
I, <u>Brenda M. Miskimmin</u> , hereby certify that: e) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; f) I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ; 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	The remaining trees along the water may or may not be affected by the removal of vegetation on the uphill side of the property.
I, <u>Brenda M. Miskimmin</u> , hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ; 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	Because the property is sloped towards the lake and the vegetation has been removed, silt fencing will be installed to prevent any potential erosion of soil or sediment laden water from entering the lake.
I, <u>Brenda M. Miskimmin</u> , hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ; 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	There are no trees left on the landward side of the road within the RAA. The remaining trees along the HWM will not be removed or disturbed.
I, <u>Brenda M. Miskimmin</u> , hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ; 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	The SPEA has been encroached. The riparian enhancement plan outlined above will provide mitigation for the loss of riparian trees.
I, <u>Brenda M. Miskimmin</u> , hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer	

FORM 1

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<p><u>Merganser Bay Resort Inc</u> ;</p> <p>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</p>	
<p>e. Sediment and Erosion Control</p>	<p>The subject property is sloped towards the lake therefore sediment and erosion control measures will be implemented.</p> <p>The following outlines site preparation and construction activities to be used onsite as best management practices (Chilibeck et al., 1992)</p> <p>1) All areas with exposed soils will be re-vegetated promptly with grass, especially where surface flows have potential to reach the lake. If re-vegetation cannot occur immediately, alternative sediment control methods will be employed. These can include the use of filter cloth and/or straw bale berms and/or silt fencing;</p> <p>2) Excavated materials will be stockpiled in areas where there is negligible potential for sediment to be transported to the lake; and</p> <p>3) In places where soils are to be placed near the SPEA, silt fencing will form an effective barrier to sediment transport.</p>
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ;</p> <p>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</p>	
<p>d. Stormwater Management</p>	<p>There are no stormwater concerns on-site from the developments as proposed. There are no impervious surfaces proposed within the 15 meter setback. The retaining wall will be 15 meters from the high water mark and the area behind it will be vegetated as part of the riparian enhancement plan. In addition, the area between the road and the new retaining wall will be grass seeded to prevent erosion and for stormwater capture.</p> <p><u>Important note: Existing stormwater issues onsite</u></p> <p>The Merganser Bay Resort is accessed by the Sugar Lake Forestry Road and a road maintained by the Ministry of Transportation (MOT). The culvert diverting stormwater from the Sugar Lake forestry road is known to transport large amount of silt/sediments into Sugar lake (see Photograph 2). In addition, a culvert along the MOT right-of-way is buried and requires maintenance (removal and/or replacement).</p> <p>It is not the responsibility of the developer/proponent to resolve the stormwater issues that are caused by others; however, these issues do occur on the property.</p>
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish</i></p>	

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

<i>Protection Act;</i> b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ; 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)	Not applicable because there is a BC Hydro dam-controlled high water level that is never exceeded.
I, <u>Brenda M. Miskimmin</u> , hereby certify that: f. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; g. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ; 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	

Section 5. Environmental Monitoring

Attach text or document files explaining the monitoring regimen Use your "return" button on your keyboard after each line. It is suggested that all document be converted to PDF *before* inserting into the PDF version of the assessment report. Include actions required, monitoring schedule, communications plan, and requirement for a post development report.

A Qualified Environmental Professional (QEP) will be retained as project environmental monitor (EM) by the proponent. The focus of monitoring will be on observing that there is no transportation of sediment-laden water to the lake because of loss of vegetation and movement of soil. In addition, monitoring will include requiring implementation of the Riparian Enhancement Plan as described earlier (Section 2).

The EM will visit the site during construction and then conduct a final site visit when construction is complete in order to document the effectiveness of described SPEA protection measures.

The post-development/construction report will summarize the degree of compliance with the above measures and document the effectiveness of SPEA protection measures. The QEP will post the report on the RAR database as required under RAR.

Section 6. Photos**Photos**

Photograph 1 A view of the Merganser Bay Resort property facing north west from the Sugar Lake Road bridge.




Photograph 2 A view of the silt being transported from the Sugar Lake Road culvert to Sugar Lake.



FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

<p>Photograph 3</p>	<p>A view of the vegetation retained on the southern tip of the property.</p> 
<p>Photograph 4</p>	<p>A view of the work site and removed riparian vegetation along the Ministry of Transportation Road right-of-way.</p> 

Section 7. Professional Opinion

Assessment Report Professional Opinion on the Development Proposal's riparian area.

Date

December 23 2008

1. I/We Brenda M. Miskimmin, Ph.D., R.P.Bio.

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 Merganser Bay Resort Inc., 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 as described to me by the developer and my/our assessment is set out in this Assessment Report; and
- d) In carrying out my/our assessment of the development proposal as described to me, and 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.

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Riparian Areas Regulation: Assessment Report

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Date December 23 2008
 Amended: January 15 2009

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First Name	Brenda	M
Last Name	Miskimmin	
Designation	R.P.Bio.	Summit Environmental Consultants Ltd.
Registration #	1845	bm@summit-environmental.com
Address	#200 – 2800 29 th Street	
City	Vernon	Postal/Zip V1T 7M3
Prov/state	BC	Country Canada
		Phone # 250-545-3674

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

First Name		Middle Name
Last Name		
Designation		Company
Registration #		Email
Address		
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Prov/state	Country	

III. Developer Information

First Name	Monty	Middle Name
Last Name	Willis	
Company	Merganser Bay Resort (previously Kokanee Lodge Resort)	
Phone #	250-547-6517	Email S22
Address	1681 Sugar Lake Road	
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Prov/state	BC	Country Canada

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Lot Area (ha)	0.6208	Nature of Development	Re-development
Proposed Start Date	5 Jan 2009	Proposed End Date	15 May 2010

V. Location of Proposed Development

Street Address (or nearest town)	1681 Sugar Lake Road		
Local Government	North Okanagan Regional District	City	Lumby
Stream Name	Sugar Lake		
Legal Description (PID)	025-747-673 (District Lot 5306)	Region	Okanagan
Stream/River Type	Lake	DFO Area	BC Interior
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Section 1. Description of Fisheries Resources Values and a Description of the Development proposal

(Provide as a minimum: Species present, type of fish habitat present, description of current riparian vegetation condition, connectivity to downstream habitats, nature of development, specific activities proposed, timelines)

This amended report addresses the three year monitoring plan for riparian enhancement plantings (page 13) and measures to prevent encroachment of the setback (page 10 to 11).

Background

The Merganser Bay Resort is located on two neighbouring properties. A RAR assessment report was completed on the north property to extend utility services and for construction outside of 15 meters (**RAR Assessment # 257**), which was the determined SPEA (Streamside Protection and Enhancement Area).

Because the new development plan for Lot 1 DL 2166 and 5306, Plan KA78195, O.D.Y.D, includes the removal of mature riparian vegetation and disturbance of soil within 30 meters of Sugar Lake, a RAR report posted on the notification database for review by the Ministry of Environment (MOE) is required. In addition to the clearing of riparian vegetation, the proposed developments (mentioned below) within the 30 meter Riparian Assessment Area (RAA) require a RAR assessment. **The following RAR report is for the south property only.**

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Other development proposed on the property but outside of the 30 meter RAA is

- A small building (about 17.2 m²) that will house a 1000 gallon tank and filter unit to process the resort effluent; and
- An effluent disposal field (about 1401 m²).

Fish Habitat

Sugar Lake has an area of 2080 ha and a shoreline length of 36 km. Most of the watershed is undisturbed with the exception of logging activities, construction of a few cabins, and Merganser Bay Resort (previously known as Kokanee Lodge and Resort). Although Sugar Lake was once a natural lake, the construction of the Sugar Lake Dam in 1928 significantly expanded the area of the lake (reservoir), especially when it is at full pool. Prior to dam construction, the outlet of Sugar Lake was located about 0.9 km upstream of its current location and the Shuswap River flowed past the current site of the property. During the winter and spring, when the reservoir is drawn down by BC Hydro, the water in front of the lodge again resembles the river, and the water is several metres lower than at full pool. The Shuswap River both upstream and downstream of Sugar Lake are connected, although the Dam prevents fish migration upstream from the

Shuswap River to Sugar Lake.

The substrate along the property foreshore consists of mostly fines with some larger gravels (greater than 6 cm) scattered throughout. This is not optimal spawning habitat for kokanee; however, kokanee and other species may use the property foreshore for juvenile rearing during periods of high water.

Fish Species Present

All waterbodies addressed in this assessment are considered fish-bearing or potentially fish-bearing. Thirteen fish species have been documented in Sugar Lake (see Table 1) of which four are salmonid species. The salmonids include bull trout, cutthroat trout, rainbow trout and kokanee.

Riparian Vegetation Condition

The site is located within the Interior Cedar Hemlock biogeoclimatic zone, moist-warm subzone, Columbia-Shuswap variant (ICHmw2). Baseline riparian vegetation includes native species such as western red cedar, black cottonwood, interior Douglas fir, western hemlock, as well as non-native weed species.

The riparian area consists of a narrow band of riparian vegetation along the lake and an access road, including the right-of-way (owned by the Ministry of Transportation), that is about 5 meters wide. Previously, this lot was used for RV sites and so the vegetation had been cleared in some areas. Now, the vegetation on the landward side of the road has been cleared up to 8 meters of the high water mark.

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Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

Section 2. Results of Detailed Riparian Assessment

Refer to Chapter 3 of Assessment Methodology

Date: December 23 2008
Amended: January 15 2009

Description of Water bodies involved (number, type)	One, Sugar Lake
Stream	
Wetland	
Lake	YES
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		
upstream		
downstream		
Total: minus high /low mean		
	R/P	C/P
Channel Type		S/P

I, Brenda M. Miskimmin, 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 Merganser Bay Resort Inc ;

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, Brenda M. Miskimmin, 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 Merganser Bay Resort Inc ;

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:	1		
	LC	SH	TR
SPVT Type			X

Method employed if other than TR

Polygon No:			
	LC	SH	TR
SPVT Type			

Method employed if other than TR

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Polygon No:		Method employed if other than TR	
SPVT Type			

Zone of Sensitivity (ZOS) and resultant SPEA

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)	15					
Litter fall and insect drop ZOS (m)	15					
Shade ZOS (m) max	15	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	15	(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)				

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, <u>Brenda M. Miskimmin</u> , hereby certify that:	
a)	I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ;
b)	I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ;
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

The shoreline of the property faces east; therefore the calculated **SPEA width is 15 m** from the HWM of Sugar Lake. All development is proposed outside of the 15 m setback and is therefore compliant with RAR. A riparian enhancement plan is outlined below to mitigate for the removal of mature riparian trees within the setback area (636 m²).

Riparian Enhancement Plan

Since the vegetation was removed prior to an assessment, the number of trees removed from within 15 meters of the lake is unknown. The area within the setback had some mature riparian

trees with open areas used for RV sites (M. Willis pers. Comm.)

We recommend the riparian enhancement plan be based on the target Stocking Standards for the Kamloops Forest Region¹ and applied to the amount of area encroached (estimated 636 m²). The understory of forest in the adjacent crown land area is considerably open; therefore, replacing one shrub for every four m², also based on the area of encroachment, will adequately replace the vegetation that was removed. This will result in **77 replacement trees and 159 shrubs within 15 meters of the lake** (Areas 1 and 2 identified in Figure 2). These two areas will provide the greatest riparian benefit to the lake.

As outlined in Figure 2, the planting areas are as follows:

- Area 1: This area has limited available planting area because the MOT has already designated a majority of it for a future detention pond for surface-water run-off. Any exposed soil within the future detention pond area will be grass seeded to prevent sediment-laden water from entering to the lake. The remaining available area within Area 1 will be planted using the general guidelines listed below.
- Area 2: This area has not been previously cleared so planting will consist of filling in trees and shrubs where possible.
- Area 3: This area is located 15 meters to 30 meters from the lake (behind the retaining wall) and does not provide as much riparian value to the lake as Areas 1 and 2. Therefore, this area is to only be used as an option if Area 1 and 2 have reached planting capacity. **For every four trees planted in this area, one tree will be counted toward the riparian planting requirements.**

In addition to the planting plan described above, the proponent will be encouraged to plant additional native vegetation beyond the 15 meter setback.

Some general guidelines for riparian enhancement planting

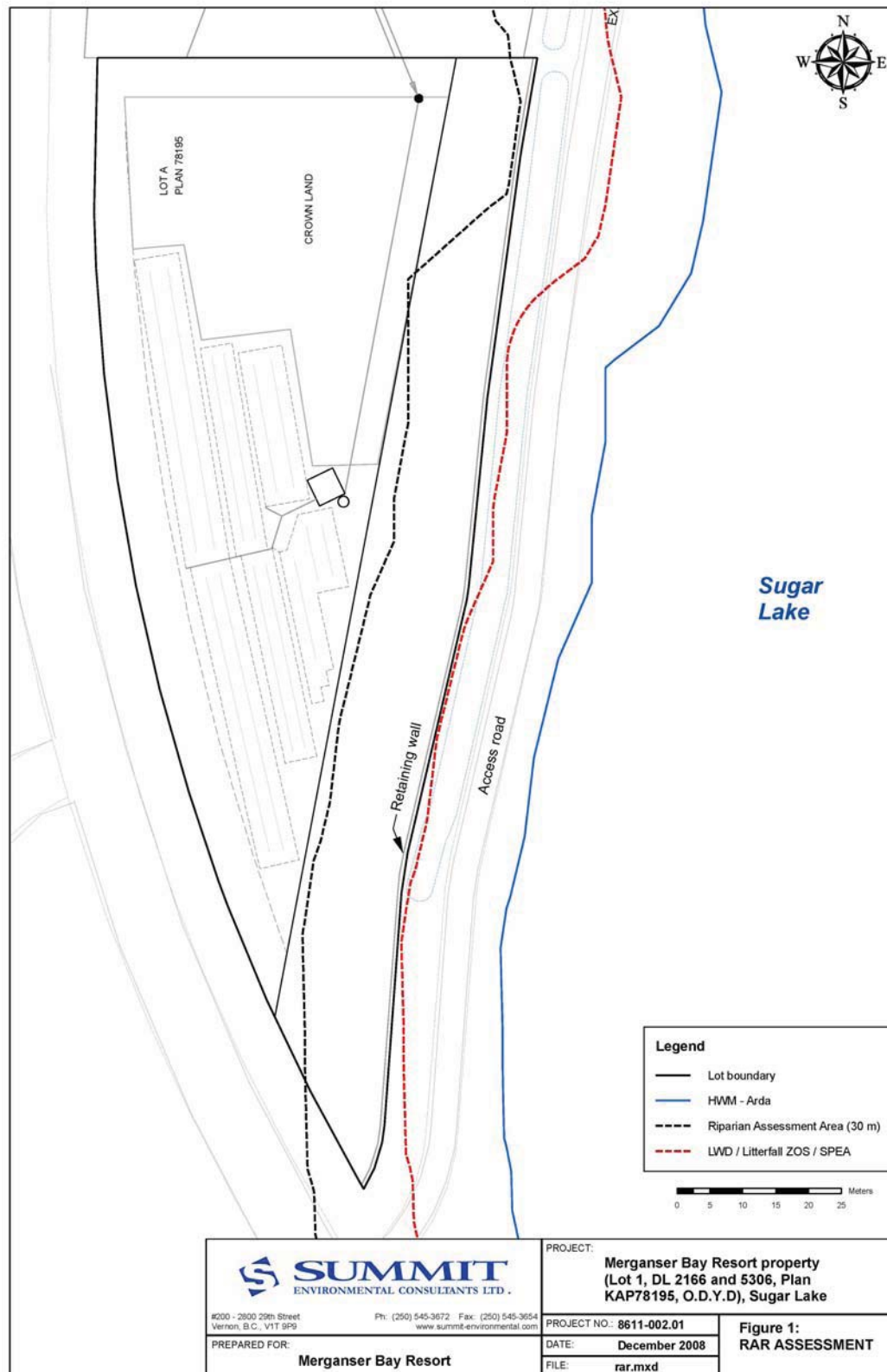
- The riparian area is to be planted with native species, 1 year old rooted stock and greater than 2 meters in height to provide the greatest riparian value.
- Replacement shrubs will be at least one gallon pot size; and
- All areas with exposed soils will be seeded immediately to prevent movement of soil towards the lake.

Native Species for Replanting

Only native species will be planted in the enhancement area. Suitable tree species for this property include paper birch, western hemlock, western white pine, western red cedar, interior Douglas fir, and hybrid white spruce. Native shrub species for this site may include rose, falsebox and black huckleberry.

Monitoring of the Riparian Enhancement Planting is covered in Section 5 below

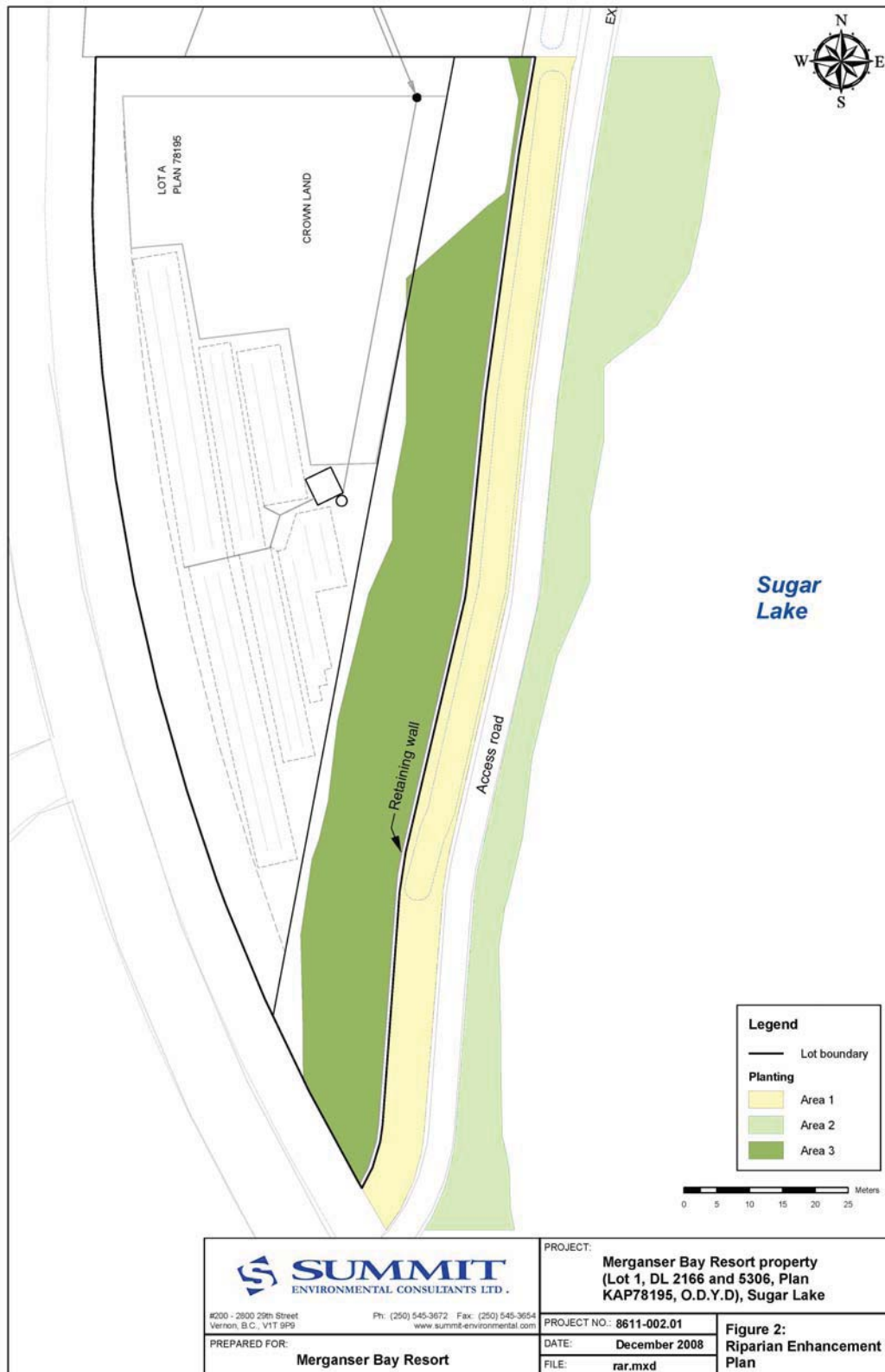
¹ Kamloops Forest Region: Reference Guide for FDP Stocking Standards
(http://www.for.gov.bc.ca/ftp/hfp/external/!publish/Stocking%20Standards%20for%20FDPs/Reference_Guide.pdf)

Section 3. Site Plan

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

Riparian Enhancement Plan -



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Section 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	Most of the trees on the property have been removed, except for a strip (about 2 to 4 meters wide) between the road and the HWM. There were no danger trees identified during the assessment, therefore danger trees are not a concern for the remaining development.
I, <u>Brenda M. Miskimmin</u> , hereby certify that: e) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; f) I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ; 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	The remaining trees along the water may or may not be affected by the removal of vegetation on the uphill side of the property.
I, <u>Brenda M. Miskimmin</u> , hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer _____ <u>Merganser Bay Resort Inc</u> ; 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	Because the property is sloped towards the lake and the vegetation has been removed, silt fencing will be installed to prevent any potential erosion of soil or sediment laden water from entering the lake.
I, <u>Brenda M. Miskimmin</u> , hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer _____ <u>Merganser Bay Resort Inc</u> ; 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	There are no trees left on the landward side of the road within the RAA. The remaining trees along the HWM will not be removed or disturbed.
I, <u>Brenda M. Miskimmin</u> , hereby certify that: a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b. I am qualified to carry out this part of the assessment of the development proposal made by the developer _____ <u>Merganser Bay Resort Inc</u> ; 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	The SPEA has been encroached. The riparian enhancement plan outlined above will provide mitigation for the loss of riparian trees. The environmental monitor will discuss the importance of SPEA protection with construction personnel and the

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	<p>property owner. The riparian enhancement plantings will be monitored for three years to target a survival rate of 80%.</p> <p>In the future, only danger/hazard trees are permitted to be removed within the SPEA. These trees must be deemed dangerous by a certified hazard tree assessor prior to removal and replaced according to the <u>DFO and MOE Tree Replacement Guidelines</u>.</p>
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ;</p> <p>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</p>	
<p>e. Sediment and Erosion Control</p>	<p>The subject property is sloped towards the lake therefore sediment and erosion control measures will be implemented.</p> <p>The following outlines site preparation and construction activities to be used onsite as best management practices (Chilibeck et al., 1992)</p> <p>1) All areas with exposed soils will be re-vegetated promptly with grass, especially where surface flows have potential to reach the lake. If re-vegetation cannot occur immediately, alternative sediment control methods will be employed. These can include the use of filter cloth and/or straw bale berms and/or silt fencing;</p> <p>2) Excavated materials will be stockpiled in areas where there is negligible potential for sediment to be transported to the lake; and</p> <p>3) In places where soils are to be placed near the SPEA, silt fencing will form an effective barrier to sediment transport.</p>
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ;</p> <p>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</p>	
<p>d. Stormwater Management</p>	<p>There are no stormwater concerns on-site from the developments as proposed. There are no impervious surfaces proposed within the 15 meter setback. The retaining wall will be 15 meters from the high water mark and the area behind it will be vegetated as part of the riparian enhancement plan. In addition, the area between the road and the new retaining wall will be grass seeded to prevent erosion and for stormwater capture.</p> <p><u>Important note: Existing stormwater issues onsite</u> The Merganser Bay Resort is accessed by the Sugar Lake Forestry Road and a road maintained by the Ministry of</p>

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

	<p>Transportation (MOT). The culvert diverting stormwater from the Sugar Lake forestry road is known to transport large amount of silt/sediments into Sugar lake (see Photograph 2). In addition, a culvert along the MOT right-of-way is buried and requires maintenance (removal and/or replacement).</p> <p>It is not the responsibility of the developer/proponent to resolve the stormwater issues that are caused by others; however, these issues do occur on the property.</p>
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Merganser Bay Resort Inc</u> ;</p> <p>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</p>	
<p>e. Floodplain Concerns (highly mobile channel)</p>	<p>Not applicable because there is a BC Hydro dam-controlled high water level that is never exceeded.</p>
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>f. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>g. I am qualified to carry out this part of the assessment of the development proposal made by the developer _____ <u>Merganser Bay Resort Inc</u> ;</p> <p>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</p>	

Section 5. Environmental Monitoring

Attach text or document files explaining the monitoring regimen. Use your "return" button on your keyboard after each line. It is suggested that all document be converted to PDF *before* inserting into the PDF version of the assessment report. Include actions required, monitoring schedule, communications plan, and requirement for a post development report.

A Qualified Environmental Professional (QEP) will be retained as project environmental monitor (EM) by the proponent. The focus of monitoring will be on observing that there is no transportation of sediment-laden water to the lake because of loss of vegetation and movement of soil. In addition, monitoring will include requiring implementation of the Riparian Enhancement Plan as described earlier (Section 2).

The EM will visit the site during construction and then conduct a final **construction** site visit when construction is complete in order to document the effectiveness of described SPEA protection measures. **The riparian enhancement planting will also be documented at this time and will be monitored for a period of three years. Any plantings that do not survive the first three years will be replaced to achieve a survival rate of 80%. A construction and riparian planting monitoring program is presented in Table 1 below.**

The post-development/construction report will summarize the degree of compliance with the above measures and document the effectiveness of SPEA protection measures. The QEP will post the report on the RAR database as required under RAR.

Table 1: General construction and riparian planting monitoring program.

Year	Activity
2009	At least two site visits during retaining wall installation and utility works (and other visits as needed)
2010	Final construction site visit and document compliance with the riparian enhancement planting
2011	Year 1 - riparian enhancement monitoring
2012	Year 2 - riparian enhancement monitoring
2013	Year 3 - riparian enhancement monitoring and posting of completion report on the RAR notification database

Section 6. Photos**Photos**

Photograph 1 A view of the Merganser Bay Resort property facing north west from the Sugar Lake Road bridge.



Photograph 2 A view of the silt being transported from the Sugar Lake Road culvert to Sugar Lake.



FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

<p>Photograph 3</p>	<p>A view of the vegetation retained on the southern tip of the property.</p> 
<p>Photograph 4</p>	<p>A view of the work site and removed riparian vegetation along the Ministry of Transportation Road right-of-way.</p> 

Section 7. Professional Opinion

Assessment Report Professional Opinion on the Development Proposal's riparian area.

Date

December 23 2008 Amended: January 15 2009

1. I/We **Brenda M. Miskimmin, Ph.D., R.P.Bio.**

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 Merganser Bay Resort Inc., 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 as described to me by the developer and my/our assessment is set out in this Assessment Report; and
- d) In carrying out my/our assessment of the development proposal as described to me, and 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.

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

Riparian Areas Regulation: Assessment Report

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

Date 30 October 2006

I. Primary QEP Information

First Name	Brenda	M
Last Name	Miskimmin	
Designation	R.P.Bio.	Summit Environmental Consultants Ltd.
Registration #	1845	bm@summit-environmental.com
Address	17A – 100 Kalamalka Lake Road	
City	Vernon	Postal/Zip V1T 7M3 Phone # 250-545-3674
Prov/state	BC	Country Canada

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

First Name		Middle Name
Last Name		
Designation		Company
Registration #		Email
Address		
City	Postal/Zip	Phone #
Prov/state	Country	

III. Developer Information

First Name	Monty	Middle Name
Last Name	Willis	
Company	Kokanee Lodge and Resort	
Phone #	250-547-6517	Email S22
Address	1681 Sugar Lake Road	
City	Lumby	Postal/Zip V0E 2G2
Prov/state	BC	Country Canada

IV. Development Information

Development Type	Utility/service corridor to existing cabins and RV sites		
Area of Development (ha)	0.021	Riparian Length (m)	188
Lot Area (ha)	2.42	Nature of Development	Re-development
Proposed Start Date	1 April 2007	Proposed End Date	15 May 2007

V. Location of Proposed Development

Street Address (or nearest town)	1681 Sugar Lake Road		
Local Government	North Okanagan Regional District Steve Noakes 250-550-3737	City	Lumby
Stream Name	Sugar Lake		
Legal Description (PID)	026-301-288	Region	(North) Okanagan
Stream/River Type	Lake	DFO Area	BC Interior
Watershed Code	128-835500		
Latitude	50°	21'	20"
Longitude	118°	32'	22"

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

Table of Contents for Assessment Report

Number	Page
1. Description of Fisheries Resources Values	3
2. Results of Riparian Assessment (SPEA width)	6
3. Site Plan	8
4. Measures to Protect and Maintain the SPEA (detailed methodology only).	
1. Danger Trees.....	9
2. Windthrow.....	9
3. Slope Stability.....	9
4. Protection of Trees.....	9
5. Encroachment	9
6. Sediment and Erosion Control.....	10
7. Floodplain.....	10
8. Stormwater Management.....	10
5. Environmental Monitoring	11
6. Photos	11
7. Assessment Report Professional Opinion	13

Section 1. Description of Fisheries Resources Values and a Description of the Development proposal

(Provide as a minimum: Species present, type of fish habitat present, description of current riparian vegetation condition, connectivity to downstream habitats, nature of development, specific activities proposed, timelines)

Fish Habitat

Sugar Lake has an area of 2080 ha and a shoreline length of 36 km. Most of the watershed is undisturbed with the exception of logging, a few cabins, and Kokanee Lodge and Resort. Although Sugar Lake was once a natural lake, the construction of the Sugar Lake Dam in 1928 significantly expanded the area of the lake (reservoir), especially when it is at full pool. Prior to dam construction, the outlet of Sugar Lake was located about 0.9 km upstream of its current location and the Shuswap River flowed past the current site of the property. During the winter and spring, when the reservoir is drawn down by BC Hydro, the water in front of the lodge again resembles the river, and the water is several metres lower than at full pool. The Shuswap River both upstream and downstream of Sugar Lake are connected, although the Dam prevents fish migration upstream from the Shuswap River to Sugar Lake.

Fish Species Present

All waterbodies addressed in this assessment are considered fish-bearing or potentially fish-bearing. Thirteen fish species have been documented in Sugar Lake (see Table 1) of which four are salmonid species. The salmonids include bull trout, cutthroat trout, rainbow trout and kokanee.

Table 1 Fish species known to be present in Sugar Lake and Shuswap River.

Species	Sugar Lake	Shuswap River from Wilsey Dam to Sugar Lake dam	Shuswap River – entire river
Bridgelip sucker			✓
Burbot	✓		
Bull trout		✓	✓
Chinook salmon		✓*	✓
Coho salmon			✓
Cutthroat trout	✓	✓	✓
Dolly varden	✓		✓
Dolly varden (anadromous)			✓
Kokanee	✓	✓	✓
Largescale sucker	✓	✓	✓
Leopard dace		✓**	
Longnose sucker	✓		
Longnose dace		✓	✓
Mountain whitefish	✓	✓	✓
Northern pikeminnow	✓	✓	✓
Peamouth chub	✓		✓
Pink salmon			✓
Prickly sculpin		✓	✓
Rainbow trout	✓	✓	✓
Redside shiner	✓	✓	✓

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

Sculpin (general)			✓
Slimy sculpin			✓
Sockeye salmon			✓
Sucker (general)	✓		✓
Whitefish (general)	✓		

Source: FishWizard database (accessed May 23, 2006).

* Historic, introduced. ** Unconfirmed.

Interior dolly varden are now considered to be bull trout.

Vegetation

The site is located within the Interior Cedar Hemlock biogeoclimatic zone, moist-warm subzone, Columbia-Shuswap variant (ICHmw2). Riparian vegetation along the western shoreline of Sugar Lake includes native species such as western red cedar, black cottonwood, interior Douglas fir, western hemlock, as well as non-native weed species (Table 2).

Riparian vegetation on the property is relatively sparse compared to undeveloped areas and contains all of the tree species listed above plus a variety of shrubs, grasses, weeds and a non-native apple tree. A gravel road extends the length of the property with shoreline campsites, two cabins and a beach situated east of the road (between the road and the lake). The width of riparian vegetation (i.e., trees and shrubs along the shoreline) on the property is variable (0 m to 25 m), averaging 10 m. Black cottonwoods line the shore along the southern third of the property. There are stands of mature cedar in the southern and central riparian zones of the property. Photographs 1 through 4 indicate the existing shoreline development and vegetation.

Table 2. The Structure of Mixed Species Stands in the Interior Cedar Hemlock biogeoclimatic zone, moist-warm subzone, Columbia-Shuswap variant ICHmw found along Sugar Lake Road (west side of Sugar Lake).

Tree Species Scientific Name	Common Name	Sugar Lake
<i>Abies lasiocarpa</i>	Subalpine Fir	✓
<i>Betula papyrifera</i>	Paper Birch	✓
<i>Betula occidentalis</i>	Water Birch	
<i>Larix occidentalis</i>	Western Larch	
<i>Picea glauca x engelmannii</i>	Hybrid White Spruce	✓
<i>Pinus contorta</i> var. <i>latifolia</i>	Lodgepole Pine	✓
<i>Pinus monticola</i>	Western White Pine	✓
<i>Populus trichocarpa</i>	Black Cottonwood	✓
<i>Populus tremuloides</i>	Trembling Aspen	✓
<i>Pseudotsuga menziesii</i> var. <i>glauca</i>	Interior Douglas-fir	✓
<i>Salix</i> sp.	Willow	
<i>Thuja plicata</i>	Western Redcedar	✓
<i>Tsuga heterophylla</i>	Western Hemlock	✓
<i>Taxus brevifolia</i>	Western Yew	

Development Proposal Details

Kokanee Lodge and Resort has been at this location at the south end of Sugar Lake for about 40 years. Specifically, it is located on the southeast shore of Sugar Lake during the summer and fall months, but is more distant from the water's edge during the winter and spring months (due to reduced flows).

The proposed re-development is part of an upgrading plan for the existing cabins and RV sites. The proposed re-development is limited to an area of 0.021 ha (30 m X 1 m trenches X 7 cabin/RV sites) distributed along 188 m of shoreline. The areal value may be cut in half (to 0.0105

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

ha) if development only within the assessed setback is considered. No new structures are proposed for within the calculated setback area.

The proposed re-development plans include:

- extending services (water, sewer, electricity) to 2 existing cabins and 5 existing RV sites along the waterfront; this would involve digging service trenches to each site, temporarily disturbing soils;
- constructing a new cabin (>15 m back),
- removing and landscaping a section of road, and
- other improvements and construction outside the 30 m assessment area.

Minimal vegetation will be disturbed during the utility/service installations and additional landscaping will follow as quickly as possible.

The timeline for the development is over the spring months, if feasible, so that negligible disturbance will be created to fish and fish habitat, and restoration of the trenched areas will occur soon after. During this time period, the water's edge is several metres lower than the full-pool level (July – November only, per BC Hydro controls).

Section 2. Results of Detailed Riparian Assessment

Refer to Chapter 3 of Assessment Methodology

Date: 30 Oct 2006

Description of Water bodies involved (number, type)

Lake, area: 2080 hectares

Stream

Wetland

Lake

Ditch

YES

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		
upstream		
downstream		
Total: minus high /low mean		
	R/P	C/P S/P
Channel Type		

I, _____ (name of qualified environmental professional), 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 _____ (name of developer);

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
			<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b) I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Monty Willis of Kokanee Lodge and Resort</u>;</p> <p>c) I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and</p> <p>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.</p>
Polygon No:	1		Method employed if other than TR
SPVT Type	LC	SH	TR
			X
Polygon No:			Method employed if other than TR
SPVT Type	LC	SH	TR
Polygon No:			Method employed if other than TR
SPVT Type			

Zone of Sensitivity (ZOS) and resultant SPEA

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)	15						
Litter fall and insect drop ZOS (m)	15						
Shade ZOS (m) max	15	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	15	(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)					

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)					

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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


Much of the waterfront is beach, grass and small shrubs, with sparse trees that will remain intact (see photos).



NOTES:

ADAMS, JACOBSON, LOT 1, PLAN KAPPAHNS, DL 2160 & 5306,
CANTON
ENCL JACOBSON, PFF
ZONED "C" (RESIDENTIAL COMMERCIAL)"
SUBMITTED BY JACOB SHORTT BILLS JULY 27, 2006.
FILE NO. 34533

DIMENSIONS SHOWN ARE FOR EASE OF INTERFERING THE
FIELD SURVEY. DIMENSIONS SHOWN ARE NOT INTENDED FOR USE IN
LEGAL DOCUMENTS. FOR USE IN FIELD LAYOUT, WILL BE
DIMENSIONAL COMMERCIAL.

 <p> ENGINEERING, PLANNING & ARCHITECTS 3711 NOTRE DAME DRIVE, WILLOWDALE, ONT. M2H 3B9 PHONE (220) 374-5525 FAX (220) 372-8336 </p>	REV. No. A 2004-08-17
HORST RV RESORT ADDITIONS	DRAWING No. 050083-20-01

Section 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	Not applicable
I, _____ (<i>name of qualified environmental professional</i>), hereby certify that: a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b) I am qualified to carry out this part of the assessment of the development proposal made by the developer _____ (<i>name of developer</i>); 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	
2. Windthrow	Not applicable
I, _____ (<i>name of qualified environmental professional</i>), hereby certify that: a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b) I am qualified to carry out this part of the assessment of the development proposal made by the developer _____ (<i>name of developer</i>); 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	Not applicable
I, _____ (<i>name of qualified environmental professional</i>), hereby certify that: a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b) I am qualified to carry out this part of the assessment of the development proposal made by the developer _____ (<i>name of developer</i>); 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	Not applicable
I, _____ (<i>name of qualified environmental professional</i>), hereby certify that: a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b) I am qualified to carry out this part of the assessment of the development proposal made by the developer _____ (<i>name of developer</i>); 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	Not applicable
I, _____ (<i>name of qualified environmental professional</i>), hereby certify that: a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b) I am qualified to carry out this part of the assessment of the development proposal made by the developer _____ (<i>name of developer</i>); 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	The services including temporary trenches will be installed following "Best Management Practices for Urban and Rural Land Development" and per the EIA/CEMP.
I, <u>Brenda M. Miskimmin</u> (<i>name of qualified environmental professional</i>), hereby certify that: a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; b) I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Monty Willis</u> (<i>name of developer</i>); 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	Not applicable within the riparian area setback.

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

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e. Floodplain Concerns (highly mobile channel)	Not applicable (dam-controlled high water level)
I, _____ (<i>name of qualified environmental professional</i>), hereby certify that: f. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i> ; g. I am qualified to carry out this part of the assessment of the development proposal made by the developer _____ (<i>name of developer</i>); 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	

Photos

#1

View of Kokanee Lodge and Resort taken from the gravel road, facing north. Mature cedars are central, while the wharf, campsites and 2 cabins are along the shore (August 15, 2006).



#2

View of Kokanee Lodge and Resort beach area just south of the wharf, taken from the gravel road, facing southeast (August 15, 2006). Service trench proposed for the back of the cabin shown in the centre of the photo.



Photos

- #3 View of RV site to be re-developed more than 15 m from the HWM, and a gravel road that will be decommissioned and re-vegetated (15 August 2006).



- #4 View facing north indicating two RV sites and one of the cabins proposed to have service trenches on the opposite side of them to the lake (15 August 2006).



Section 5. Environmental Monitoring

Attach text or document files explaining the monitoring regimen Use your "return" button on your keyboard after each line. It is suggested that all document be converted to PDF *before* inserting into the PDF version of the assessment report. Include actions required, monitoring schedule, communications plan, and requirement for a post development report.

A component of the overall development is the use of a Construction Environmental Monitoring Plan. Disturbance will be minimized by completing all excavations and installations when water levels are lowest and distant the normal full-pool of the reservoir. In addition, an environmental monitor will be present during construction to ensure that potential impacts from service installation are negligible.

Potential sediment introductions to Sugar Lake from construction will be mitigated by construction timing (during winter low flows) and the use of silt fences. Any short-term potential impacts resulting from construction (including sedimentation, turbidity) will be avoided or mitigated by the application of industry best practice techniques.

As part of a full environmental assessment for development outside of the 30 m riparian assessment area, monitoring of water quality, benthic invertebrates and periphyton is proposed for the south end of Sugar Lake and downstream Shuswap River. Pre-construction monitoring was completed during the summer of 2006. An annual post-development report is a component of the assessment. A copy of the annual report may be provided to MOE-RAR upon request. This EIA is currently under review with MOE.

These mitigation techniques combined with ongoing water quality monitoring will ensure that the proposed project does not significantly impact water quality and fisheries in Sugar Lake.

Section 7. Professional Opinion

Assessment Report Professional Opinion on the Development Proposal's riparian area.

Date 30 October 2006

1. I/We Brenda M. Miskimmin, Ph.D., R.P.Bio.

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 Monty Willis (name of developer), 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 as described to me by the developer and my/our assessment is set out in this Assessment Report; and
- d) In carrying out my/our assessment of the development proposal as described to me, and 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 that due to legal and liability concerns, the North Okanagan Regional District currently does not provide flex or hardship letters under any circumstances (Steve Noakes, NORD Planner, pers.comm. 250-550-3737).

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

Riparian Areas Regulation: Assessment Report

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

Date 30 October 2006

I. Primary QEP Information

First Name	Brenda	M
Last Name	Miskimmin	
Designation	R.P.Bio.	Summit Environmental Consultants Ltd.
Registration #	1845	bm@summit-environmental.com
Address	17A – 100 Kalamalka Lake Road	
City	Vernon	Postal/Zip V1T 7M3 Phone # 250-545-3674
Prov/state	BC	Country Canada

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

First Name		Middle Name
Last Name		
Designation		Company
Registration #		Email
Address		
City	Postal/Zip	Phone #
Prov/state	Country	

III. Developer Information

First Name	Monty	Middle Name
Last Name	Willis	
Company	Kokanee Lodge and Resort	
Phone #	250-547-6517	Email S22
Address	1681 Sugar Lake Road	
City	Lumby	Postal/Zip V0E 2G2
Prov/state	BC	Country Canada

IV. Development Information

Development Type	Utility/service corridor to existing cabins and RV sites		
Area of Development (ha)	0.021	Riparian Length (m)	188
Lot Area (ha)	2.42	Nature of Development	Re-development
Proposed Start Date	1 April 2007	Proposed End Date	15 May 2007

V. Location of Proposed Development

Street Address (or nearest town)	1681 Sugar Lake Road		
Local Government	North Okanagan Regional District Steve Noakes 250-550-3737 9848 Aberdeen Road, Coldstream, BC V1B 2K9		City N/A
Stream Name	Sugar Lake		
Legal Description (PID)	026-301-288	Region	(North) Okanagan
Stream/River Type	Lake	DFO Area	BC Interior
Watershed Code	128-835500		
Latitude	50°	21'	20"
Longitude	118°	32'	22"

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

Table of Contents for Assessment Report

Number	Page
1. Description of Fisheries Resources Values	3
2. Results of Riparian Assessment (SPEA width)	6
3. Site Plan	8
4. Measures to Protect and Maintain the SPEA (detailed methodology only).	
1. Danger Trees.....	9
2. Windthrow.....	9
3. Slope Stability.....	9
4. Protection of Trees.....	9
5. Encroachment	9
6. Sediment and Erosion Control.....	10
7. Floodplain.....	10
8. Stormwater Management.....	10
5. Environmental Monitoring	11
6. Photos	11
7. Assessment Report Professional Opinion	13

Section 1. Description of Fisheries Resources Values and a Description of the Development proposal

(Provide as a minimum: Species present, type of fish habitat present, description of current riparian vegetation condition, connectivity to downstream habitats, nature of development, specific activities proposed, timelines)

Fish Habitat

Sugar Lake has an area of 2080 ha and a shoreline length of 36 km. Most of the watershed is undisturbed with the exception of logging, a few cabins, and Kokanee Lodge and Resort. Although Sugar Lake was once a natural lake, the construction of the Sugar Lake Dam in 1928 significantly expanded the area of the lake (reservoir), especially when it is at full pool. Prior to dam construction, the outlet of Sugar Lake was located about 0.9 km upstream of its current location and the Shuswap River flowed past the current site of the property. During the winter and spring, when the reservoir is drawn down by BC Hydro, the water in front of the lodge again resembles the river, and the water is several metres lower than at full pool. The Shuswap River both upstream and downstream of Sugar Lake are connected, although the Dam prevents fish migration upstream from the Shuswap River to Sugar Lake.

Fish Species Present

All waterbodies addressed in this assessment are considered fish-bearing or potentially fish-bearing. Thirteen fish species have been documented in Sugar Lake (see Table 1) of which four are salmonid species. The salmonids include bull trout, cutthroat trout, rainbow trout and kokanee.

Table 1 Fish species known to be present in Sugar Lake and Shuswap River.

Species	Sugar Lake	Shuswap River from Wilsey Dam to Sugar Lake dam	Shuswap River – entire river
Bridgelip sucker			✓
Burbot	✓		
Bull trout		✓	✓
Chinook salmon		✓*	✓
Coho salmon			✓
Cutthroat trout	✓	✓	✓
Dolly varden	✓		✓
Dolly varden (anadromous)			✓
Kokanee	✓	✓	✓
Largescale sucker	✓	✓	✓
Leopard dace		✓**	
Longnose sucker	✓		
Longnose dace		✓	✓
Mountain whitefish	✓	✓	✓
Northern pikeminnow	✓	✓	✓
Peamouth chub	✓		✓
Pink salmon			✓
Prickly sculpin		✓	✓
Rainbow trout	✓	✓	✓
Redside shiner	✓	✓	✓

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

Sculpin (general)			✓
Slimy sculpin			✓
Sockeye salmon			✓
Sucker (general)	✓		✓
Whitefish (general)	✓		

Source: FishWizard database (accessed May 23, 2006).

* Historic, introduced. ** Unconfirmed.

Interior dolly varden are now considered to be bull trout.

Vegetation

The site is located within the Interior Cedar Hemlock biogeoclimatic zone, moist-warm subzone, Columbia-Shuswap variant (ICHmw2). Riparian vegetation along the western shoreline of Sugar Lake includes native species such as western red cedar, black cottonwood, interior Douglas fir, western hemlock, as well as non-native weed species (Table 2).

Riparian vegetation on the property is relatively sparse compared to undeveloped areas and contains all of the tree species listed above plus a variety of shrubs, grasses, weeds and a non-native apple tree. A gravel road extends the length of the property with shoreline campsites, two cabins and a beach situated east of the road (between the road and the lake). The width of riparian vegetation (i.e., trees and shrubs along the shoreline) on the property is variable (0 m to 25 m), averaging 10 m. Black cottonwoods line the shore along the southern third of the property. There are stands of mature cedar in the southern and central riparian zones of the property. Photographs 1 through 4 indicate the existing shoreline development and vegetation.

Table 2. The Structure of Mixed Species Stands in the Interior Cedar Hemlock biogeoclimatic zone, moist-warm subzone, Columbia-Shuswap variant ICHmw found along Sugar Lake Road (west side of Sugar Lake).

Tree Species Scientific Name	Common Name	Sugar Lake
<i>Abies lasiocarpa</i>	Subalpine Fir	✓
<i>Betula papyrifera</i>	Paper Birch	✓
<i>Betula occidentalis</i>	Water Birch	
<i>Larix occidentalis</i>	Western Larch	
<i>Picea glauca x engelmannii</i>	Hybrid White Spruce	✓
<i>Pinus contorta</i> var. <i>latifolia</i>	Lodgepole Pine	✓
<i>Pinus monticola</i>	Western White Pine	✓
<i>Populus trichocarpa</i>	Black Cottonwood	✓
<i>Populus tremuloides</i>	Trembling Aspen	✓
<i>Pseudotsuga menziesii</i> var. <i>glauca</i>	Interior Douglas-fir	✓
<i>Salix</i> sp.	Willow	
<i>Thuja plicata</i>	Western Redcedar	✓
<i>Tsuga heterophylla</i>	Western Hemlock	✓
<i>Taxus brevifolia</i>	Western Yew	

Development Proposal Details

Kokanee Lodge and Resort has been at this location at the south end of Sugar Lake for about 40 years. Specifically, it is located on the southeast shore of Sugar Lake during the summer and fall months, but is more distant from the water's edge during the winter and spring months (due to reduced flows).

The proposed re-development is part of an upgrading plan for the existing cabins and RV sites. The proposed re-development is limited to an area of 0.021 ha (30 m X 1 m trenches X 7 cabin/RV sites) distributed along 188 m of shoreline. The areal value may be cut in half (to 0.0105

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Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

ha) if development only within the assessed setback is considered. No new structures are proposed for within the calculated setback area.

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- extending services (water, sewer, electricity) to 2 existing cabins and 5 existing RV sites along the waterfront; this would involve digging service trenches to each site, temporarily disturbing soils;
- constructing a new cabin (>15 m back),
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- other improvements and construction outside the 30 m assessment area.

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Section 2. Results of Detailed Riparian Assessment

Refer to Chapter 3 of Assessment Methodology

Date: 30 Oct 2006

Description of Water bodies involved (number, type)

Lake, area: 2080 hectares

Stream	
Wetland	
Lake	YES
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		
upstream		
downstream		
Total: minus high /low mean		
	R/P	C/P S/P
Channel Type		

I, Brenda M. Miskimmin, hereby certify that:

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

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

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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
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Polygon No:	1		Method employed if other than TR
SPVT Type	LC SH TR		
Polygon No:			Method employed if other than TR
SPVT Type	LC SH TR		
Polygon No:			Method employed if other than TR
SPVT Type			

Zone of Sensitivity (ZOS) and resultant SPEA

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)	15						
Litter fall and insect drop ZOS (m)	15						
Shade ZOS (m) max	15						
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	15	(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						
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Shade ZOS (m) max							
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Litter fall and insect drop ZOS (m)							
Shade ZOS (m) max							
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SPEA maximum		(For ditch use table3-7)					

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Comments

Much of the waterfront is beach, grass and small shrubs, with sparse trees that will remain intact (see photos).

Section 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	Not applicable as there are no Danger Trees on site.
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b) I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Monty Willis</u> ;</p> <p>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</p>	
2. Windthrow	Not applicable as no trees will be removed for the project.
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b) I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Monty Willis</u> ;</p> <p>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</p>	
d. Slope Stability	Not applicable. Site is very shallow-sloped and will be minimally disturbed for the temporary trenches only. See photos.
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b) I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Monty Willis</u> ;</p> <p>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</p>	
e. Protection of Trees	Developer will not: a) trench through root zones, b) pave near trees, c) change the ground level around trees, d) will use best management practices to prevent contamination around trees. In general, disturbance will be negligible to existing trees.
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b) I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Monty Willis</u> ;</p> <p>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</p>	
d. Encroachment	This site has a ~40 year history as an existing campground, beach and resort property. The riparian area as it exists will not change significantly. See photos.
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a) I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b) I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Monty Willis</u> ;</p> <p>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</p>	

FORM 1

Riparian Areas Regulation - Qualified Environmental Professional - Assessment Report

e. Sediment and Erosion Control	The services including temporary trenches will be installed following "Best Management Practices for Urban and Rural Land Development" and per the EIA/CEMP.
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Monty Willis</u>;</p> <p>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</p>	
d. Stormwater Management	Not applicable as there are no new impervious surfaces planned for the riparian area.
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Monty Willis</u>;</p> <p>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</p>	
e. Floodplain Concerns (highly mobile channel)	Not applicable because there is a BC Hydro dam-controlled high water level that is never exceeded.
<p>I, <u>Brenda M. Miskimmin</u>, hereby certify that:</p> <p>f. I am a qualified environmental professional, as defined in the Riparian Areas Regulation made under the <i>Fish Protection Act</i>;</p> <p>g. I am qualified to carry out this part of the assessment of the development proposal made by the developer <u>Monty Willis</u>;</p> <p>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</p>	

Photos

#1

View of Kokanee Lodge and Resort taken from the gravel road, facing north. Mature cedars are central, while the wharf, campsites and 2 cabins are along the shore (August 15, 2006).



#2

View of Kokanee Lodge and Resort beach area just south of the wharf, taken from the gravel road, facing southeast (August 15, 2006). Service trench proposed for the back of the cabin shown in the centre of the photo.



Photos

- #3 View of RV site to be re-developed more than 15 m from the HWM, and a gravel road that will be decommissioned and re-vegetated (15 August 2006).



- #4 View facing north indicating two RV sites and one of the cabins proposed to have service trenches on the opposite side of them to the lake (15 August 2006).



Section 5. Environmental Monitoring

Attach text or document files explaining the monitoring regimen Use your "return" button on your keyboard after each line. It is suggested that all document be converted to PDF *before* inserting into the PDF version of the assessment report. Include actions required, monitoring schedule, communications plan, and requirement for a post development report.

A component of the overall development is the use of a Construction Environmental Monitoring Plan. Disturbance will be minimized by completing all excavations and installations when water levels are lowest and distant the normal full-pool of the reservoir. In addition, an environmental monitor will be present during construction to ensure that potential impacts from service installation are negligible.

Potential sediment introductions to Sugar Lake from construction will be mitigated by construction timing (during winter low flows) and the use of silt fences. Any short-term potential impacts resulting from construction (including sedimentation, turbidity) will be avoided or mitigated by the application of industry best practice techniques.

As part of a full environmental assessment for development outside of the 30 m riparian assessment area, monitoring of water quality, benthic invertebrates and periphyton is proposed for the south end of Sugar Lake and downstream Shuswap River. Pre-construction monitoring was completed during the summer of 2006. An annual post-development report is a component of the assessment. A copy of the annual report may be provided to MOE-RAR upon request. This EIA is currently under review with MOE.

These mitigation techniques combined with ongoing water quality monitoring will ensure that the proposed project does not significantly impact water quality and fisheries in Sugar Lake.

Section 7. Professional Opinion

Assessment Report Professional Opinion on the Development Proposal's riparian area.

Date 30 October 2006

1. I/We Brenda M. Miskimmin, Ph.D., R.P.Bio.

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 Monty Willis (name of developer), 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 as described to me by the developer and my/our assessment is set out in this Assessment Report; and
- d) In carrying out my/our assessment of the development proposal as described to me, and 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 that due to legal and liability concerns, the North Okanagan Regional District currently does not provide flex or hardship letters under any circumstances (Steve Noakes, NORD Planner, pers.comm. 250-550-3737).