NAITO ENVIRONMENTAL

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February 27, 2013

Our File: **400-67-01**

Mr. Wade Cantalope
61 Beachwood Road
Regional District of Central Okanagan, BC V1H 2E4

Re: **Addition to Private Dock at 61 Beachwood Road, RDCO, BC**
Lot 9, Plan 18400, DL 3795, ODYD - Environmental Assessment

Dear Mr. Cantalope:

The following letter report provides an environmental assessment of the proposed addition to your private dock at 61 Beachwood Road in the Regional District of Central Okanagan (RDCO) on the west side of Okanagan Lake near Fintry Landing.

BACKGROUND

The owners of 61 Beachwood Road on the west side of Okanagan Lake have an existing dock that they would like to extend to deeper water for improved boat access. The following environmental review of the proposed project has been undertaken to meet the need for QP assessment and to ensure that environmental values are identified and protected.

PROPOSED WORKS

The project site is located on the west side of Okanagan Lake approximately 20 km southwest of Vernon, BC (Figure 1). The existing dock (Photo 1, Figure 2, Figure 3) is 19.5 m long × 3 m wide for a total area of 58.5 m^2. The dock addition will consist of extending the walkway by an additional 4.5 m and adding a 3 m wide × 8 m long el, supported on six piles, to the south (Figure 3). The dock area to be added, including a small angle between the walkway and el, will be approximately 37 m^2. Water depth under the dock addition will be greater than 0.8 m below the low water mark of 341.34 m, meeting the depth requirement where new dock construction can be wider than 1.5 m. An existing boat lift on the north side of the existing dock will be moved out along the new section of walkway, while an existing jet ski lift closer to shore on the north side of the dock will be moved out to the present boat lift location (Figure 3).

The dock addition will be conducted primarily from a floating barge and/or boat. However, limited shore access is available through the landscaped yard.

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METHODS

I conducted site investigations on November 14, 2012 by wading near shore, walking on the existing dock, and using a float tube to access deeper water while looking into the water with polarized glasses. The primary investigations consisted of measuring a depth profile, assessing suitability of the substrate for shore-spawning by kokanee (*Oncorhynchus nerka*) and mountain whitefish (*Prosopium williamsoni*) based on substrate type and water depth, and conducting a search for specimens or shells of the red-listed Rocky Mountain ridged mussel (*Gonidea angulata*). Measurements were taken with a 50 m fiberglass tape, 2.4 m depth stick, and weighted rope marked at 0.5 m intervals. Water quality characteristics were measured with a Hanna Instruments HI98129 combo tester.

The BC Conservation Data Centre website was checked for any mapped occurrences of species or ecosystems at risk in the project vicinity.

In addition to this assessment report, a QP (Qualified Professional) Checklist for Foreshore Works has been completed as per the Okanagan Region Large Lakes Foreshore Protocol (OLLP)[1] and is attached as Appendix 1.

HABITAT CONDITIONS

Okanagan Lake water level[2] on the survey date of November 14, 2012 was around 341.792 m, 1.2 m below the extreme HWM of 343.0 m and about 0.45 m above the low water level of 341.34 m. Water quality characteristics measured near the shore at 1312 PST were as follows: temperature 9.6° C; conductivity 293 µS/cm; and total dissolved solids 146 ppm. Water clarity was high, with a secchi depth (25 cm disk) of around 6 m.

The lake bottom at the dock location had a relatively constant slope of 9% out to 50 m from high water mark (HWM) (Table 1) (Figure 3 Section View). Substrate was a predominantly 8-15 cm cobble (Photo 2). Carpet to suppress aquatic plant growth covered the bottom around 19-20 m from HWM, while a mix of cobble, boulder, and sand with suspected Eurasian milfoil (*Myriophyllum spicatum*) were observed around 30 m out.

The site appears to have low to nil spawning potential for kokanee and whitefish because these shore spawning fish require rocky substrate with interstitial spaces to protect their eggs and newly-hatched offspring from predators and physical damage from waves. The cobble substrate at the dock site is either bedded on or embedded in fine gravel and sand, affording no such spaces for eggs to settle.

[1] Okanagan Large Lakes Foreshore Protocol – Okanagan Lake North Map File.
[2] Environment Canada Real-Time Hydrometric Data for Station 08NM083 Okanagan Lake at Kelowna. http://www.wateroffice.ec.gc.ca/text_search/search_e.html?search_by=p&region=BC. Accessed on Nov 14, 2012.

Table 1. Depths and substrate types along existing dock at 61 Beachwood Road on Okanagan Lake near Fintry, BC.

Distance (m)	Depth (m)	Substrate	Comments
0	na		estimated high water mark 343.0 m
5.7	0.00		wetted edge 341.84 m elevation
7.0	0.15	cobble (8-10 cm)	embedded in fine gravel and sand
10	0.30	cobble (8-15 cm)	embedded in gravel
15	0.65	cobble (10-25 cm)	
20	1.53	carpet	
25	2.15	cobble, boulder, sand	
30	2.60	sand	suspected milfoil
35	3.00		
40	3.48		
45	3.92		
50	4.40		

The shoreline at the dock site is a yellow zone (moderate value habitat) under the OLLP (Figure 4) based on historic kokanee sightings. There is a black zone (critical habitat) starting approximately 1.8 k south of the dock (Figure 4). Adjacent docks are located approximately 30 m north (Photo 3) and 30 m south (Photo 4).

The subject property lies within Segment 185 on Mapsheet 47 of the Okanagan Lake Foreshore Inventory and Mapping (FIM)[3]. Foreshore inventory data for this segment are as follows:

Shore Type/Land Use	Gravel/Single Family
Level of Impact	High (>40%)
Habitat Index Rating	Moderate
Wildlife/Plant	No grebe or rare plants
SEI	0% core, 0% corridor, 30% other, 0% buffer, 70% N/A
Fisheries Information	no staging, no migration, no salmon spawning stream, no mussel presence
Juvenile Rearing	Moderate
Kokanee Spawning	0% black zone, 0% red zone, 26% yellow zone, 74% no colour

There was very little riparian vegetation in the vicinity of the proposed dock, with the landscaped yard consisting of rock, gravel, and synthetic turf (Photo 5). A few ornamental shrubs were present in rock terraces further back from the water.

There are no mapped occurrences of elements tracked by the Conservation Data Centre[4] in the vicinity of the dock to be repaired, except for the reported detection of a western screech owl

[3] Foreshore Inventory and Mapping/Aquatic Habitat Index. Okanagan Lake: A compilation of North, South, and Central Okanagan Lake. Prepared for Okanagan Collaborative Conservation Program by Ecoscape Environmental Consultants Ltd., Kelowna, BC. February 2011.

[4] BC Conservation Data Centre Internet Mapping Service http://www.env.gov.bc.ca/atrisk/ims.htm. Accessed February 26, 2013.

(*Megascops kennicottii macfarlanei*) in the vicinity of Shalal Road approximately 5 km south. This does not mean that no sensitive species or ecosystems are present, only that none are presently recorded in the database. However, given the small project size and the high level of previous disturbance/development along the shore, none are expected to be present or affected. No specimens or shells of the red-listed Rocky Mountain Ridged Mussel (*Gonidea angulata*) were observed, the dock is located within a no-colour zone for this species under the OLLP, and the shoreline segment is negative for mussel presence in FIM.

IMPACT ASSESSMENT

A dock installation is considered a high risk activity in the OLLP within yellow zones. However, the dock site appears to have low to nil shore spawning potential and the fisheries impact will be minimal because the dock addition will only involve installation of six new piles which will be installed beyond (deeper than) the depth at which shore spawning would occur. No critical or sensitive lake habitat was detected in the vicinity of the proposed dock, and no species at risk are known to occur at or near the project site. The shoreline segment is rated only moderate for juvenile fish rearing and negative for fish staging or migration in FIM. Standard mitigation measures will be required as described in the next section.

IMPACT MITIGATION PLAN

The following impact mitigation plan specifies requirements relating to environmental monitoring and construction methods.

Environmental Monitoring

As per relevant Best Management Practices[5], environmental monitoring should be conducted full-time at startup. However, due to the minimal disturbance caused by pile driving, and the absence of sensitive environmental features at the site, further monitoring is only recommended if considered necessary by the environmental monitor.

Construction

The dock contractor must employ the following standard impact mitigation measures during construction:

- carry out dock construction during the timing window of June 1 through September 30 for a site beyond 0.5 km from a spawning stream but having some shore spawning potential (i.e., yellow zone);
- keep all machinery and equipment clean and free of leaks, excess oil, and grease;
- prevent any potentially deleterious substances from entering the water, including sawdust or drilling shavings from treated wood;
- minimize disturbance of the lakebed (e.g., do not allow boats or barges to ground on the bottom) to prevent disturbance of aquatic organisms and to avoid creating suspended sediment.

[5] Best Management Practices for Small Boat Moorage on Lakes. BC Ministry of Environment. July 26, 2006.

SUMMARY AND CONCLUSIONS

The proposed work consists of extending an existing dock by 4.5 m and adding a 3 m × 8 m el supported on six untreated fir piles. The dock addition construction will be conducted from a floating barge and boat. No sensitive environmental resources are anticipated to be affected by the construction.

If the proposed dock addition at 61 Beachwood Road is constructed observing applicable best management practices and employing the mitigation measures prescribed in the foregoing report, no harmful alteration, disruption or destruction (HADD) of natural features, functions and conditions that support fish life processes is anticipated to occur.

Please contact me if you have any questions or require further information.

Sincerely yours,
NAITO ENVIRONMENTAL

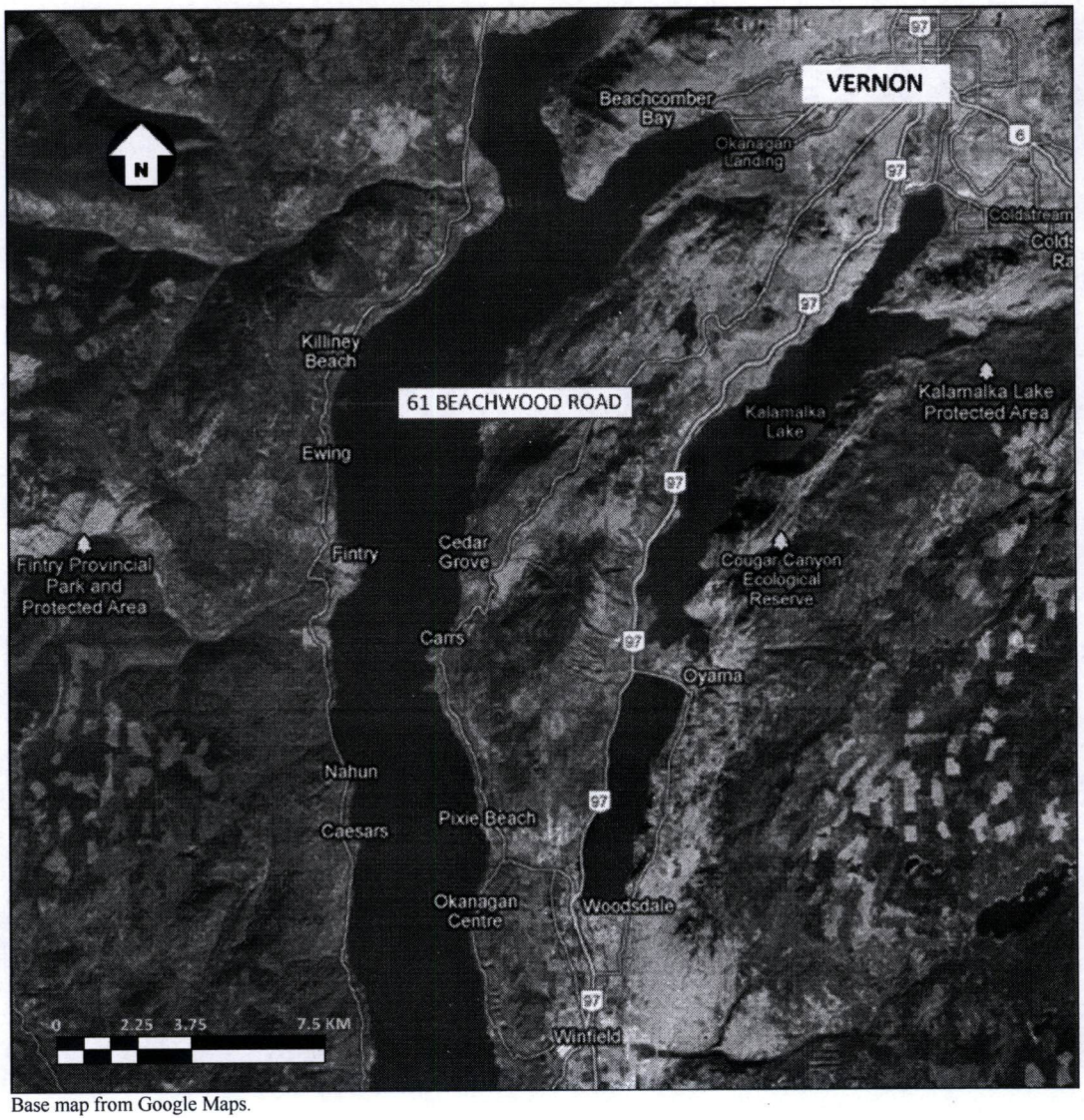
Gerry Naito

Gerry Naito, RPBio
Senior Biologist/Principal

COLLEGE OF APPLIED BIOLOGY
FEB 27/13
Gerry J. Naito
GN
R.P. Bio #708
CAB

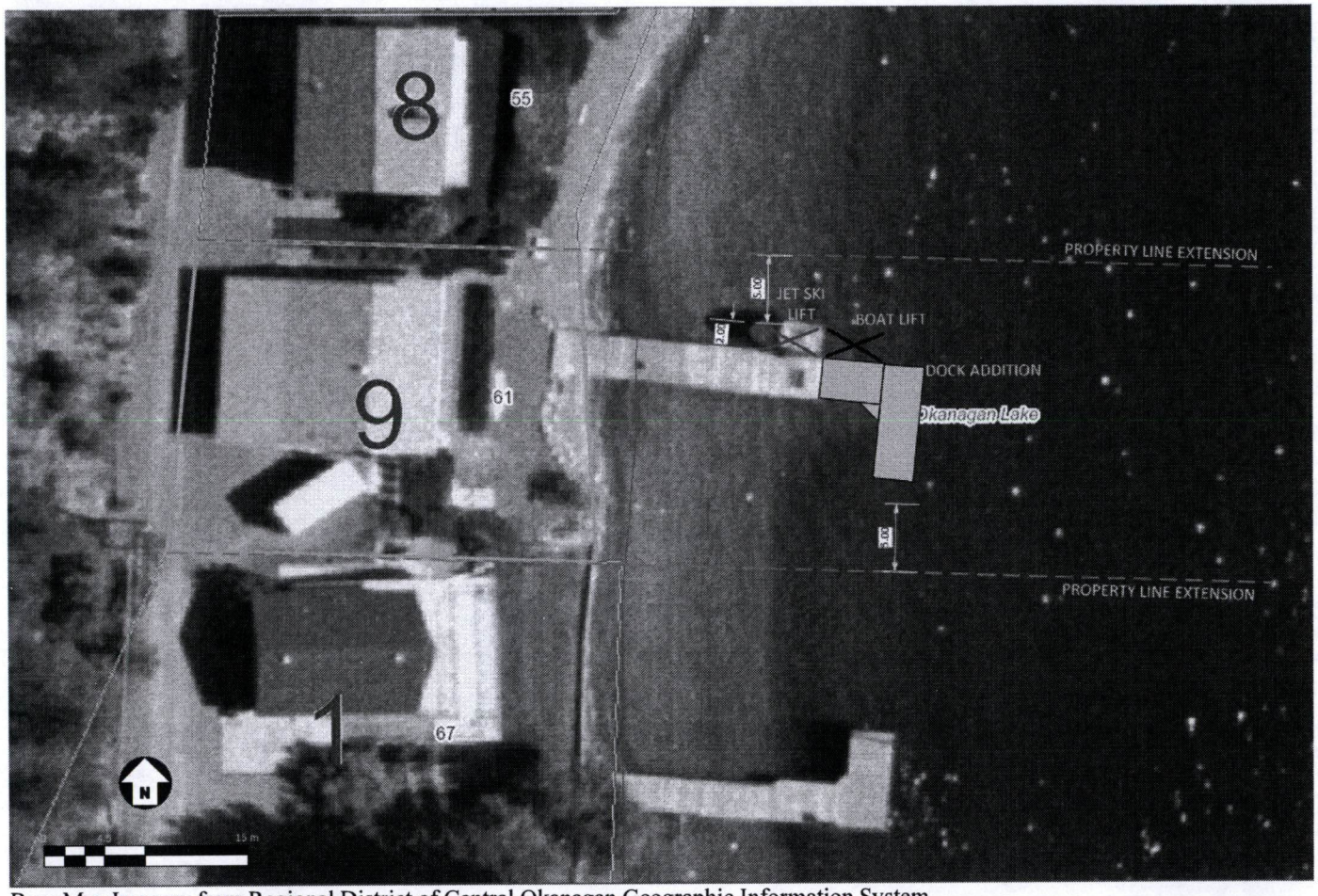
Attachments:

Figure 1. Location of 61 Beachwood Road, RDCO, BC.
Figure 2. Site Plan showing existing dock and proposed addition in relation to property boundaries.
Figure 3. Plan and Section Views of proposed dock addition.
Figure 4. Location of 61 Beachwood Road in relation to habitat colour zones.
Photo Pages (2 pages - 5 photos)
Appendix 1 – QP Checklist for Foreshore Works



Base map from Google Maps.

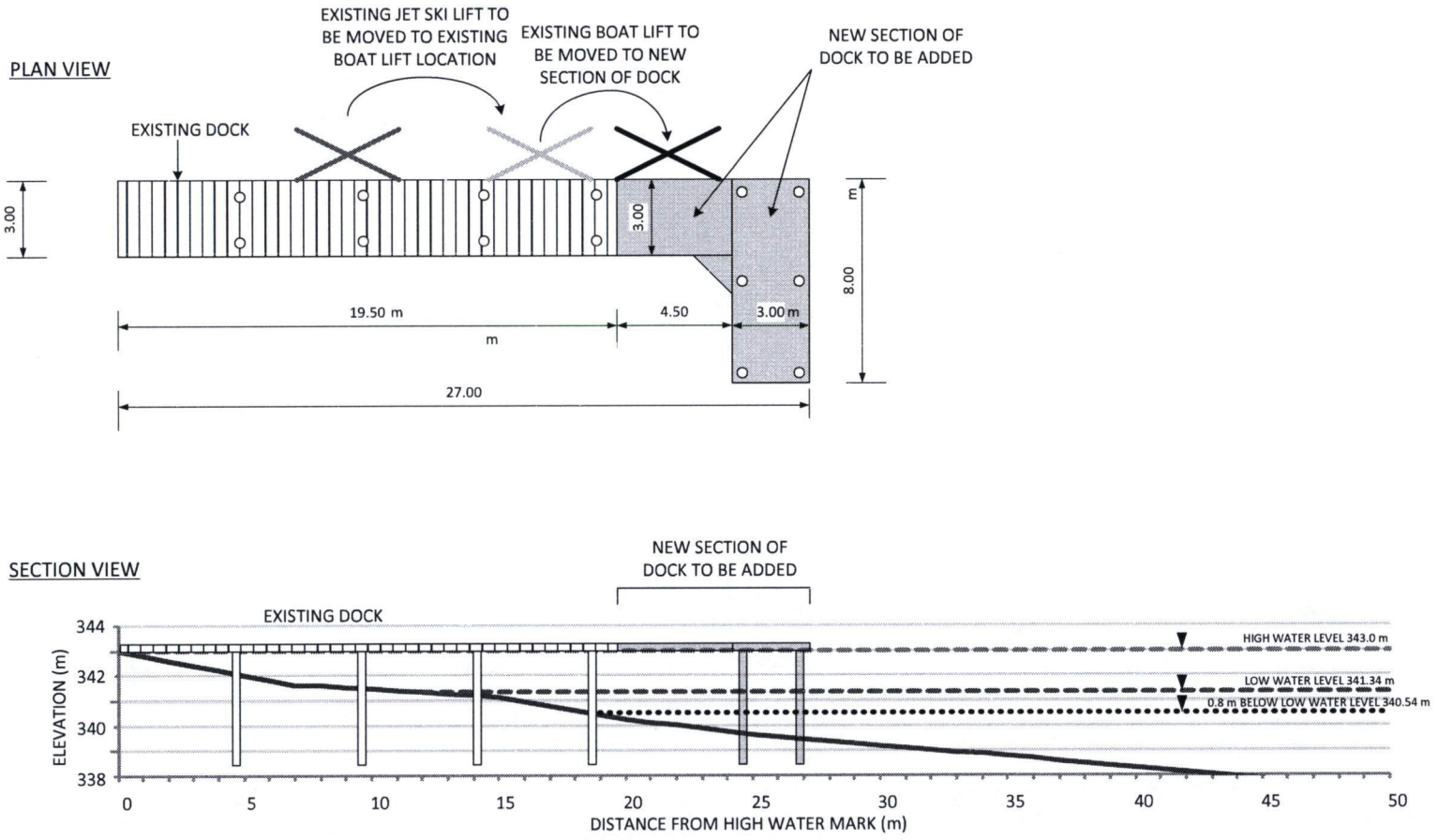
Figure 1. Location of 61 Beachwood Road near Fintry, BC.



Base Map Imagery from Regional District of Central Okanagan Geographic Information System.

Figure 2. Property boundaries of 61 Beachwood Road in relation to proposed dock addition.

FIGURE 2. PLAN AND SECTION VIEWS OF PROPOSED DOCK ADDITION AT 61 BEACHWOOD ROAD, REGIONAL DISTRICT of CENTRAL OKANAGAN, BC.



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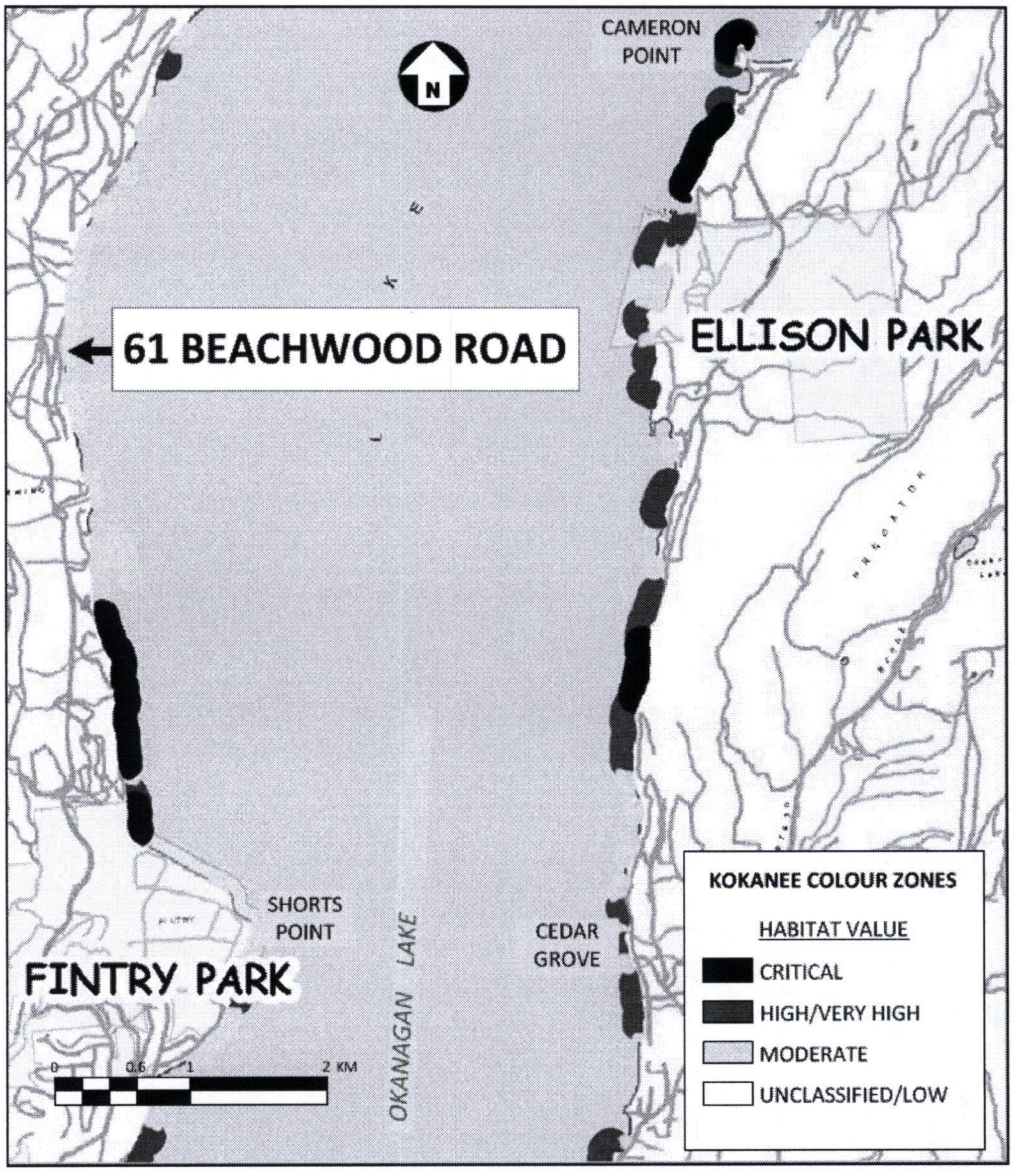


Base map from Okanagan Large Lakes Foreshore Protocol Okanagan Lake Map 4 – Carrs to North End.

Figure 4. Location of proposed dock addition at 61 Beachwood Road in relation to habitat colour zones.

	Photo 1. Existing dock at 61 Beachwood Road near Fintry, BC. Nov 14/12
	Photo 2. Predominantly cobble substrate at dock location. Nov 14/12
	Photo 3. Shoreline looking north from proposed dock. Nov 14/12

	Photo 4. Shoreline looking south from proposed dock. Nov 14/12
	Photo 5. View toward shore showing limited riparian vegetation. Nov 14/12

APPENDIX 1. Qualified Professional Checklist for Foreshore Works - Okanagan LLP

Project Name: **Dock Addition at 61 Beachwood Road, RDCO, BC**
Date: February 27, 2013

NOTE: The items in this checklist apply to the site of works and the surrounding area.

Have you ...		**Yes**	**No**	**N/A**	**Explain**
1.0 SITE SURVEY					
1.1 reviewed existing fish, emergent vegetation, SAR & habitat mapping data, including:	a) Conservation Data Centre (CDC)?	X			only one upland occurrence of SAR 5 km south
	b) local MOE (Ecosystem Staff)?		X		only moderately sensitive area; no impacts anticipated
	c) Foreshore Inventory Mapping?	X			OLLP; FIM
	d) Sensitive Ecosystem Inventory?		X		no upland activity
1.2 conducted any inventories to confirm presence/absence of fish, emergent vegetation and SAR or their habitats on site?		X			no emergent vegetation or SAR present; refer to assessment report
1.3 confirmed environmentally sensitive features or ecosystems on the site? (*only if the upland is within an environmental development permit area*)			X		none present
1.4 evaluated and described local soil and foreshore substrate?		X			refer to assessment report
1.5 assessed potential changes to local shoreline and stream mouth accretion/erosion dynamics? (*only required for marina, infill and erosion protection works*)				X	not a marina, infill, or erosion protection works
2.0 SITE DESIGN & RECOMMENDATIONS					
2.1 applied DFO's principal of 'no net loss'?	a) Redesign?		X		design will not result in loss of fish habitat
	b) Relocate?		X		location will not result in loss of fish habitat
	c) Mitigation?	X			follow BMPs for working in and around water
	d) Compensation?			X	not required
2.2 followed the Habitat Officer's Terms and Conditions?		X			work to be conducted during timing window of June 1-September 30
2.3 followed all BMPs? If not, have you described in the EIA alternatives to BMPs that are being used (pg #)		X			
2.4 included measures to avoid or minimize impacts to aquatic and riparian habitat? (*in relation to existing or potential fish and SAR use*)		X			follow BMPs
2.5 included measures to avoid or minimize impacts to any fish, emergent vegetation or SAR identified on the site?		X			follow BMPs
2.6 applied the least risk timing windows?		X			work to be conducted during timing window of June 1-September 30
2.7 minimized the footprint of the works?		X			wood piles

2.8	considered one common lakeshore access on multiple lot sites?			X	site is single lot
2.9	maintained a 50 m lakeshore frontage between moorage structures on single lots?		X		docks on adjacent lots are <50 m away
2.10	minimized access related disturbance from machinery/equipment?	X			access by boat or barge
2.11	included measures to ensure no erosion or sediment releases result from proposed works?		X		minimal substrate disturbance will result from construction
3.0 MONITORING & REPORTING					
3.1	included provisions to ensure protective measures & BMPs are followed?	X			environmental monitoring at start-up
3.2	included provisions for monitoring to ensure the completed works function as expected over time?		X		not deemed necessary
3.3	provided recommendations for any impacts from future maintenance?		X		none anticipated
3.4	considered long term water quality issues?		X		none anticipated
3.5	reported new SAR occurrences to MOE Ecosystem Staff and CDC using CDC Field Observation Forms			X	no new SAR occurrences
3.6	reported null data for rare plant species to MOE Ecosystem Staff **(Osoyoos Lake Only)**			X	not Osoyoos Lake
4.0 LEGISLATIVE REQUIREMENTS					
4.1	avoided a HADD?	X			no spawning or critical habitat affected
4.2	received a letter of advice or authorization from DFO if the works do cause a HADD?			X	no HADD
4.3	conducted a RAR assessment for upland works? If yes, list RAR assessment # and indicate if the RAR assessment included provisions for foreshore access			X	No foreshore access required.

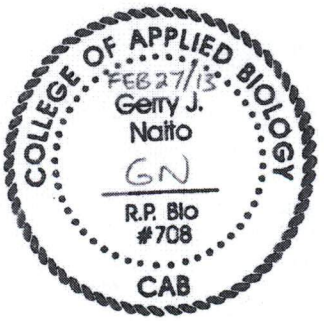
This development activity is in the following zone: Black Red (Yellow) No Colour

The development activity risk is Very High (High) Moderate Low

I confirm that all information provided in this checklist is to the best of my professional knowledge true and complete.

Gerry Naito

Original signature of Qualified Professional



Gerry Naito
Printed Name of Qualified Professional

RPBio #708 (BC College of Applied Biology)
Professional Association #

FEBRUARY 27, 2013
Date