Claridge Homes
Wurtemburg Street Condominium Development
Ottawa, Ontario

Prepared for:

Claridge Homes

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1.0 INTRODUCTION

Claridge Homes is initiating development of a condominium building on Wurtemburg Street in Ottawa. The development requires work on a soil slope into the Rideau River. In order to confirm compliance with the federal *Fisheries Act*, Claridge Homes has required a site visit and observations on fish habitat at the Wurtemburg Street development property. This report represents the observations made during this site visit.

2.0 DEVELOPMENT PLANS

Claridge Homes has plans for a condominium building on a property located in Wurtemburg Street. The property is adjacent to the Rideau River and slopes steeply into the river. The slope is comprised of soil and requires stabilization in order to avoid future erosion and potential slope failure.

The property foreshore potentially affected by slope stabilization aspects of the project extends over 17.3 meters along the Rideau River.

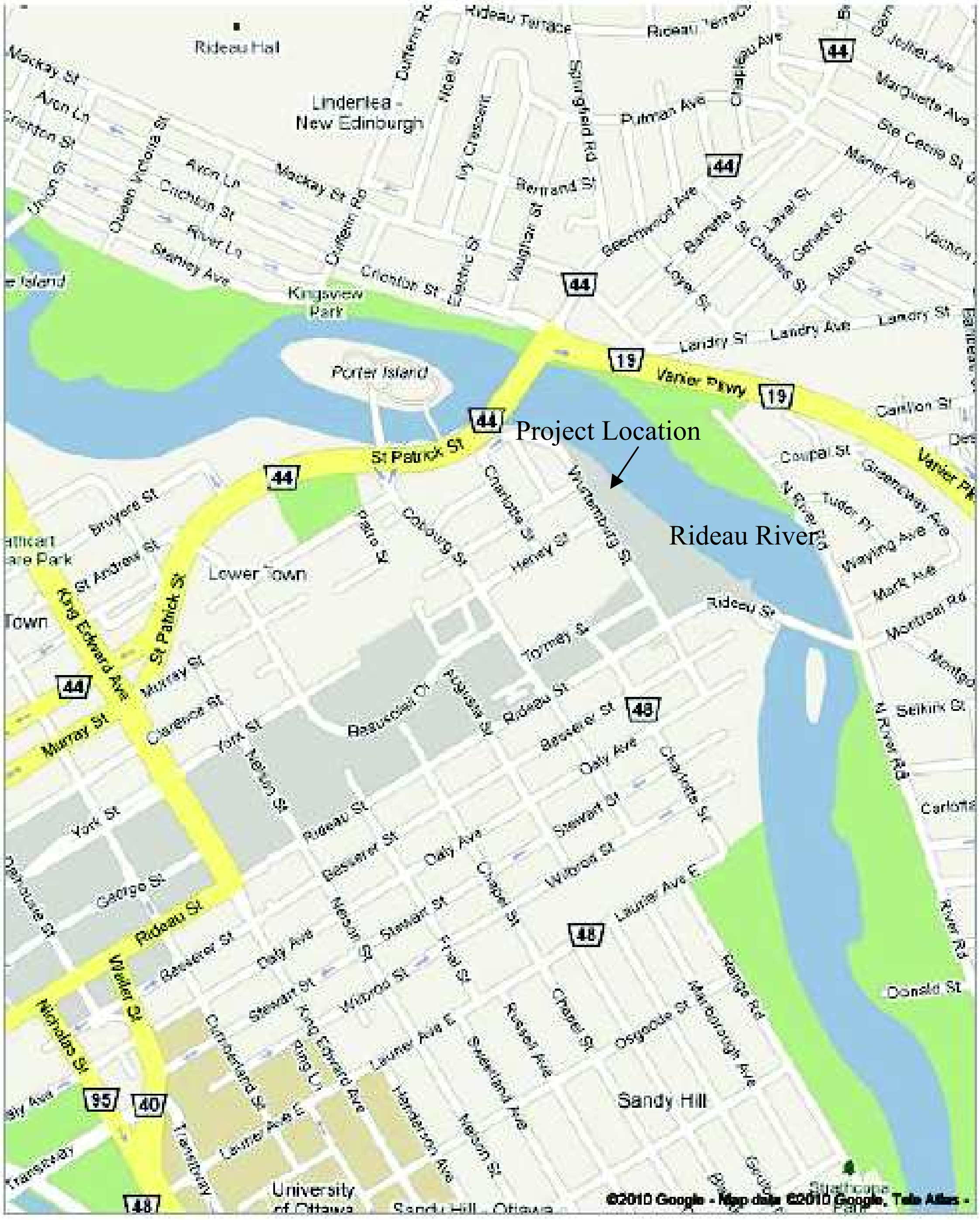

Figure 1. Location Map

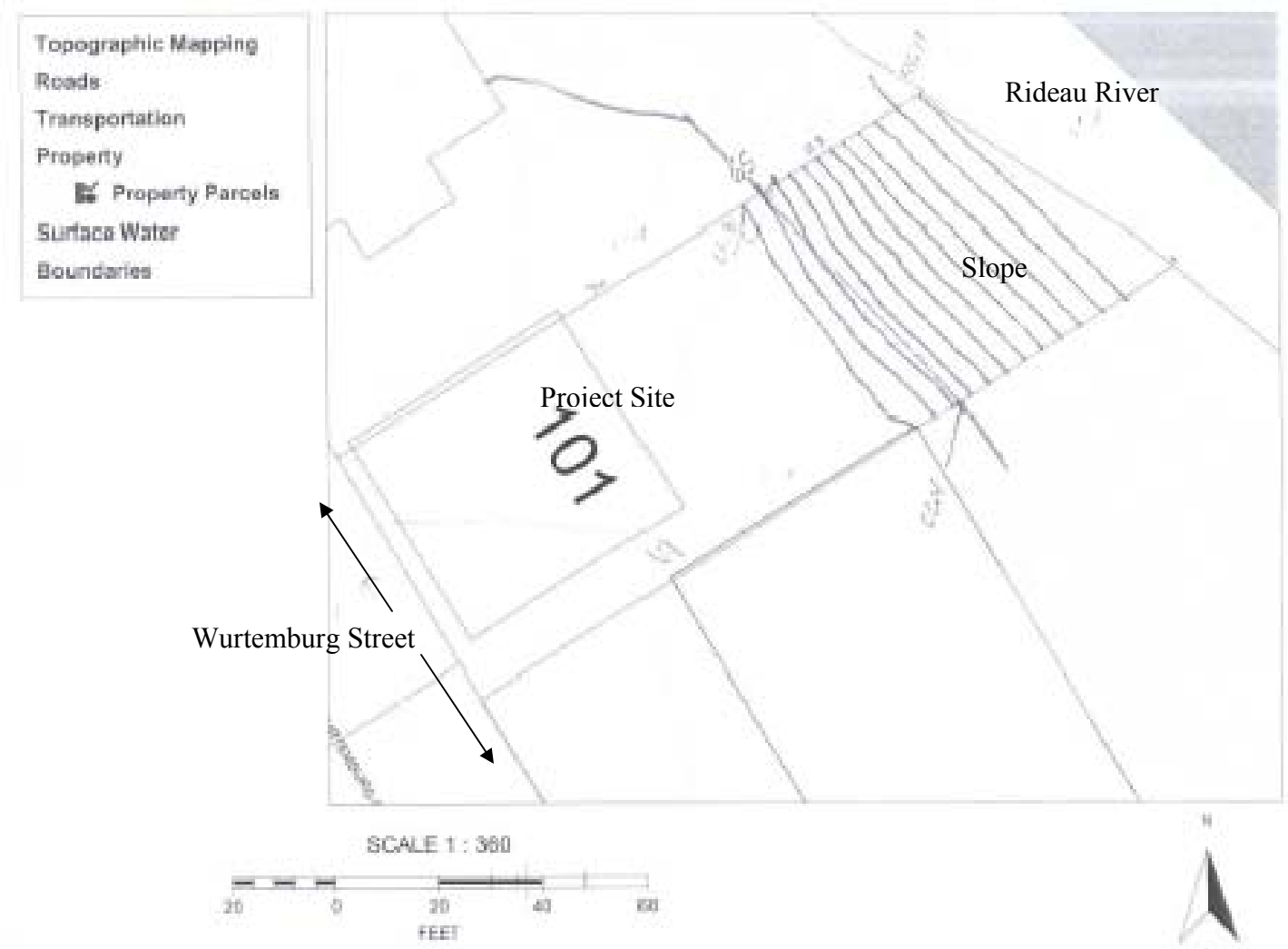

Figure 2. Project Site

3.0 SITE VISITS AND REPORTS

Mr. G. Packman made three visits to the site on February 21, March 25 and May 25, 2010.

The project location is depicted in Figure 1 and the layout of the property and shoreline are depicted in Figure 2.

4.0 SITE VISIT FINDINGS

4.1 February 21, 2010 Site Visit

A reconnaissance site visit was completed on February 21, 2010. During this site visit observations were made and photos were taken to characterize the site in relation to fish habitat.

4.1.1 Biophysical Characteristics

Photos 1, 2 and 3 in Appendix 1 depict the slope of the property and foreshore along the Rideau River on February 21, 2010. On the side adjacent to the Rideau River, the property slopes steeply toward the river as indicated in Photos 1 and 2. The slope is vegetated with trees and shrubs. Although it did not appear as though there was extensive ground cover, the ground was covered with snow on February 21, 2010 and this was difficult to confirm.

4.2 March 25, 2010 Site Visit

A reconnaissance site visit was completed on March 25, 2010, after the snow cover had disappeared. During this site visit, observations were made and photos were taken to characterize the site in relation to fish habitat.

4.2.1 Biophysical Characteristics

On the side adjacent to the Rideau River, the property slopes steeply toward the river. Photos 4 through 9 in Appendix 1 depict the slope of the property and foreshore along the Rideau River on March 25, 2010. Photos 9 and 10 provide overviews of the property and adjacent foreshore from the opposite bank of the Rideau River.

4.3 May 25, 2010 Site Visit

A reconnaissance site visit was completed on May 25, 2010, to augment the aquatic habitat information base. This site visit was completed in the morning on a sunny day, in order to improve visibility of habitat features below the surface, from shore. During this site visit, additional observations were made and photos were taken to characterize the site in relation to fish habitat.

4.3.1 Biophysical Characteristics

Photos 12 through 16 in Appendix 1 depict the Rideau River shoreline and shallow littoral zone along the property on May 25, 2010. From Photos 12, 13 and 16 it is apparent that the shoreline has a substantial component that is comprised of broken concrete and granular material. Photos 14 and 15 show the shallow littoral zone where the substrate is comprised of silty material. Some submergent aquatic vegetation and a minor amount of large woody debris were present.

The bottom, adjacent to the property appears to drop off relatively quickly, consistent with the slope of the shoreline.

Photos 9 and 10 provide overviews of the property and adjacent foreshore from the opposite bank of the Rideau River.

5.0 EXTENT OF FISH HABITAT FEATURES POTENTIALLY AFFECTED

Plans for stabilizing the slope are being finalized; however, conceptually work on the slope leading down to the Rideau River would be comprised of the following:

- Grading the slope to the angle required to ensure stability;
- Stabilizing the slope with rip-rap; and
- Stabilizing the toe of the slope at the Rideau River with rip-rap.

Rip-rap at the toe of the slope would extend approximately 2 meters into the littoral areas of the adjacent Rideau River for a distance of 17.3 meters. Approximately 35 square meters of fish habitat would be altered by the placement of rip-rap at the toe of the slope. Rip-rap would also be placed on the slope itself, meaning that existing vegetation would be removed. Trees would be planted along the toe of the slope, through spaces between the rip-rap.

6.0 SENSITIVITY OF FISH AND FISH HABITAT

The approximately 35 square meters of shoreline and littoral zone fish habitat represents a very small element of fish habitat in comparison to adjacent shoreline habitat and the adjacent full channel of the Rideau River. It was therefore concluded that direct fish species presence and abundance sampling would not likely add to existing knowledge of fish species present in a meaningful way. The Museum of Nature has a website that presents a list of species found in a biodiversity study for the reach extending from Hogs Back to Rideau Falls. This list is presented below in Table 1 and is considered likely to, if anything, contain more species than would be likely to be found using the littoral zone adjacent to the Wurtemburg property.

Table 1. Fish species reported in relevant section of Rideau River

Scientific Name	Common Name	Trophic Level	Hogs Back to Rideau Falls
Esox lucius	Northern Pike	Carnivore	✓
Esox masquinongy	Muskellunge	Carnivore	✓
Umbra limi	Central Mudminnow	Insectivore	✓
Cyprinus carpio	Common Carp	Insectivore	✓
Hybognathus hankinsoni	Brassy Minnow	Omnivore	✓
Luxilus cornutus	Common Shiner	Insectivore	✓
Notemigonus crysoleucas	Golden Shiner	Omnivore	✓
Notropis heterodon	Blackchin Shiner	Insectivore	✓
Notropis hudsonius	Spottail Shiner	Insectivore	✓
Notropis volucellus	Mimic Shiner	Insectivore	
Moxostoma anisurum	Silver Redhorse	Insectivore	✓
Moxostoma valenciennesi	Greater Redhorse	Insectivore	✓
Ameiurus nebulosus	Brown Bullhead	Omnivore	✓
Fundulus diaphanus	Banded Killifish	Insectivore	✓
Ambloplites rupestris	Rock Bass	Carnivore	✓
Lepomis gibbosus	Pumpkinseed	Insectivore	✓
Lepomis macrochirus	Bluegill	Insectivore	✓
Micropterus dolomieu	Smallmouth Bass	Carnivore	✓
Micropterus salmoides	Largemouth Bass	Carnivore	✓
Pomoxis nigromaculatus	Black Crappie	Insectivore / Carnivore	✓
Etheostoma olmstedi	Tessellated Darter	Insectivore	✓
Perca flavescens	Yellow Perch	Insectivore / Carnivore	✓
Percina caprodes	Logperch	Insectivore	✓
Aplodinotus grunniens	Freshwater Drum	Insectivore	✓
Cottus bairdi	Mottled Sculpin	Insectivore	✓
Elliptio complanata	Eastern Elliptio	Freshwater Mussel	✓
Lampsilis radiata	Eastern Lampmussel	Freshwater Mussel	✓

Source: Canadian Museum of Nature – Rideau River Biodiversity Project http://nature.ca/rideau/b/b2a-e.html#TrophicLevel (Accessed April 12, 2010)

Based upon the above information, the following analysis of fish and fish habitat sensitivity was completed in accordance with guidance developed by the Ontario Ministry of transportation (MTO) and Fisheries and Oceans Canada (DFO) (MTO 2009).

Table 2. Analysis of fish and fish habitat sensitivity

Attributes	Rideau River Littoral Zone Fronting the Property
Species Sensitivity	• The species documented in the relevant reach of the Rideau River are relatively common species that are evidently habituated and/or adapted to completing their lifecycle within a river that exists within an urban context. • These species are for the most part relatively tolerant of the types of changes associated with the proposed project. Some species may be displaced to a limited extent while others will take advantage of the new opportunities created by the cover and feeding opportunities provided by the habitat structure, interstices and hard substrate • The habitat changes that will result from the project will introduce new habitat structure that will provide increased surface area for periphyton and increased interstices and cover for aquatic invertebrates and forage fish that support the food chain.
Habitat Resiliency	• The shoreline habitat currently present at the site is a mix of broken concrete and related granular material, along with a mix of fine particle substrate and gravel, as indicated in Photos 6, 7 8, 12, 13 and 16 in Appendix 1. It can be seen from the photos that the gravel is fairly embedded. • The shallow littoral habitat is comprised of a sloping silty substrate (Photos 14 and 15), with some large woody debris present. • The Manitoba maples overhang the shoreline providing shade. There is virtually no understory. • Generally, along this section of river, the littoral habitat (Photos 10 and 11) is similar to that depicted in Photos 6, 7 and 8 in Appendix 1. The property immediately downstream has a concrete retaining wall however (Photo 10). • Golder Associates (2010) indicates that the existing bank is erosional and the slope is unstable. This was also noted in the site visits reported upon in this report. Placement of rip-rap is intended to correct this ongoing source of habitat alteration. • Structure provided by large woody debris can be replaced by rip-rap. If necessary, large woody debris could be placed with the rip-rap. • Overhanging vegetation can be replaced with appropriate species of shrubs.
Species Dependence on Habitat	• The species documented in the relevant reach of the Rideau River are relatively common species that are

	evidently habituated and/or adapted to completing their lifecycle within a regulated river that exists within an urban context. • The habitat changed by the project represents a very small proportion of habitat along this section of the Rideau River. • The habitat changes that will result from the project will introduce new habitat structure that will provide increased surface area for periphyton and increased interstices and cover for aquatic invertebrates and forage fish that support the food chain. • It is not apparent that the relevant habitat contributes in any unique or critical manner to the productive capacity of species found in this section of the Rideau River.
Rarity	• Generally, along this section of river, the littoral habitat (Photos 10 and 11) is similar to that depicted in Photos 6, 7 and 8 in Appendix 1. The property immediately downstream has a concrete retaining wall however (Photo 10). • The habitat changed by the project represents a very small proportion of similar habitat along this section of the Rideau River. The relevant habitat is not considered rare. • Species at risk were not identified in this section of the Rideau River.
Overall Sensitivity	• Overall, the proposed project will change only a small amount of habitat in relation to the existing habitat along the relevant section of the Rideau River. • This change will benefit some individuals and has the potential to displace. Net negative effects are not anticipated. The potential exists for net positive effects through habitat improvement and by addressing the eroding slope. • Overall sensitivity is considered to be very low.

7.0 MITIGATION

The following mitigation measures can be implemented to avoid and minimize project effects on fish habitat:

- Sediment and erosion controls will be implemented during construction to minimize and avoid the deposit of sediment into the Rideau River. These measures will be inspected regularly and maintained until such time as slope stabilization and re-vegetation are complete;
- The area affected by rip-rap placed along the shore and into the Rideau River will be minimized through engineering design;

- Overhanging vegetation will be included in the design and planted during project implementation to provide shade, cover, and a source of allochthonous food supply; and
- The toe of the slope will be designed to provide fish habitat structure and diversity to more than offset any potential loss in fish habitat productive capacity.

8.0 RISK ASSESSMENT

8.1 Scale of Negative Residual Effect

It is expected that the slope stabilization project will affect fish habitat extending up to 2m into the Rideau River along the 17.3m width of the property. This would result in the change and potential displacement of up to 34.6m^2 of fish habitat. The change would persist for the foreseeable future.

8.2 Sensitivity of Fish and Fish Habitat

As indicated in Table 2 above, overall sensitivity of the habitat affected by the project is considered to be very low. The species documented in the relevant reach of the Rideau River are relatively common species that are evidently habituated and/or adapted to completing their lifecycle within a river that exists within an urban context. These species are for the most part relatively tolerant of the types of changes associated with the proposed project. Some species may be displaced to a limited extent while others will take advantage of the new opportunities created by the cover and feeding opportunities provided by the habitat structure, interstices and hard substrate for aquatic invertebrates and forage fish that support the food chain.

The habitat currently present at the site is a granular mix of fine particle substrate and gravel, and the gravel is fairly embedded. The existing bank is considered erosional and the slope is unstable. Placement of rip-rap is intended to correct this ongoing source of habitat alteration. The habitat change resulting from the project represents a very small proportion of habitat along this section of the Rideau River. It is not apparent that the relevant habitat contributes in any unique or critical manner to the productive capacity of species found in this section of the Rideau River. The habitat changed by the project represents a very small proportion of similar habitat along this section of the Rideau River. The relevant habitat is not considered rare. Species at risk were not identified in this section of the Rideau River.

Overall, the proposed project will change only a small amount of habitat in relation to the existing habitat along the relevant section of the Rideau River. This change will benefit some individuals and has the potential to displace others. Net negative effects are not anticipated and overall habitat improvement is planned. Overall sensitivity is considered to be very low.

8.3 Risk Assessment Matrix

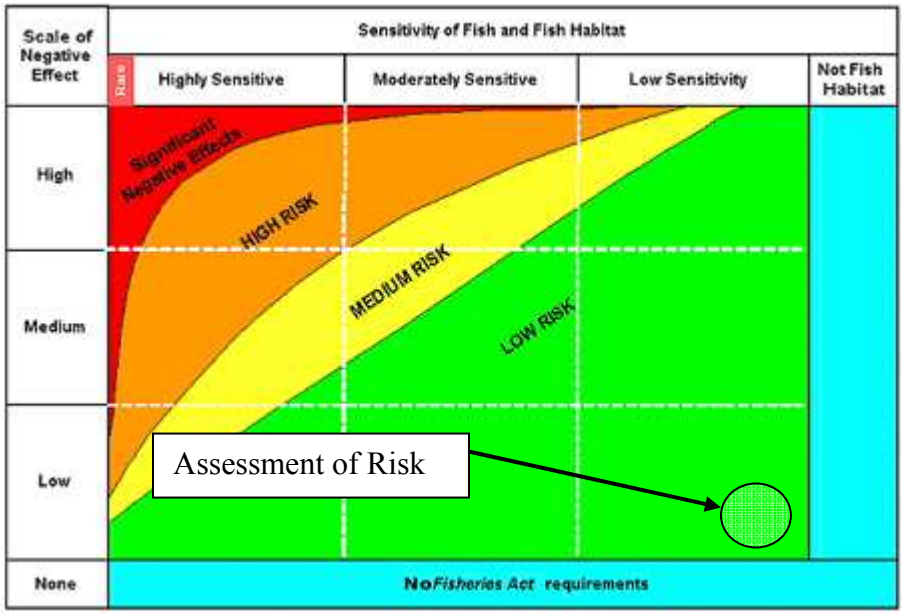

Figure 3. Assessment of risk using DFO Risk Matrix

9.0 CLOSING

This report has been prepared on the basis of information provided by Claridge Homes, along with information and photographs obtained from site visits completed on February 21 and March 25, 2010.

G.A. Packman & Associates

Original signed by:

Glen Packman
President

10.0 REFERENCES

Canadian Museum of Nature – Rideau River Biodiversity Project
http://nature.ca/rideau/b/b2a-e.html#TrophicLevel (Accessed April 12, 2010)

Golder Associates. 2010. Preliminary Results and Guidelines – Slope Stability Assessment 101 Wurtemburg Street, Ottawa, Ontario. Technical Memorandum from M. Cunningham (Golder) to J. Burghout (Claridge Homes), February 4, 2010.

APPENDIX 1 - PHOTOGRAPHS

Photo 1. View down slope to the Rideau River on February 21, 2010. The concrete abutment is the upstream extent of the development property.

Photo 2. View across the slope on February 21, 2010. The fence represents the top of the slope on the development property.

Photo 3. View along the Rideau River looking upstream from the upstream side of the development property, on February 21, 2010.

Photo 4. View down slope to the Rideau River on March 25, 2010. The concrete abutment is the upstream extent of the development property.

Photo 5. View along the foreshore of the Rideau River, looking downstream from the upstream side, on March 25, 2010.

Photo 6. Close-up of the littoral zone along the front of the property showing substrate and degree of embeddedness - March 25, 2010

Photo 7. Close-up of the littoral zone along the front of the property showing substrate, habitat structure and degree of embeddedness - March 25, 2010.

Photo 8. Close-up of the littoral zone along the front of the property showing substrate, habitat structure and degree of embeddedness - March 25, 2010.

Photo 9. View from the water looking upslope - March 25, 2010.

Photo 10. View of the property and adjacent shoreline from across the Rideau River - March 25, 2010.

Photo 11. View of the upstream shoreline from across the Rideau River - March 25, 2010.

Photo 12. Shoreline showing broken concrete that has been moving downslope toward the river – May 25, 2010.

Photo 13. Shoreline showing broken concrete and unconsolidated material that has been moving downslope toward the river. While the Manitoba maples provide overhead shade, the shoreline itself lacked riparian vegetation – May 25, 2010.

Photo 14. View of silty substrate in the shallow littoral zone – May 25, 2010.

Photo 15. View of silty substrate in the shallow littoral zone – May 25, 2010.

Photo 16. Riparian zone – May 25, 2010.

Photo 17. Eroding slope above the shoreline – May 25, 2010.