

**APPENDIX A**

**Shoreline Functional Analysis**

SHORELINE FUNCTIONAL ANALYSIS

DEP NRPA APPLICATION # L-24660-2B-B-N  
BELGRADE LAKES, MAINE

*OCTOBER 2009*

*Prepared by:*

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*Energy & Water Resource Consultants*

**SHORELINE FUNCTIONAL ANALYSIS  
BELGRADE LAKES, MAINE**

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## **SHORELINE FUNCTIONAL ANALYSIS BELGRADE LAKES, MAINE**

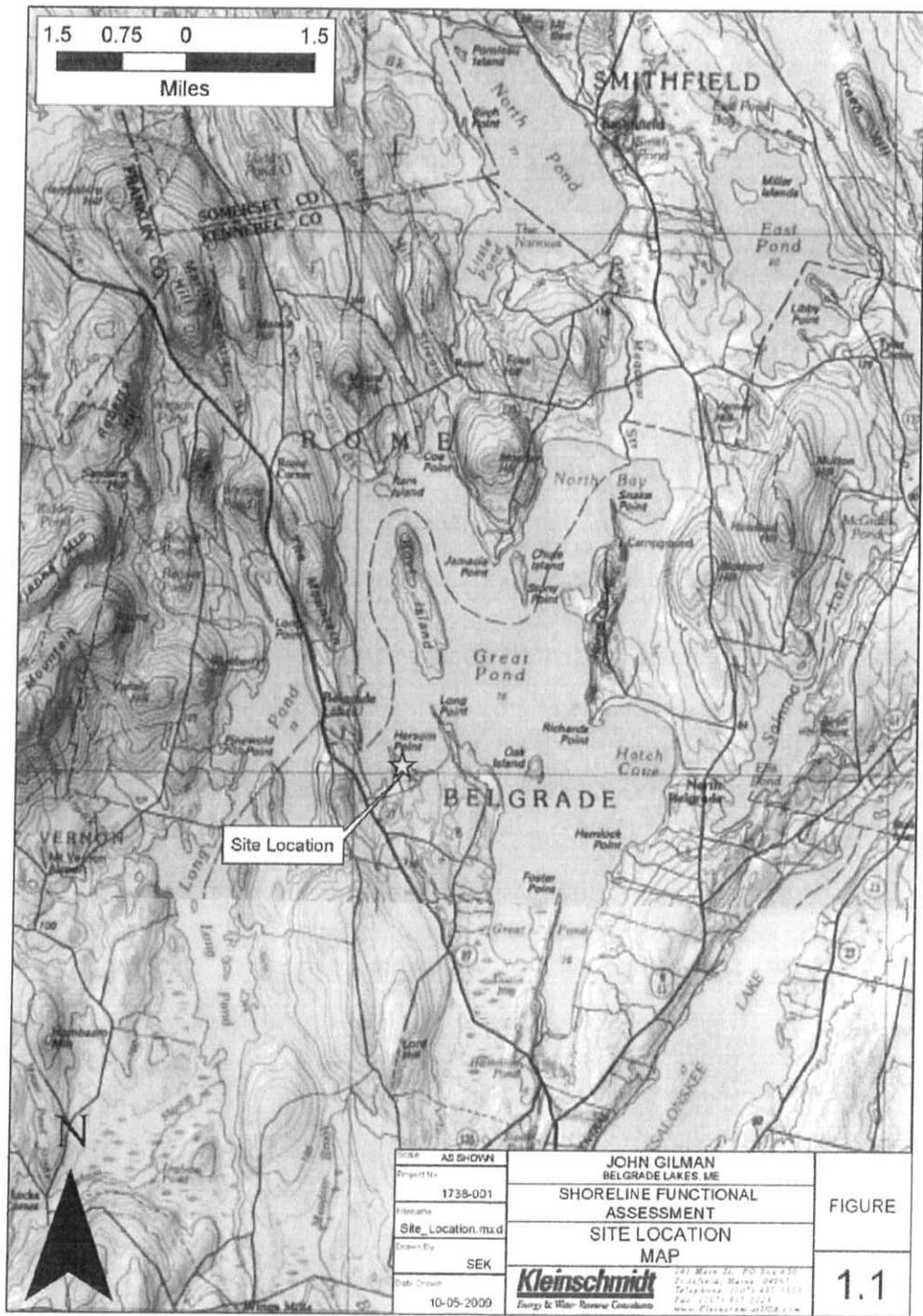
### ***1.0 INTRODUCTION***

Kleinschmidt Associates was retained by Mr. Gilman to complete a functional assessment at 87 Abena Shores Road, located on the southwest shore of Great Pond Lake, in the Town of Belgrade Lakes (Figure 1.1). The functional assessment was completed as per the requirements of the Maine Department of Environmental Protection (DEP) in a letter dated September 15, 2009 (Appendix A).

On October 2<sup>nd</sup> a Kleinschmidt biologist completed a site visit and functional assessment for the impact area. The area assessed was directly within the footprint of the boat lift as well as habitat adjacent to this area (used as a reference condition).

### ***2.0 METHODS***

A descriptive functional assessment of habitat at the above-mentioned location was completed. This assessment was based on the Army Corps of Engineers Highway Method (ACOE, 1995). This method utilizes a descriptive approach used to characterize primary functions and values provided by wetland habitats. Although no wetlands are present along the shoreline of the property, the riparian and littoral zones of the site were analyzed for functions and values.

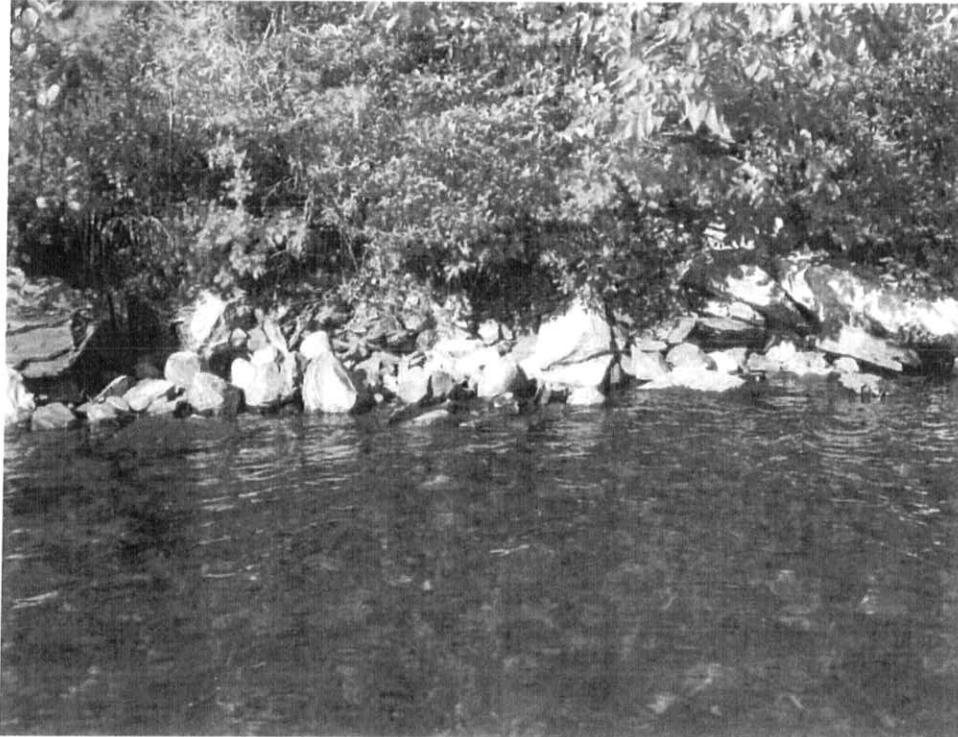


### **3.0 RESULTS**

The habitats located in the impact area and the immediate vicinity includes riparian habitat along the shoreline and the littoral habitat located on the lakeward side of the shoreline. No state protected wetlands, significant wildlife habitats, or essential wildlife habitats were identified. Below are results of the functional assessment completed for the riparian and littoral habitats identified at the site.

#### **3.1 Shoreline Habitat**

The immediate shoreline adjacent to the area of interest consists of a naturally armored bank comprised of boulders and large cobble (Photo Plate 1). Table 3.1 contains dominant species observed in the area of the boat lift; this list is also representative of the shoreline in the vicinity of this area. Shoreline vegetation consists mainly of shrubs (maleberry and high bush blueberry) with hemlock and occasionally white pine in the over-story. Herb layer vegetation along the shoreline was limited to the occasional goldenrod, aster, and often poison ivy (Table 3.1). The lack of herbaceous vegetation is most likely related to the dense mat of pine needles present. Generally, shoreline cover, provided by overhanging vegetation, was limited and consisted of shrub cover.



**Photo Plate 1: Representative Shoreline**

Table 3.1 Dominant shoreline and aquatic vegetation

<b>Scientific Name</b>	<b>Common Name</b>	<b>Stratum</b>
<i>Acer pensylvanicum</i>	stripped maple	Shrub/Tree
<i>Alnus incana</i>	speckled alder	Shrub
<i>Betula papyrifera</i>	white birch	Shrub/Tree
<i>Eriocaulon</i> sp	Pipewort	SAV*
<i>Ilex verticillata</i>	winterberry	Shrub
<i>Isoetes</i> sp	quillwort	SAV*
<i>Lyonia ligustrina</i>	maleberry	Shrub
<i>Osmunda cinnamomea</i>	cinnamon fern	Herb
<i>Pinus strobus</i>	white pine	Tree
<i>Prunus serotina</i>	black cherry	Shrub/Tree
<i>Quercus rubra</i>	red oak	Tree
<i>Solidago puberula</i>	downy goldenrod	Herb
<i>Spiraea latifolia</i>	meadow sweet	Shrub
<i>Symphotrichum lateriflorum</i>	calico aster	Herb
<i>Thalictrum pubescens</i>	tall meadow rue	Herb
<i>Toxicodendron radicans</i>	poison ivy	Herb
<i>Tsuga canadensis</i>	hemlock	Tree
<i>Ulmus americana</i>	American elm	Shrub/Tree
<i>Vaccinium corymbosum</i>	highbush blueberry	Shrub

\* Submerged Aquatic Vegetation

### 3.2 Littoral Habitat

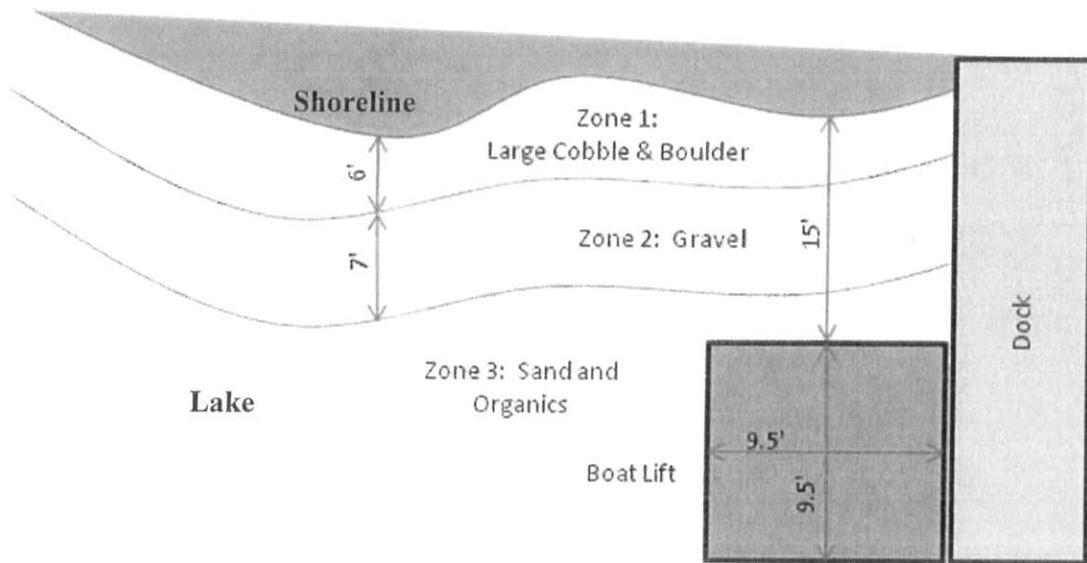
Littoral habitat was broken into three zones (Figure 3.2) based on the dominant substrate type. Zone 1 was immediately adjacent to the shore and consisted primarily of boulders and large cobble with sands and gravel occupying interstitial spaces (Photo Plate 2). This zone extended to six feet from the edge of water. Water depths for this zone, at the time of the visit, ranged from 0-12". No vegetation was observed within zone 1; this is most likely due to wave action as well as the absence of appropriate substrates.

Littoral Zone 2 was 7' wide and extended from the end of zone 1 out to 13' from the shoreline. It consisted of gravel with interstitial sands (Photo Plate 3). Water depths for this zone, at the time of the visit ranged from 12"-36". Vegetation within this zone was also sparse and when it occurred, was near the transition to zone 3.

Littoral Zone 3 began 13' from the shoreline (at the end of Zone 2) and was dominated by a layer (3-4") of fine substrate including silt and organics underlain by a layer of sand (Photo Plate 4). Scattered cobbles and patches of gravel were also present within this zone. Water depths within this zone, at the time of the visit, ranged 36-46". Vegetation was present within this zone, although sparse and patchy. Generally, aquatic vegetation was dominated by quilwort and pipewort.

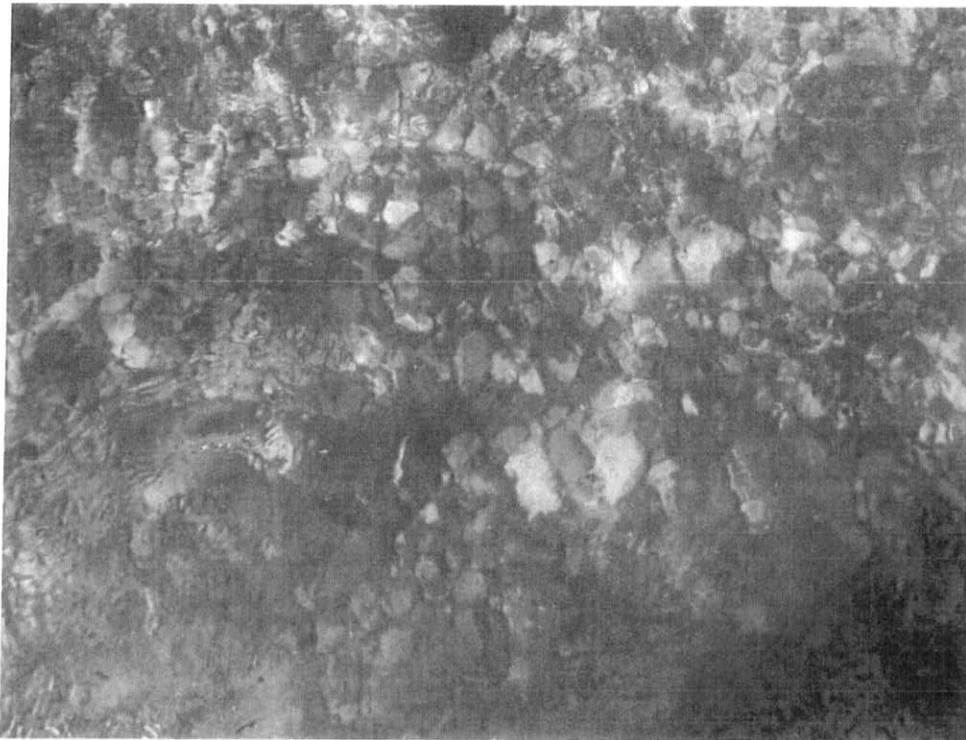
The entire littoral habitat within the vicinity of the Gilman site displayed the same zonation of habitat types. In general large woody debris was absent from the entire shoreline and littoral zones. There was occasional small woody debris (*i.e.*, branches) present, but not abundant. Submerged vegetation was also within all zones. Vegetation was most prevalent within zone 3, but was still sparse and patchy within this zone.

Figure 3.2 Habitat zones and approximate dimensions of lift (not to scale and distances are approximate)

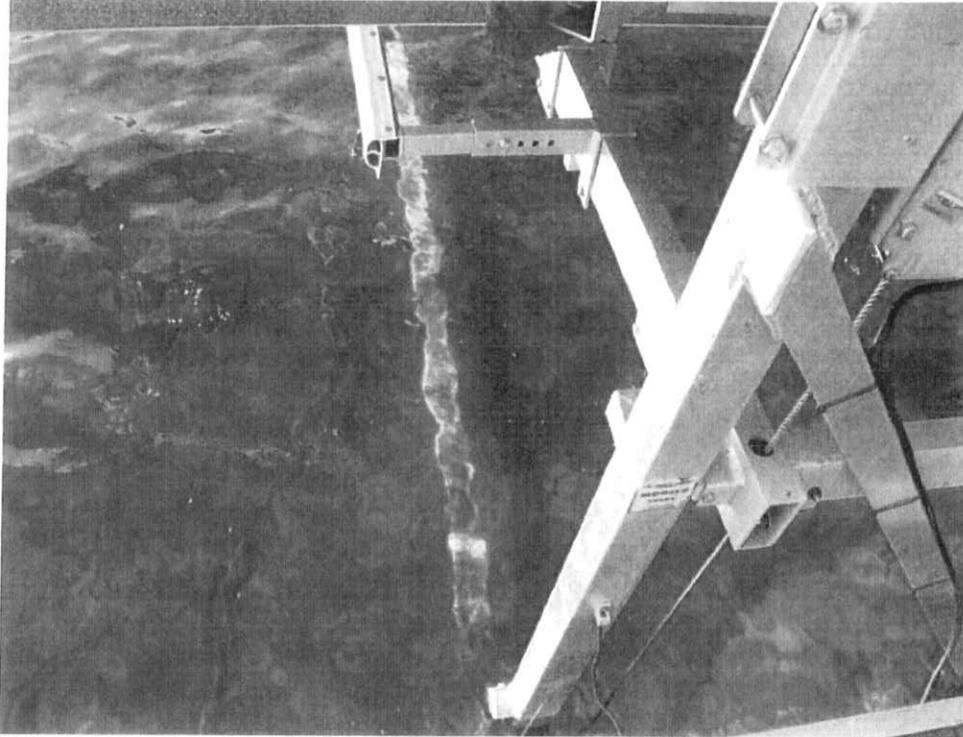




**Photo Plate 2:** Representative Habitat, Zone 1



**Photo Plate 3:** Representative Habitat, Zone 2



**Photo Plate 4:** Representative Habitat, Zone 3

### 3.3 Wildlife Observations

A qualitative survey for evidence of aquatic and terrestrial wildlife, including rare, endangered, or threatened (RTE) species, was completed during the visit. A number of freshwater mussel shells were collected within all zones. No live mussels were observed within the vicinity of the boat lift. Mussels collected were identified as eastern floater (*Pyganodon cataracta*) and eastern elliptio (*Elliptio complanata*). Both species of mussel found at the site are common in Maine. A species of water penny (Family *Psephenidae*), the aquatic form of the terrestrial beetle, was observed while over-turning substrate during the qualitative survey. No terrestrial wildlife, including RTE species, was observed during the survey; however, the shoreline contains a number of important shrubs used by a wide variety of wildlife.

### 3.4 Functional Analysis

Functions present within the shoreline zone and littoral zone are presented in Table 3.4. Primary functions of the habitat within the area impacted by the boat lift are Fish and Shellfish Habitat, Sediment and Shoreline Stabilization, Recreation, and Visual Quality (ACOE, 1995).

Table 3.4 Functions present within the impact area and vicinity

Function	Presence	Primary
Groundwater Recharge/Discharge	N	
Flood-flow Alteration	N	
Fish and Shellfish Habitat	Y	x
Sediment/Toxicant/Pathogen Retention	N	
Nutrient Removal/Retention/Transformation	N	
Production Export	Y	
Sediment/Shoreline Stabilization	Y	x
Wildlife Habitat	Y	
Recreation	Y	x
Education/Scientific Value	N	
Uniqueness/Heritage	N	
Visual Quality/Aesthetics	Y	x
Threatened or Endangered Species Habitat	Not observed*	

\*A determinate-level survey was not conducted to confirm presence or absence of threatened or endangered species; however, no RTE species were observed during the assessment.

#### **Groundwater Recharge/Discharge**

This function was not present in survey area.

#### **Flood-flow Alteration**

This function was not present in survey area.

#### **Fish and Shellfish Habitat – Primary**

The littoral zone provides an array of substrates utilized by both fish and shellfish. The presence of the eastern elliptio and eastern floater indicates a variety of habitat is present. The eastern elliptio is a habitat generalist occupying most water bodies in Maine. The eastern floater is also prevalent throughout the

State and while found in many habitats it generally prefers sandy or muddy substrates. Zones located within the impact area would be acceptable for both species mussel. The presence of boulder cover along with sandy areas makes the habitat suitable for smallmouth bass (*Micropterus dolomieu*), sunfish (*Lepomis auritus*), and fallfish (*Semotilus corporalis*). Transitioning further from shore, habitat may become more suitable for largemouth (*Micropterus salmoides*), sunfish (*Lepomis auritus*), yellow perch (*Perca flavescens*), and suckers (*Catostomus commersoni*).

#### **Sediment/Toxicant/Pathogen Retention**

This function was not present in survey area.

#### **Nutrient Removal/Retention/Transformation**

This function was not present in survey area.

#### **Production Export – Present**

The immediate shoreline contains a number of high value wildlife forage. Present within the riparian zone are a number of berry producing shrubs (highbush blueberry, winterberry, and maleberry) and other forage species (speckled alder and American elm) which all provide forage for a number of species, primarily bird species. While these plant species are present, the location is not suitable for many wildlife species due to extensive human development along the shoreline. Therefore, production export by wildlife is not considered a primary function.

#### **Sediment/Shoreline Stabilization – Primary**

The shoreline is naturally armored by boulders and cobbles. Additionally the shoreline is vegetated with shrubs and the presence of large hemlock and pine. This natural armoring serves an important function in preventing shoreline erosion and slumping of banks.

**Wildlife Habitat – Present**

While terrestrial wildlife habitat is present in the form of a riparian zone with shrub and tree cover, the presence of development minimizes the importance of this function.

**Recreation – Primary**

As one of Maine's inland waters, the site has high recreational value as a number of recreational activities could be conducted in proximity to the site (i.e., fishing, boating, snowmobiling, etc).

**Educational/Scientific Value**

This value is not present within the impact area.

**Uniqueness/Heritage**

This value is not present within the impact area.

**Visual Quality/Aesthetics – Primary**

The location of this area, the shore of Great Pond, makes the scenic quality of the shoreline zone important to both residents and visitors of the lake. This is a primary benefit derived from this shoreline.

**Threatened or Endangered Species Habitat – None observed**

No rare, threatened, or endangered species were observed within the area of impact; however, a determinate-level survey to confirm presence or absence was not part of the scope of this project.

#### **4.0 DISCUSSION AND CONCLUSIONS**

No wetlands, significant wildlife areas, or essential wildlife habitats are located at the area of impact; however, Great Pond is a protected natural resource per the Natural Resource Protection Act. The area of littoral habitat impacted by the boat lift is approximately 90.3 square feet (9.5' x 9.5'). This area takes into consideration portions of the substrate shaded by the boat canopy. Actual contact with the substrate is limited to the four support beams (approximately 6" square each). Based on comparison with adjacent littoral habitat, excavation used to install the lift was minimal, if used at all, and there is no evidence of habitat damage.

The boat lift has minimal affect on the function and values of the habitats in the impact area and vicinity. The boat lift may slightly reduce SAV growth, a component of fish and shellfish habitat, as a result of shading and boat activity. However, SAV and emergent vegetation is sparse in the general area and therefore this reduction would be limited. There is potential that the lift may provide aquatic cover and habitat structure in place of naturally occurring object cover since the existing shoreline lacks substantial amounts of large woody debris or other cover sources. Shoreline stabilization functions are not impacted by the presence of the lift. The naturally armored bank does not appear to have been modified during the installation of the lift. The lift was installed approximately 15' from the shoreline and does not intersect the shoreline. Natural armoring continues to prevent erosion. Recreational functions may be affected as the lift is installed throughout the year. This impact would be primarily during the winter months when other docks/devices are normally removed. Currently, an aerator is used to keep the structure free of ice during the winter, which may affect the use of this area for snowmobiling or other recreational activities. Visual quality is impacted by the year around presence of the lift and canopy.

**5.0 REFERENCES**

Army Corps. of Engineers (ACOE). 1995. The Highway Methodology Workbook: Wetland Functions and Values. 32 Pp.

Nedeau, E.J., M.A. McCollough and B. I., Swartz. 2000. The Freshwater Mussels of Maine. Maine Department of Inland Fisheries and Wildlife, Augusta. 107 Pp.

APPENDIX A  
CORRESPONDENCE

STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI

GOVERNOR

September 15, 2009

John A. Gilman  
P.O. Box 488  
Hope Valley, RI 02832

DAVID P. LITTELL

COMMISSIONER

**RE: DEP NRPA Application #L-24660-2B-B-N, Belgrade**

Dear Mr. Gilman,

Your application for the above referenced permit was received by the Department of Environmental Protection on August 20, 2009. The application was found to be acceptable for processing on September 14, 2009, and has been given the above referenced number. Please refer to this number in any future correspondence.

The project is now being examined to determine whether a license can be issued. The statutory deadline for the Department to reach a final decision is January 12, 2009; however, the Department will process this application and reach a final decision as quickly as possible. No construction activities at this project site may be started prior to receiving a final decision from the Department.

Please be advised that the Department is unlikely to grant a permit for a permanent structure in a great pond. Permanent structures are considered to result in unreasonable impacts to the resource because they can be avoided in virtually every case by using an alternative: the utilization of a temporary or seasonal structure. The Department does not consider safety or public health issues as factors when determining whether a proposed project represents a reasonable impact on a resource. Your proposal is likely to be denied based upon freshwater habitat considerations and the availability of an alternative to the proposed project that is less environmentally damaging. Further, after discussing the project with the Department's Shoreland Zoning Coordinator, it has been determined that the proposed project is not acceptable according to Chapter 1000, State of Maine Shoreland Zoning Guidelines, because the project is considered an expansion of an existing structure in the shoreland zone. For these reasons, I strongly encourage you to withdraw your application and use your boat lift strictly on a temporary or seasonal basis.

In accordance with the Department's Wetland and Waterbodies Rules in Chapter 310, the Department requires that you submit a functional assessment on the resource area where impact has occurred no later than October 15, 2009. This assessment must be completed by a qualified professional wetland scientist. The functional assessment must include an analysis of the functions and values of the resource and how the resource how/will be affected by the proposed alteration.

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## PRESQUE ISLE

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STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI  
GOVERNOR

DAVID P. LITTELL  
COMMISSIONER

Please feel free to contact me at (207) 287-7898 or via email at [Beth.Callahan@maine.gov](mailto:Beth.Callahan@maine.gov) if you have any questions regarding this project.

Sincerely,

Beth Callahan, Project Manager  
Division of Land Resource Regulation  
Bureau of Land & Water Quality

cc: File

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