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June 22, 2017
Project Number 17029

Ripple Design Studio
4303 Stone Way North
Seattle, Washington 98103

Attention: Jeff Almeter

Regarding: **Critical Area Study: Wetland & Watercourse Buffer Reduction**
East Mercer Development
8375 + 8383 East Mercer Way – Mercer Island, Washington

Dear Jeff:

At your request, this critical area study has been prepared to describe wetland and watercourse buffer reductions proposed for a three lot residential development project located at approximately 8375/8383 East Mercer Way.

PROJECT SITE

The project site is located on the southeast side of Mercer Island near the intersection of East Mercer Way and Avalon Drive. The project site measures 58,373 sf (1.34 acres) in total area and includes the following three residential lots that were created through the "Run Yong USA" lot line revision (Mercer Island Lot Line Revision File No. SUB 16-004):

- Parcel A - Tax Parcel No. 032110-0145; 8375 E. Mercer Way; 15,683 sf (0.36 acres)
- Parcel B - Tax Parcel No. 032110-0140; 8383 E. Mercer Way; 16,638 sf (0.38 acres)
- Parcel C - Tax Parcel No. 032110-0141; 26,053 sf (0.60 acres)

Parcel A and Parcel B are developed residential lots that maintain street frontage on East Mercer Way. Parcel C is an undeveloped lot located behind Parcel A and Parcel B.

Single-family residences currently exist on Parcel A and Parcel B in the approximate central portion of the larger project site. The residences are two-story structures constructed in the early 1960's. Areas surrounding the residences comprise mature tree and shrub landscaping, patios, paths, a large asphalt sport court, and lawn. Moderately steep slopes exist in the approximate western 1/3 of the site as well as along East Mercer Way. The sloped areas located in the western 1/3 of the site support an upland deciduous forest. The sloped areas along East Mercer Way support primarily non-native invasive shrub and vine species. A man-made pond exists in the north-central portion of the site.

CRITICAL AREAS

In 2014, The Watershed Company[1] completed a "Wetland and Watercourse Delineation Study" that

[1] The Watershed Company. 2014. Letter to Max Chau regarding 8375 and 8383 East Mercer Way, Wetland and Watercourse Delineation Study. The Watershed Company Reference Number 140618. August 1, 2014.

covered the project site. The study was completed prior to the 2016 short plat, but encompassed the three lots that comprise the project site. As a result of this work, a small wetland (referred to in text as "Wetland A") and narrow stream (referred to in text as "Watercourse A") were identified in the north-central portion of the project site.

Wetland A

Wetland A is an excavated two-cell landscape pond located on Parcel A and Parcel C. The two cells within the wetland are separated by a small constructed island. The upper cell of the pond is dominated by a dense stand of small fruited bulrush (*Scirpus microcarpus*). The lower cell of the pond supports dense stands of both creeping spikerush (*Eleocharis palustris*) and mannagrass (*Glyceria* sp.) as well as areas of open water. Common lady fern (*Athyrium filix-femina*), soft rush (*Juncus effusus*), creeping buttercup (*Ranunculus repens*), an ornamental iris, and Himalayan blackberry (*Rubus armeniacus*) are present along the pond margins. Wetland A was rated by The Watershed Company as a Category IV wetland. A 35 foot buffer is required from the delineated limits of Wetland A.

Watercourse A

Watercourse A is a narrow stream that drains north and east from Wetland A. Within the project site, Watercourse A exists only on Parcel A. Watercourse A was classified by The Watershed Company as a Type 2 watercourse. A 50 foot buffer is required from Watercourse A.

PROPOSED PROJECT

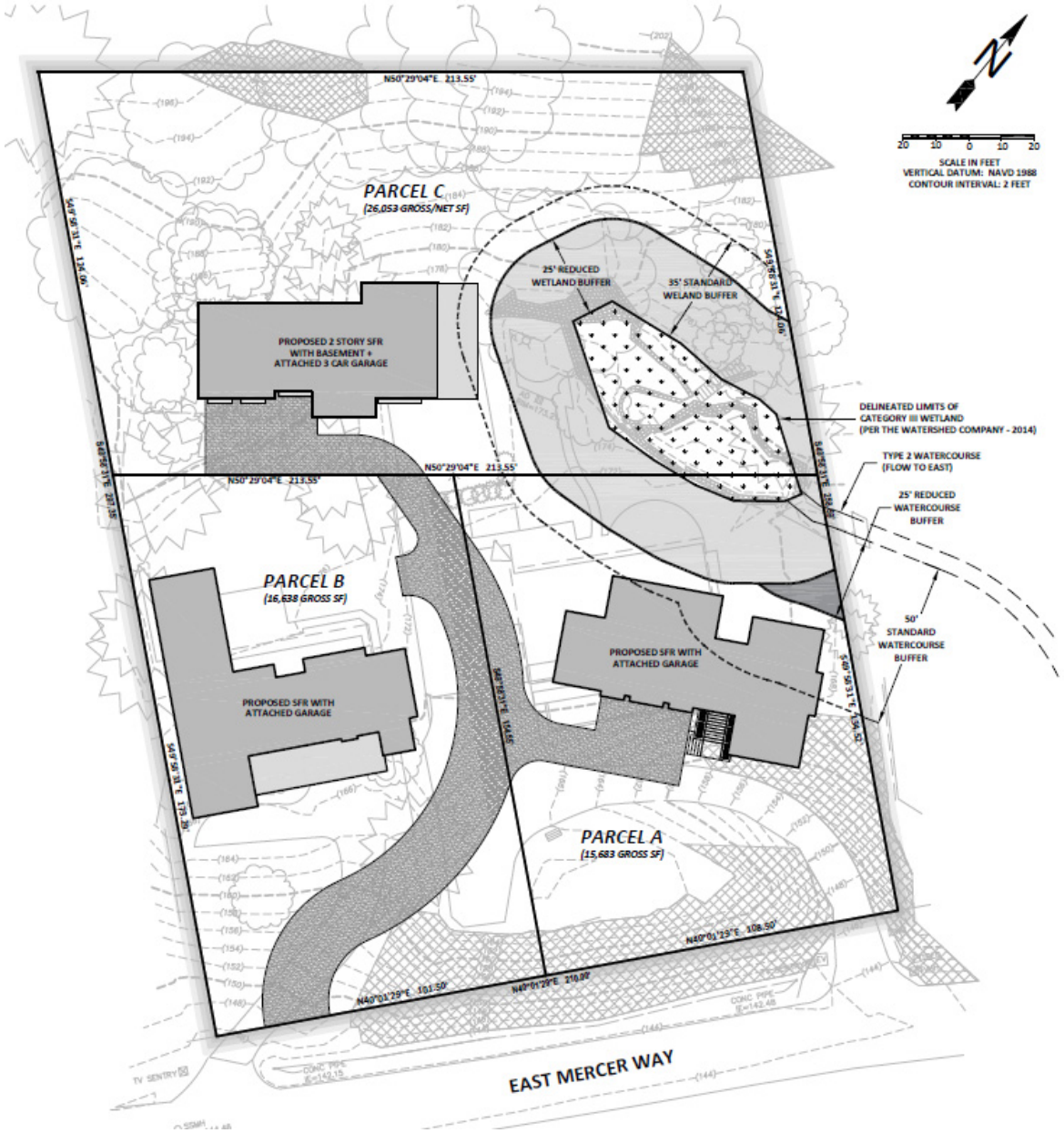
The proposed project includes the demolition of the existing single-family residences, driveways, and related improvements that currently exist within the project site. A new single-family residence will then be constructed on each of the three parcels. Access to the new residences will be provided by a shared driveway that originates from East Mercer Way on Parcel B. The proposed project is shown in Figure 1 (next page).

The purpose of the proposed project is to re-develop the project site for single-family residential use by replacing the outdated residences and constructing a new residence on Parcel C. The overall goal of the project is to improve each parcel in a similar scope and scale to that of other properties within the local area while at the sometime providing vehicular access to Parcel C. The new residences will be 2 story structures with attached garages that have all the essential components of a modern-day residence.

Development opportunities within the project site are constrained by the combination of relatively small lot size(s), topography, and the presence of critical areas (Wetland A, Watercourse A, steep slopes). The proposed project results in a consolidated development envelop for each parcel, removes non-conforming structures and improvements that are currently located within critical area buffers, and provides for the enhancement of degraded critical area buffers.

To accommodate the proposed site development, the standard wetland buffer will be reduced to 25 feet and the standard stream buffer will be reduced to 25 feet. A 5 foot building setback will be provided from the outer limits of the reduced buffer. The proposed buffer reductions are the minimum necessary to accommodate the proposed development and the reduced buffers conform to the minimum width established in Mercer Island City Code (MICC) 19.07.

Figure 1 – Site Plan



PROPOSED MITIGATION

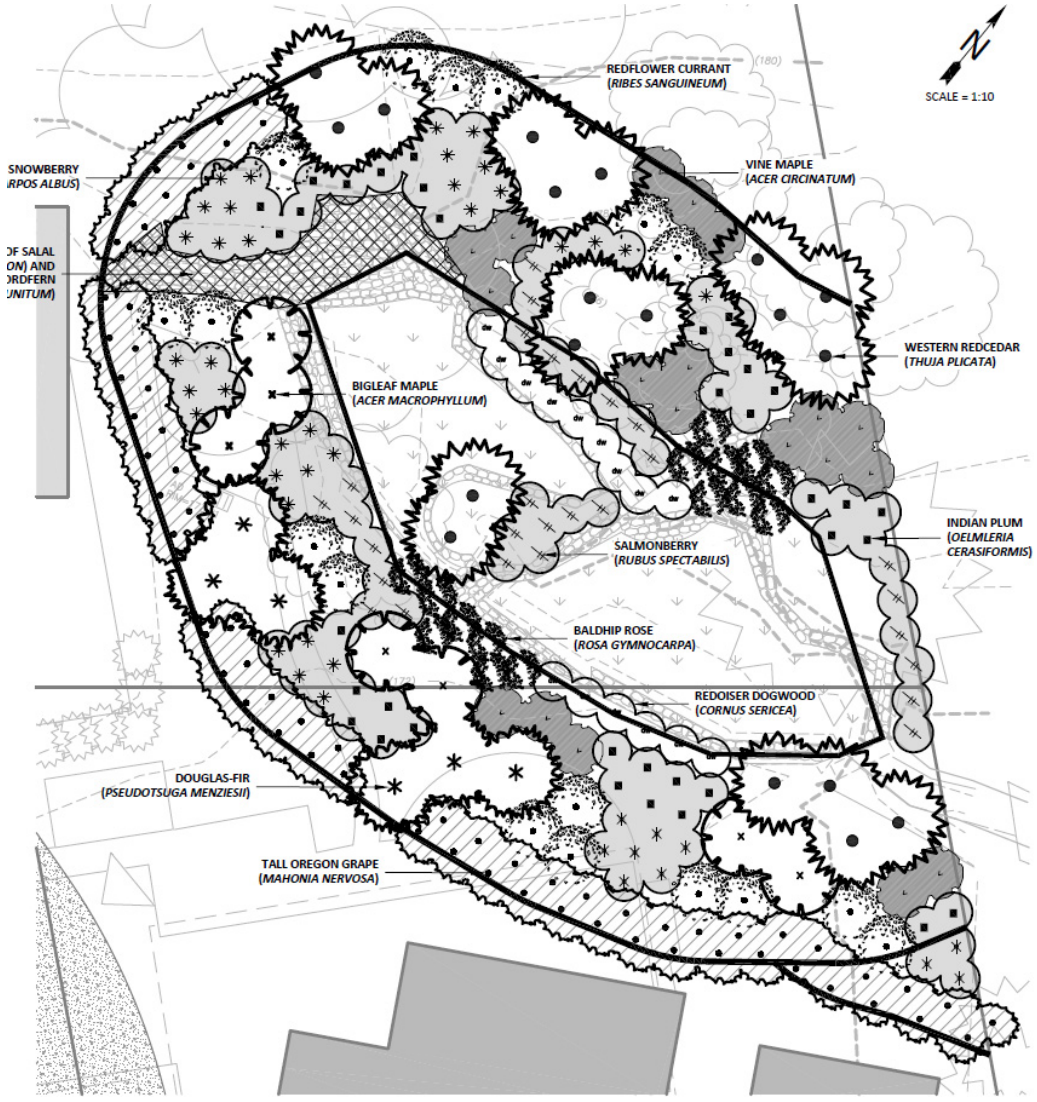
As part of the proposed project, the reduced buffer will be enhanced using native trees, shrubs, and groundcovers. The overall mitigation goal and objective is to enhance buffer functions by providing a dense, structurally diverse, and species rich native plant community within the reduced buffer area. Specific mitigation work includes the following:

- **<u>Remove existing surface improvements</u>**: Existing patios, walkways, a wood gazebo, and related improvements will be removed from the reduced buffer.

- **Remove non-native plants and noxious weed species:** Existing ornamental (landscape) shrubs and trees as well as noxious weeds will be removed from the reduced buffer.
- **Soil amendments and mulches:** Existing soils within the reduced buffer will be decompacted and then amended using organic compost. Mulch will be placed throughout the reduced buffer following plant installation.
- **Dense native plants:** Proposed mitigation plantings include 350 total plants comprising 3 tree species, 8 shrub species, and 2 groundcover species.
- **Temporary irrigation:** Two years of temporary irrigation will be provided to ensure installed plants are properly established.
- **Maintenance and Monitoring:** A five-year maintenance and monitoring program is included to ensure the mitigation performs as designed.

The proposed planting plan is shown in Figure 2

Figure 2 – Proposed Planting Plan



BUFFER FUNCTIONAL LIFT

Mercer Island City Code 19.07.070.B.2 and 19.07.080.C.2 requires that watercourse and wetland buffer reductions result in no net loss of buffer functioning. This section presents an analysis of existing buffer functioning as well as how the proposed buffer reduction results in a net increase in buffer functioning when compared to existing conditions.

The wetland and watercourse buffers located within the project site are highly modified, include various impervious surface improvements, and contain a wide variety of non-native vegetation.

Buffer areas located south and east of Wetland A include a portion of the residence located on Parcel A, an associated concrete patio/walkway, a wood gazebo, and an unmaintained lawn area comprising bentgrass (*Agrostis* sp.), bird's-foot trefoil (*Lotus corniculatus*), and clover (*Trifolium* sp.). A large English laurel (*Prunus laurocerasus*) also exists along the northeast property line of Parcel A.

Buffer areas located north and west of Wetland A include a large diameter bigleaf maple (*Acer macrophyllum*) and a large diameter western redcedar (*Thuja plicata*). The remaining vegetation within the buffer is a mix of non-native trees and tall shrubs including arborvitae (*Thuja occidentalis/orientalis*), apple (*Malus* sp.), rhododendron (*rhododendron* sp.), juniper (*Juniperus* sp.), English holly (*ilex aquifolium*), and calmellia (*Camellia* sp.). A small patch of unmaintained bluegrass (*Poa* sp.) lawn exists along a gravel path that crosses the buffer and a stand of giant horsetail (*Equisetum telmateia*) exists near the northern property line.

Vegetation on the small island within Wetland A includes a small red maple (*Acer rubrum*), a small pine tree (*Pinus* sp.), western swordfern (*Polystichum munitum*), and soft rush.

The presence of dense non-native plants within the buffer limits available forage and breeding habitat for wildlife and contributes to a cumulative reduction in animal species richness and abundance within the local area. On-site buffers also provide a significant seed source in the local area from which dispersal vectors can expand the presence of non-native plant species within and beyond the project site. The presence of man-made structures, imperious surfacing, and lawn within the buffer increases surface water runoff rates and prevents the infiltration of surface water. The vegetation within the buffer does not provide critical screening functions that can limit human intrusion and filter out noise, light, and movement generated by the developed portions of the project site.

With enhancement, the reduced wetland and watercourse buffer can provide seasonal foraging opportunities and escape cover for small mammals and passerine birds accustomed to urbanized environments. In addition, enhancement can improve hydroperiod and base flow functioning by increasing the surface water infiltration capabilities of the reduced buffer. Similarly, enhancement of the reduced buffer can increase water quality functions by providing the physical structure required to filter nutrients and toxics in stormwater. Finally, enhancement of the reduced buffer can significantly improve buffer screening functions by presenting a dense multi-layered natural vegetation barrier that currently does not exist within the buffer.

Table 1 (next page) presents a summary of the "functional lift" provided by the proposed project.

TABLE 1 – CRITICAL AREA BUFFER FUNCTIONAL LIFT ANALYSIS

BUFFER FUNCTION	EXISTING CONDITIONS	AFTER ENHANCEMENT	EXPECTED FUNCTIONAL IMPROVEMENT
Hydroperiod Maintenance / Base Flow Support	Limited potential to provide function due to vegetative conditions, the presence of impervious surfacing, and compacted soils.	Increased potential to provide function because impervious surfacing and lawn will be removed, soils will be decompacted/amended, and dense native planting will be installed.	**Improved**. Proposed enhancements improve function by providing the physical structure required to infiltrate stormwater runoff that flows towards the wetland/watercourse.
Water Quality Improvement	Limited potential to provide function due to vegetative conditions and compacted soils with limited to no duff layer.	Increased potential to provide function because soils will be decompacted/amended and dense native planting will be installed. Removal of existing lawn and landscaping within buffer reduces potential for chemical use near wetland/stream.	**Improved**. Proposed enhancements improve function by providing the physical structure required to filter nutrients/toxics in stormwater runoff that flows towards the wetland/watercourse.
General Wildlife Habitat Suitability	Low potential to provide function due to the presence of structures, impervious surfacing, and extensive non-native plant species.	Significant increase in potential to provide function because impervious surfacing, structures, and lawn will be removed, soils will be decompacted/amended, and dense native planting will be installed.	**Significantly Improved**. Proposed enhancements significantly improve function by providing a dense, structurally diverse, and species rich native plant community that currently does not exist.
Screening from Adjacent Disturbance	Low potential to provide function because buffer is a highly modified non-native landscape that includes lawn, concrete, and other improvements.	Significant increase in potential to provide function because dense multi-layered native planting will be installed.	**Significantly Improved**. Proposed enhancements significantly improve function by providing a screening barrier between development and wetland/watercourse that currently does not exist.

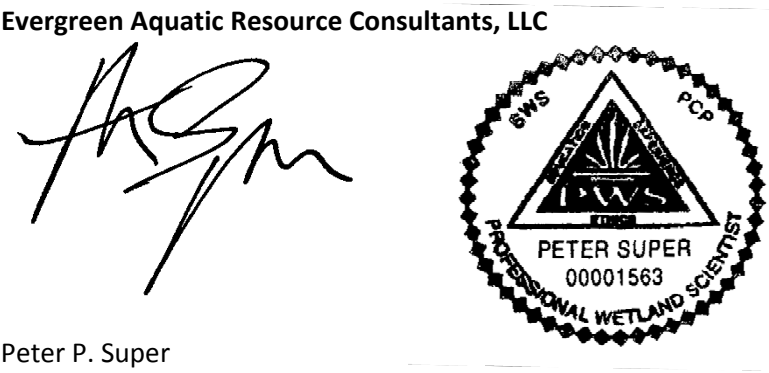
CONCLUSIONS AND CLOSURE

The proposed buffer reduction associated with the 3 lot East Mercer Way development project results in the permanent preservation and protection of a Category IV wetland and a Type 2 watercourse. The project conforms to the minimum buffers widths established in MICC 19.07 and provides for the enhancement of degraded buffer areas thereby improving overall buffer functioning. The project removes existing non-conforming improvements as well as non-native plant species, improves existing soil conditions, and requires the installation of dense native plantings. A five year maintenance and monitoring program will ensure the project achieves the required buffer functional improvement.

I trust that this study meets your present needs. If you have any questions regarding the information presented in this study or require additional assistance with this project, please do not hesitate to call me at (425) 677-7166 or email me at psuper@evergreenarc.com.

Sincerely,

Evergreen Aquatic Resource Consultants, LLC



Peter P. Super

Professional Wetland Scientist

Attachments:

Attachment 1 – Site Photographs

Photo 1 – View of Upper Landscape Pond Cell within Wetland A
Date: June 7, 2017

Photo 2 – View of Lower Landscape Pond Cell within Wetland A
Date: June 7, 2017

Photo 3 – Existing Buffer Conditions Located East of Wetland A
Date: June 7, 2017

Photo 4 – Existing Gazebo located in Wetland Buffer
Date: June 7, 2017

Photo 5 – Existing Buffer Conditions Located West of Wetland A
Date: June 7, 2017

Photo 6 – Gravel Path Located West and South of Wetland A
Date: June 7, 2017